Investigating cognitive and ontological factors underlying the adherence to normative materialistic values and their influence on wellbeing.

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I, Brad Elphinstone, declare that this thesis:

1) Contains no material which has been accepted for the award of any other degree or diploma, except where due reference is made in the text of the examinable outcome;

2) To the best of my knowledge contains no material previously published or written by another person except where due reference is made in the text of the examinable outcome; and

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Abstract

This thesis comprises three studies which aimed to investigate the cognitive and ontological factors that may contribute to placing importance on intrinsic or extrinsic aspirations, and their indirect relationship with wellbeing due to factors such as regulation and self-esteem. The first study \((N = 397)\) indicated that older respondents and those with an epistemic orientation towards complex (i.e., Intellective Processing) rather than expedient, effortless (i.e., Default Processing) thinking, tended to place more importance on intrinsic compared to extrinsic aspirations, were less materialistic, more autonomous in their regulation, resulting in greater self-esteem and wellbeing. The second study \((N = 231)\) commenced an exploration into holistic (i.e., a perspective which considers all things as being related, dynamic, and defined by context) and mechanistic (i.e., an atomistic perspective which sees things as being separate and static, emphasising external, quantifiable outcomes) ontological perspectives. In addition to increased age and a focus on Intellective Processing, higher levels of holism were associated with increased nonattachment (i.e., accepting the flow of events in life without judgement), placing more importance on intrinsic than extrinsic aspirations, reduced materialism, and greater autonomous regulation, self-esteem, self-actualization, and wellbeing. The third study \((n = 302, n = 142, n = 154)\) aimed to further investigate holistic and mechanistic thinking. Retrospective accounts of one’s parents as being authoritarian were associated with reduced holism (i.e., greater mechanism), leading to a greater focus on extrinsic aspirations, controlled regulation, lower self-esteem, and reduced wellbeing. Authoritarian, permissive, and authoritative parenting styles were directly associated with placing more importance on extrinsic than intrinsic aspirations, suggesting that within a consumer culture, all parenting styles may promote a focus on extrinsic aspirations. Higher levels of holism however, were indirectly associated with greater wellbeing due to placing more importance on intrinsic compared to extrinsic aspirations, leading to greater levels of autonomous regulation, and subsequently higher levels of self-esteem and wellbeing. Overall,
the results from the three studies replicate existing research by suggesting that extrinsic aspirations and materialism contribute to reduced wellbeing. Importantly, the findings contribute the novel finding that holism may indirectly promote psychological wellbeing as a result of the aspirations that people choose to place importance on.
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Chapter 1: Overview

The aim of this thesis is to examine the ways in which people look at the world, and how this influences the types of goals and aspirations they choose to place importance on in life. A particular focus will be on extrinsic aspirations (e.g., wealth, image, popularity) and consumer materialism. Furthermore, the reasons why these goals are pursued, and how these factors influence wellbeing will be investigated. The importance of doing so is that the high levels of material acquisition and consumption typical of consumer materialism have been proposed to contribute to ecological destruction and to undermine human happiness and wellbeing (Gare, 1996; Kasser, 2002; McGilchrist, 2009). Understanding the hitherto unexplored ontological factors behind consumer materialism may enable the development of strategies to reduce levels of material acquisition and consumption, and increase psychological wellbeing.

The assumption underlying this thesis is that human beings are the products of interactions between biological, sociocultural and historical contexts (Gare, 1996; Hegel, 1830/1991, 1830/1970, 1830/1971, 1821/2001; Herder, 1765-1797/2004; Maslow, 1968, Ryan, 1995). That is, human beings simultaneously influence, and are influenced by, the world around them. In particular, it is believed that a consumer culture is typical of many contemporary Western societies (Dittmar, 2007, Kasser, 2002; see also Gare, 1996; McGilchrist, 2009). This results in an emphasis on extrinsic aspirations, such as desiring to have an appealing image, to be popular, or to have increasing levels of wealth as important goals in life (DeBord, 1995; Dittmar, 2007; Fromm, 1976/2005; Gare, 1996; Kasser & Ryan, 1993, 1996, 2001; McGilchrist, 2009; Seligman, 1990). In contrast are intrinsic aspirations (e.g., having meaningful relationships with others, contributing to one’s community; Grouzet et al.,
2005; Kasser & Ryan, 1993, 1996) which accord with evolutionarily determined, basic psychological needs and are common to all people (Deci & Ryan, 1985, 2000).

According to Self-Determination Theory (SDT; Deci & Ryan, 1985, 2000) these evolved, basic psychological needs comprise the need to act autonomously (i.e., acting in accordance with one’s desires which are harmoniously integrated with societal expectations), to feel competent (i.e., to overcome hardship or make a meaningful impact on one’s environment), and to affiliate with others (Baumeister & Leary, 1995; Bowlby, 1973; Deci & Ryan, 1985, 2000). These components also largely comprise Aristotle’s (1954) notion of eudaimonia; a way of living which promotes human flourishing. Additionally, while Aristotle suggested that money (i.e., an extrinsic goal) is a necessity to satisfy basic needs for safety and security (i.e., shelter and protection from the elements; Maslow, 1968), it should not become a central goal in one’s life. Only by pursuing a virtuous life focussed on attaining personal excellence and upholding social good (i.e., intrinsic goals), can one become eudaimonic. Accordingly, the pursuit of intrinsic aspirations has been found to result in higher levels of psychological wellbeing (Deci & Ryan, 1985; Kasser & Ryan, 1993, 1996; Ryan, 1995; Ryan & Deci, 2000; Sheldon, Ryan, Deci, & Kasser, 2004). Conversely, many studies have found that a greater focus on extrinsic, materialistic goals is associated with lower levels of wellbeing (see Deci & Ryan, 2000; Dittmar, Bond, Kasser, & Hurst, 2011; Wright & Larsen, 1993 for reviews). Therefore, a focus on normative extrinsic, materialistic goals within a consumer culture may not provide the conditions required to satisfy intrinsic, basic psychological needs and attain high levels of wellbeing. It may thus be important for individuals to examine, question, and potentially reject extrinsic, materialistic cultural norms, and to instead focus on intrinsic aspirations.
One of the main aims of this thesis is to examine the cognitive antecedents which may predict the extent to which one chooses to place importance on intrinsic or extrinsic, materialistic aspirations. This thesis thus comprises three studies which aim to identify the underlying perspectives leading to a focus on extrinsic aspirations and consumer materialism, and the means through which these perspectives may develop.

The first study commenced with an exploration of the influence of epistemic style (Eigenberger, Critchley, & Sealandar, 2007) within the context of SDT (Deci & Ryan, 1985, 2000). In particular, to examine how thinking styles may lead to placing importance on intrinsic or extrinsic aspirations and consumer materialism. Epistemic style suggests that Intellective Processors are questioning, effortful thinkers, whereas Default Processors tend to adopt effortless, expedient ways of thinking, with a greater tendency to unquestioningly adopt the status quo (Eigenberger et al., 2007). Thus, as a consumer culture may comprise the status quo in contemporary Western civilisation (Dittmar, 2007; Fromm, 1976/2005; Kasser & Ryan, 1993, 1996), Default Processors may be more likely to place importance on extrinsic aspirations and to be more materialistic. In accordance with previous research, it was expected that a greater focus on extrinsic aspirations and consumer materialism would be associated with reduced satisfaction of basic psychological needs (i.e., autonomy, competence, relatedness with others; Deci & Ryan, 1985, 2000) and wellbeing (e.g., Deci & Ryan, 2000; Dittmar et al., 2011; Wright & Larsen, 1993).

In Studies 2 and 3, the focus on epistemic style evolved into examining the importance of holistic and mechanistic ontological perspectives (Gare, 1996; McGilchrist, 2009). Holistic and mechanistic thinking have not been investigated previously in SDT research or studies investigating materialism. Gare (1996) and McGilchrist (2009) suggest that those who are predominantly holistic in their thinking
see the world as a dynamic, ever-changing flux in which all things are inherently interconnected within broader wholes. On the other hand, mechanistic thinking emphasises seeing the self, others, and the world in general as comprising static, separate parts which are independent of broader contextual factors. Both authors suggest that mechanistic thinking has been largely responsible for, and has become increasingly dominant, in the development of Western civilisation, including the development of a consumer culture. Results from the second study indicated that holistic thinking was associated with a greater focus on intrinsic rather than extrinsic aspirations and lower levels of materialism, and subsequently higher levels of wellbeing. The opposite was found for mechanistic thinking. As holistic and mechanistic thinking therefore appeared to be important constructs, the third study sought to examine the potential antecedents of these ontological perspectives via parenting styles, and to examine additional ways of measuring holistic and mechanistic thinking. Across all studies, existing research regarding the influence of intrinsic and extrinsic aspirations, materialism, regulation, basic psychological need satisfaction, and self-esteem on wellbeing was replicated.

The following chapters will introduce SDT (Deci & Ryan, 1985, 2000) which will be the primary psychological theory in this thesis. This will also include an overview of intrinsic and extrinsic aspirations. Furthermore, philosophical theories such as the fallacy of misplaced concreteness (Gare, 1996; Whitehead, 1929, 1938) and the influence of literacy (Hobart & Schiffman, 1998) will be used to explain why extrinsic aspirations may not contribute to the satisfaction of basic psychological needs to the same extent as intrinsic aspirations (see Deci & Ryan, 2000). Chapters will also review the literature pertaining to consumer materialism, the influence that
the pursuit of extrinsic aspirations, including material goods and money, has on wellbeing, and the nature of wellbeing as conceptualised by this thesis.
Chapter 2: Self-Determination Theory

Self-Determination Theory (SDT) suggests that there are three basic, universal psychological needs which are common to all people: autonomy, competence and relatedness with others (Deci & Ryan, 1985, 2000). Autonomy involves feeling that one is in control of life and able to act in accordance with personal values and desires which are harmoniously integrated into social demands and expectations. Competence is the ability to make a meaningful impact on one’s environment and to overcome problems should they arise (Deci & Ryan, 1985, 2000). Relatedness is the psychological need arising from mankind’s evolution as a social animal to interact, care for and be connected to other human beings (e.g., Aristotle, 1954; Baumeister & Leary, 1995; Bowlby, 1973; Deci & Ryan, 1985, 2000; Maslow, 1968). The satisfaction of these evolved psychological needs is seen as a requirement for personal growth, optimal psychological functioning and wellbeing (Deci & Ryan, 1985, 2000; Ryan, 1995; Ryan & Deci, 2000).

Reis, Sheldon, Gable, Roscoe, and Ryan (2000) found that autonomy, competence, and relatedness with others were independently associated with higher levels of wellbeing. Sheldon, Ryan, and Reis (1996) found that daily fluctuations in both competence and autonomy independently predicted levels of wellbeing. Elderly nursing home residents have reported that daily satisfaction of autonomy and relatedness are associated with greater health and wellbeing (Vallerand & O’Conner, 1989). In addition, employees who report that their workplace enables the satisfaction of autonomy, competence, and relatedness with others tend to report greater levels of self-esteem and physical health (Deci, Ryan, Gagné, Leone, Usunov, & Kornazheva, 2001; Ilardi, Leone, Kasser, & Ryan, 1993).
Tasks or behaviours which involve the satisfaction of autonomy, competence, and relatedness with others are intrinsically motivating. Intrinsic motivation refers to activities that individuals want to do, and involves curiosity, spontaneity and interest (Deci & Ryan, 1985, 2000; Ryan, Sheldon, Kasser, & Deci, 1996). Extrinsic motivation refers to tasks, goals, or behaviours which are performed due to being modelled or prompted by others, or in accordance with values held by others (Deci & Ryan, 1985, 2000). Environmental factors can influence the extent to which basic psychological needs can be achieved or satisfied through influencing the development of intrinsic or extrinsic motivation (Deci & Ryan, 1985, 2000; Deci & Vansteenkiste, 2004). As described below, two sub-theories of SDT, Cognitive Evaluation Theory (CET; Deci, 1975; Deci & Ryan, 1985, 2000) and Organismic Integration Theory (OIT; Deci & Ryan, 1985, 2000) respectively pertain to the development of intrinsic and extrinsic motivation.

**Cognitive Evaluation Theory**

Cognitive Evaluation Theory (CET) was developed to explain how situational or environmental factors may enable the development of intrinsic motivation. According to White (1959) and DeCharms (1968) autonomy and competence are primary components of intrinsic motivation. With CET, Deci (1975) and Deci and Ryan (1980) suggested that events which support autonomy and provide a sense of competence foster the development of intrinsic motivation. The model was updated by Ryan (1982) to include how individual interpretation of salient situational aspects can influence the initiation and regulation of behaviour, and thus, the development of intrinsic motivation. That is, events which promote an external rather than internal locus of causality and thus undermine autonomy or perceived competence are expected to reduce intrinsic motivation. Furthermore, the extent to which an external
event is perceived as controlling (i.e., pressure to think, behave, or feel certain ways), informational (i.e., constructive feedback from a supportive source which enables one to strive to improve), or amotivating (i.e., no sense of competence) can enhance or decrease intrinsic motivation (Deci & Ryan, 1985, 2000). Aspects pertaining to autonomy, competence, and relatedness with others can also facilitate the development of intrinsic motivation.

**Autonomy.** To support the idea that autonomy is important in the development of intrinsic motivation, Deci (1971) examined the influence of external rewards (i.e., to create an external locus of causality) on intrinsic motivation by providing participants with a puzzle. Half of the participants received a financial reward for completing the puzzle, whereas the other half received no reward. Under covert observation after the experimenter had left the room, those who received no financial reward spent more time playing with the puzzle. As the reward provided an external locus of causality (i.e., no autonomous personal interest or motivation to complete the puzzle) behaviour ceased once the external motivator was removed. In general, money and other rewards can decrease intrinsic motivation (Ryan, Mims, & Koestner, 1983). A meta-analysis comprising 128 studies found that tangible, contingent rewards (e.g., money) consistently undermined intrinsic motivation (Deci, Koestner, & Ryan, 1999).

For example, Pritchard, Campbell, and Campbell (1977) found that participants who solved chess problems for money reported lower intrinsic motivation than participants who had completed the task with no incentives. These findings have been replicated with children (Anderson, Manoogian, & Reznick, 1976; Kruglanski, Alon, & Lewis, 1972), and adolescents (Pinder, 1976). For example, in samples of school children rewards such as stickers, ribbons (Lepper, Greene, & Nisbett, 1973),
tokens which could be exchanged for certificates or other rewards (Greene, Sternberg, & Lepper, 1976), access to toys (Lepper & Greene, 1975), marshmallows (Ross, 1975), and candy (Ross, Karniol, & Rothstein, 1976) all undermined intrinsic interest for a task (e.g., using markers to draw on paper; Lepper et al., 1973) which the children could freely engage in.

Additionally, receiving evaluation from others (Harackiewicz, Manderlink, & Sansone, 1984), surveillance (Lepper & Greene, 1975) and needing to meet deadlines (Amabile, DeJong, & Lepper, 1976) have also been found to detract from intrinsic motivation by creating external conditions which motivate behaviour. Conversely, providing choice (Swann & Pittman, 1977; Zuckerman, Porac, Lathin, Smith, & Deci, 1978) can increase intrinsic motivation. For example, students who were provided with choices in their classes reported higher levels of intrinsic motivation than those who were forced to follow the teacher’s orders (Goudas, Biddle, Fox, & Underwood, 1995). A focus on contingent rewards has also been shown to decrease creativity (Amabile, 1979, 1982), problem solving ability (McGraw & McCullers, 1979), and deep conceptual thinking (Grolnick & Ryan, 1987). Higher levels of autonomy in schools (Deci, 1971; Deci, Schwartz, Sheinman, & Ryan, 1981; Ryan & Grolnick, 1986), and at work (Deci, Connell, & Ryan, 1989) are associated with increased levels of intrinsic motivation, wellbeing, and satisfaction in study or work.

**Competence.** In addition to autonomy, perceived competence is also an important component of developing intrinsic motivation. Deci (1975) suggested that external events such as receiving feedback from another person can enhance or diminish autonomy or competence. For example, positive feedback may increase feelings of competence whereas negative feedback can diminish these feelings, detracting from intrinsic motivation (Deci, 1975; Deci & Ryan, 1985, 2000).
Accordingly, negative feedback has been found to detract from intrinsic motivation (Kast & Connor, 1988), whereas positive feedback can enhance intrinsic motivation (Blanck, Reis, & Jackson, 1984; Boggiano & Ruble, 1979; Deci, 1971), but only when an individual feels responsible for a positive performance or outcome (Fisher, 1978). Thus, the development of intrinsic motivation is influenced by the extent to which feedback positively or negatively affects perceived competence (Vallerand & Reid, 1984).

Competence can also be enhanced through the completion of optimally challenging tasks, rather than through tasks that are too hard or too easy (Deci & Ryan, 1985, 2000). For example, when free to choose a task to complete, participants often select challenging, but still achievable tasks (Danner & Lonky, 1981; Shapira, 1976), and appear to derive more satisfaction from doing so in comparison to completing very easy tasks (Harter, 1974, 1978). Intrinsic motivation has also been found to increase when completed tasks become progressively more difficult (McMullin & Steffen, 1982).

**Relatedness.** Relatedness, by providing a secure relational base which may provide people with the confidence and security to engage in the innate striving for personal growth, is also important in providing the environment in which autonomy and competence can be maximised (Deci & Ryan, 2000). For example, securely attached children with autonomy-granting mothers tend to engage in more exploratory behaviours (Frodi, Bridges, & Grolnick, 1985). Similar research has found that children who perceived their teachers to be cold and uncaring tended to have lower levels of intrinsic motivation (Grolnick & Ryan, 1989). Conversely, warm, caring teachers tend to have more intrinsically motivated students (Ryan & Grolnick, 1986; Ryan, Stiller, & Lynch, 1994). It has also been found that children working on a task
in the presence of an adult who is ignoring them display lower levels of intrinsic motivation (Anderson et al., 1976).

**Organismic Integration Theory**

In contrast to CET which attempts to explain the development of intrinsic motivation, Organismic Integration Theory (OIT; Deci & Ryan, 1985, 2000) attempts to explain the means through which people engage with extrinsically motivated behaviours. Deci and Ryan suggest that motivation is a relationship between the individual and social or environmental factors. This is similar to the consideration of people being defined by contextual, social-cultural-politico factors (Hegel, 1830/1991, 1830/1970, 1830/1971, 1821/2001; Gare, 1996), who are defined by their context (Spinoza, 1677/2001), and develop individual self-expression by engaging with and expressing one’s culture (Herder, 1765-1797/2004). In particular, OIT contends that a majority of what people do in life is inherently extrinsically motivated as all people must internalise and conform to external demands which dictate civil behaviour. Furthermore, all people have a natural tendency to internalize external demands (Deci & Ryan, 1985, 2000; Ryan, 1995). These external influences may include social norms, obligations, rules or laws, or the desire to attain instrumental outcomes. The extent to which these external demands are internalised and integrated into the self, indicating a progression from an external locus of causality to an internal locus of causality, influences feelings of autonomy (Deci & Ryan, 1985, 2000). Extrinsic motivation thus exists on a spectrum reflecting the extent to which behaviour is impelled by external demands, or that such demands have been internalised with an individual taking ‘ownership’ over them, resulting in autonomous action. At one end of the OIT spectrum is amotivation, followed by four levels of extrinsic regulation.
existing on a continuum from controlled to autonomous regulation, and finally, intrinsic regulation.

Amotivation occurs when there is no rationale or understanding for why one is engaging in a particular behaviour. It involves compliance with external demands with no self-determination. The most controlled form of extrinsic regulation is external regulation, in which behaviour is often to attain or avoid consequences, such as to get a reward or avoid punishment. The next stage, introjection, involves the internalization of external demands which are still highly controlling. It involves doing things because one believes it is what ‘should’ be done, or what is ‘expected’. Not meeting these demands or living up to the expectations of others, for example, can be met with feelings of shame or guilt (Deci & Ryan, 1985, 2000).

The next two stages involve increasing levels of autonomous regulation. The first of these, identification, occurs when an individual can see the importance or relevance of a certain behaviour, goal, or value. In this case, the behaviour is self-motivated rather than impelled by reward, threat of punishment, or the expectations or demands of an outside source. The most autonomous stage of extrinsic regulation is Integration. This stage of regulation is marked by an individual engaging in something because it is deemed to be a part of one’s sense of self. For this reason, it is considered to be the ultimate form of socialisation as behaviour is not guided because rules, laws and expectations demand it, but because those external demands have been internalized and adopted as one’s own (Deci & Ryan, 1985, 2000). In addition, those who are generally integrated in their regulation often bring integrated aspects into harmony with other aspects of their values and identity (Pelletier, Tuson, & Haddad, 1997; Ryan, 1995). The final regulatory stage is intrinsic regulation. This stage represents behaviour which is motivated by the inherent enjoyment or satisfaction
involved with the behaviour (Deci & Ryan, 1985, 2000). For example, Chandler and Connell (1987) found that older children tended to report more internalized reasons for doing chores (i.e., understanding why the chores were worth doing), whereas younger children tended to provide more external reasons (i.e., to avoid punishment; to gain a tangible reward; to gain approval or acceptance from peers, siblings or parents; to follow the rules). While there may be a natural tendency to internalize external demands, the extent to which autonomy, competence and relatedness are encouraged can influence the development of autonomous regulation (Deci & Ryan, 1985, 2000).

Deci, Eghrari, Patrick, and Leone (1994) gave participants an uninteresting task and found that providing a meaningful rationale for completing the task, acknowledging participants’ belief that the task was uninteresting, and providing participants with choice (i.e., autonomy) and control (i.e., competence), resulted in higher levels of internalization, autonomous behaviour, and enjoyment in the task. Instructors in a medical course who were more autonomy supportive were found to have had students who internalized the material and become more autonomously regulated in their learning (Williams & Deci, 1996). Obese individuals participating in a diet program who felt that the staff were autonomy supportive had more autonomous reasons for participating in the program, attended more sessions, exercised more regularly, lost more weight, and were able to maintain their reduced weight (Williams, Grow, Freedman, Ryan, & Deci, 1996). Grolnick and Ryan (1989) found that parents who were more autonomy supportive tended to have children who had internalized and found value in school-related activities, and were more intrinsically motivated. Children who rated their parents as autonomy supportive were also more autonomous in their regulation (Grolnick, Ryan, & Deci, 1991). It has been
found that school children who feel that their parents and teachers care for them (i.e., relatedness) are more likely to internalise their school’s external rules and regulations (Ryan, et al., 1994). In contrast, university students who leave before graduating tend to report lower levels of autonomous regulation (Vallerand & Bissonnette, 1992), and tend to come from families or have teachers who are less autonomy supportive (Vallerand, Fortier, & Guay, 1997). Similar findings have also been reported in Japanese (Hayamizu, 1997; Yamauchi & Tanaka, 1998) and Russian (Chirkov & Ryan, 2001) samples. Increased levels of autonomous and intrinsic regulation have therefore been consistently associated with a range of positive outcomes related to the internalization of values and the ability to seek out or understand information.

**Outcomes of controlled and autonomous regulation**

Ryan and Connell (1989) found that introjected and identified regulation were associated with trying hard in school and in parents’ reports that their children appeared motivated. As a form of controlled regulation, introjection was found to predict higher levels of anxiety and inability to cope with failure. Identified regulation, a form of autonomous regulation, was associated with greater enjoyment of school and a better ability to cope with failure (Ryan & Connell, 1989). It has also been found that students who feel more autonomous also perceive themselves as being competent, and are likely to adopt and internalize values associated with their course (Williams & Deci, 1996). Greater levels of autonomous regulation have also been associated with greater progress towards one’s goals, and higher levels of wellbeing after attaining goals in comparison to those who are more controlled in their regulation (Sheldon & Kasser, 1998). In addition, Ryan, Rigby, and King (1993) found that individuals who attend church for autonomous, identified reasons (i.e., “Turn to God because it is satisfying”) tended to report higher levels of mental health
than those who attend for controlled, introjected (i.e., “Turn to God because I’d feel guilty if I didn’t”) reasons.

Greater levels of autonomy in school-related behaviours have also been shown to correlate with increased academic performance (Grolnick & Ryan, 1989), greater conceptual understanding (Grolnick & Ryan, 1987), higher levels of achievement, and greater competence as reported by teachers (Grolnick, Ryan, & Deci, 1991). In university settings, autonomy has been associated with increased enjoyment in study and higher grades (Black & Deci, 2000). A combination of autonomy and perceived competence has also been found to be associated with higher grades and test scores, in addition to greater enjoyment and involvement in study, and less anxiety and boredom at school (Miserandino, 1996).

In terms of social issues, autonomous engagement in politics has been found to predict greater seeking of relevant information, the ability to hold complex views, and a greater likelihood to vote. Controlled reasons were associated with a tendency to be less engaged, to be more easily persuaded by others, and to rely on the opinions of others (Koestner, Losier, Vallerand, & Carducci, 1996). More information is also sought out and behaviour more likely to occur, in those who have autonomous reasons for engaging in environmental issues (Seguin, Pelletier, & Hunsley, 1998). In addition to environmental factors which can support or hinder the development of autonomous regulation, SDT suggests that one’s causality orientation can influence regulation.

Causality orientations

Deci and Ryan (1985, 2000) suggest that there are individual differences based on how one views the self and the world, referred to as causality orientations, which can influence the development of autonomous regulation. The three causality
orientations are autonomy oriented (i.e., behaviour is driven by personal values and interests), control oriented (i.e., choosing to behave based on external expectations or demands), and impersonally oriented (i.e., no personal intention or perceived competence).

An autonomous orientation reflects intrinsic and autonomous (i.e., integrated, identified) regulation, a control orientation reflects controlled (e.g., external and introjected) regulation, and an impersonal orientations reflects amotivation (Deci & Ryan, 1985, 2000). This theoretical link has been supported by research examining causality orientations and regulation in life in general (Vallerand, 1997). Those who have an autonomous rather than controlled causality orientation tend to have more autonomous reasons for studying (Williams & Deci, 1996), for exercise and weight-loss behaviours (Williams et al., 1996), and have more positive rather than defensive relationships with others (Hodgins, Koestner, & Duncan, 1996). Individuals with an impersonal causality orientation tend to be more amotivated in pro-environmental behaviours (Pelletier, Dion, Tuson, & Green-Demers, 1999). Both amotivation and impersonal orientations have also been found to predict low levels of mental health (Ryan, Deci, & Grolnick, 1995). It has also been suggested that those with a control orientation may be primarily focussed on gaining external outcomes (Kasser & Ryan, 1993). This is particularly important in relation to the pursuit of intrinsic or extrinsic aspirations.
Chapter 3: Intrinsic and extrinsic aspirations, the fallacy of misplaced concreteness, and the influence of literacy on the development of civilization.

Different goals and aspirations in life are more likely to be aligned with basic needs for autonomy, competence, and relatedness with others (Deci & Ryan, 2000; Kasser & Ryan, 1993, 1996). Two main types of aspirations have been identified: intrinsic (i.e., affiliation, community contribution, safety, self-acceptance, physical health) and extrinsic (i.e., conformity, financial success, having an appealing image, popularity; Grouzet et al., 2005; see also, Kasser & Ryan, 1993, 1996). Two neutral aspirations (hedonism, spirituality) which were argued to be neither wholly intrinsic nor extrinsic have also been identified (Grouzet et al., 2005).

It is believed that intrinsic aspirations are ‘of nature’ and associated with basic psychological needs, whereas extrinsic aspirations are not ‘of nature’. Intrinsic, rather than extrinsic, aspirations emphasise aspects of autonomy, competence, and relatedness with others (Deci & Ryan, 1985, 2000; Kasser & Ryan, 1993, 1996, 2001). For example, the intrinsic aspiration for affiliation (Grouzet et al., 2005; Kasser & Ryan, 1993, 1996) corresponds with the evolved need to have relationships with others (Baumeister & Leary, 1995; Bowlby, 1973). Extrinsic aspirations on the other hand, while potentially associated with competence (e.g., to have high levels of wealth to signify success) or relatedness (e.g., to impress others with what one owns), are expected to be the result of reifying culturally-created connotations associated with certain goods, objects, ideas, or values. Thus, intrinsic aspirations arise from evolved aspects of the human organism, whereas extrinsic aspirations may exist as reified, abstract social constructions. This notion accords with the fallacy of misplaced concreteness and provides an explanation as to why extrinsic aspirations are

**Fallacy of misplaced concreteness**

The fallacy of misplaced concreteness occurs when abstract concepts and ideas are reified and turned into concrete aspects of life (Whitehead, 1929, 1938). Gare (1996) suggests that while abstract thinking has been an important development in the history of human civilisation, problems emerge when abstract, socially-constructed abstractions are believed to represent reality. Gare suggests that the fallacy of misplaced concreteness is central to Marx’s (1973, 1976) criticisms of capitalism. For example, Marx (1844/1964, p.167) said, “I am a wicked, dishonest, unscrupulous and stupid individual, but money is respected, and so also is its owner. Money is the highest good, and consequently its owner is also good.” In this quote, Marx suggests that money - an abstracted trading token removed from, but representative of, labour, material products or services - has been reified and turned into a concrete means through which to define oneself. That is, the awareness of money as an abstract entity has been lost, resulting in the belief that money itself is the highest good, above and beyond that of one’s actions in the corporeal world that might provide the means to earn that money.

Nietzsche (1990) also suggested that problems can emerge if one fails to recognise abstractions for what they are. For example, Nietzsche suggested that truth often consists of illusions – metaphors, concepts, and ideas – which are no longer seen as being illusions. Over time and through repeated use these man-made viewpoints become fixed, ‘common sense’ components of everyday life. Furthermore, they also become meaningless, as they are disembodied from lived human experience and the
contexts through which they first came to be. Gare (1996) further suggests that abstract, illusory metaphors are often elaborated and combined into broader, elaborative conceptual frameworks. At each step, abstractions are built on abstraction, resulting in concepts which becoming increasingly distant reflections or representations of the true nature of reality. To fail to question the foundation of these assumptions and concepts – and to fail to see the world as more complex, interdependent, and mysterious than our abstract assumptions and concepts account for – is to commit the fallacy of misplaced concreteness. The concern is that if individuals reify the connotations associated with extrinsic rewards such as money (i.e., in accordance with Marx (1844/1964) that more money equates to being a better person) or material objects (e.g., using objects to define oneself rather than inherent skills, abilities, or personality; Aristotle, 1954; Fournier & Richins, 1991; Fromm, 1976/2005), they may attempt to satisfy their concrete, evolved basic psychological needs with abstract ideas which they have mistakenly believed to be concrete. In other words, human beings evolved to derive satisfaction from aspects of evolved human nature, not from socially-created goals or values.

Similarly, DeBord (1995) suggested that modern society comprises a ‘society of the spectacle’. That is, in contrast to eudaimonic (Aristotle, 1954) pursuits for intrinsic goals which are associated with evolved needs and lived experience (e.g., meaningful relationships; Deci & Ryan, 1985, 2000; Kasser & Ryan, 1993, 1996), life is focussed on pseudo needs; reified extrinsic connotations which have been culturally defined to represent a successful life. These include the connotations associated with material objects and products, or commercialised experiences. Akin with the suggestion that extrinsic aspirations do not satisfy basic psychological needs as well
as intrinsic aspirations (e.g., Deci & Ryan, 2000; Kasser & Ryan, 1993, 1996) DeBord (1995) also contended that pseudo needs are inherently unsatisfying.

Pseudo needs are created by corporate enterprises to maximise profits; to create products that people do not actually need, but that they think they need (DeBord, 1995). In the corporatized social environment, happiness is suggested to be achieved by buying things rather than other means, such as personal relationships, important experiences or achievements (i.e., intrinsic aspirations). Furthermore, as recognition, approval and status are achieved through external means rather than innate qualities, and since there are always new, more exciting and desirable consumer products being produced, an individual may never fully satisfy pseudo needs due to a constant consumer cycle (DeBord, 1995). Similarly, Spacks (1995) suggests that the rise of Capitalism in the eighteenth century resulted in increasing levels of boredom, brought about by a focus on new and novel, albeit fleeting, experiences and excitements. Evidence for the abstract nature of extrinsic aspirations, and that their existence is not necessarily aligned with the evolved needs of the human organism, is supported by literature which discusses the influence of literacy on the development of contemporary civilisation.

**Influence of literacy on the development of civilisation**

The ability to read and write is not an evolved one, but the acquisition of an external, artificial technology (Havelock, 1963; Ong, 2002; Tofts, 1997). While the human brain is naturally adept at learning spoken language (Pinker, 2000) or communicating via universal facial expressions and gesticulation (Ekman, 1999), literacy is not an inherent part of the human organism. It must be learned and is unlikely to develop spontaneously (Hobart & Schiffman, 1998; Ong, 2002; Tofts,
Despite this, the ability to read and write is often internalized to such an extent that it becomes as natural and effortless as breathing (Tofts, 1997).

In Plato’s time however, writing was viewed as being external to human beings as it involves the manipulation of arbitrary symbols by means of external apparatus, such as a stylus and suitable writing surface (Ong, 2002). In the Phaedrus (Plato, 2005), Socrates was said to be suspicious of this new technology. He claimed that by externalising memory in written form, human beings would no longer need, or be motivated, to learn or remember anything. A secondary concern was that the written word, unlike a real person, is unable to explain itself when misunderstood. Therefore, Socrates was concerned that society would descend into chaos as a result of people not knowing anything and misunderstanding everything. While this did not happen, the internalization of literacy has shaped how people think and remember, and influenced the development of society.

Through literacy, human beings have developed the ability to communicate beyond the limitations of time and space defined by face-to-face communication (Hobart & Schiffman 1998; Lucy, 1994; Ong, 2002; Tofts, 1997). Rather than physical presence being a requirement for communication, literate technologies which go beyond these corporeal boundaries allow communication with simulated presence; or telepresence. Telepresence is not restricted to the medium of written language (Ong, 2002), as it includes other communicative information flows such as sound and image (e.g., telephone, television, radio), and electronic communications such as email. In addition to changing the nature of human communication, literacy also changed how people were able to record ideas and knowledge for future reference (Hobart & Schiffman, 1998; Ong, 2002). Writing is a mnemotechnic, or a technology which allows one to supplant internal, biological memory to an external source (e.g.,
Barnet, 2001; Tofts, 1997). By changing the way in which individuals and society as a whole were able to communicate and retain information, literacy was responsible for a fundamental change in human cognition (Ong, 2002).

Speech, like all sounds, is ephemeral, for as soon as a word is uttered, it ceases to exist, and by its transient nature is unable to record information itself, apart from human memory (Ong, 2002). The temporal limitation of human speech is suggested to have had a significant effect on the way in which memory functioned. As posited by Havelock (1963), in a purely oral culture, in order for any knowledge to be retained, it needed to be constantly repeated. A primary method of achieving this was to create formulaic thought patterns and mnemonics which could be reconstituted and reordered, particularly within narratives, to pass ideas between people and onto future generations (e.g., Havelock, 1963; Hobart & Schiffman, 1998; Ong, 2002). For example, the method of loci involved mentally visualising an often frequented location and imagining oneself walking through it. Memorable objects associated with concepts one wished to recall were mentally placed along this mental ‘path’ (Yates, 1974). Written language however, is able to represent the components of speech in a concrete form (Hobart & Schiffman, 1998; Ong, 2002). Thus, the mind was freed up from using mnemonic formulas by being able to externally store knowledge, providing the capacity to develop more abstract, original thought (Havelock, 1963).

The influence of literacy on situational and abstract thought was observed by Luria (1976), who conducted interviews with pre-literate and semi-literate individuals in remote villages that had previously never been exposed to literacy. A majority of these individuals had spent their entire lives in a purely oral culture. When shown various geometric figures, pre-literate individuals related them to objects for which they had real-world experience. For example, a circle was interpreted as a plate or the
moon. In contrast, those who were moderately literate as a result of limited education named the shape based on its superordinate, categorical geometric name. Similarly, when presented with a hammer, saw, hatchet and log, literate individuals were able to group the items based on abstract, categorical terms; ‘tools’ and ‘non-tools’. Pre-literate individuals on the other hand claimed, “They’re all alike. The saw will saw the log and the hatchet will chop it into small pieces” (p. 56). When Luria attempted to explain categorical thinking to the pre-literate participants, it was dismissed as being trivial and unimportant in comparison to pragmatic, situational thinking. Furthermore, when asked to describe themselves or provide self-analysis, pre-literates would utilise a situational framework. A typical answer was, “I came here from Uch-Kurgan, I was very poor, and now I’m married and have children” (p. 150). This sort of self-description is typical of children up to age 11 within the concrete operational stage of cognitive development (Inhelder & Piaget, 1958). Children within this age group base self-descriptions on concrete, observable elements such as appearance and possessions, whereas more elaborate self-descriptions occur with the further development of abstract thought (i.e., formal operational thought; Inhelder & Piaget, 1958) in later adolescence (Montemayor & Eisen, 1977). The claim that literate thought is related to formal operational logic does not suggest that individuals in oral cultures were childlike or unintelligent. Rather, without literacy, cultural conditions did not enable or demand the same sort of thinking typical of literate cultures (Ong, 2002).

Concrete operational logic involves operating on situational reality. The formal operational stage involves operating on operations, or thinking about things for which an individual has no first-hand experience, or that cannot be observed (Inhelder & Piaget, 1958); that is, the knower is separated from known (Hobart & Schiffman,
Thus, on the basis of Luria’s (1976) observations, the development of formal operational logic, the style of thought which is commonplace in modern society, may have been influenced by literacy (Hobart & Schiffman, 1998; Ong, 2002). Many of the tenets of civilisation are based on developments arising from abstract thought, such as the creation of formal Greek logic (Ong, 2002) and the subsequent development of mathematics, which is the ultimate form of abstract thought (Hobart & Schiffman, 1998). Mathematics was subsequently important in developing modern science and enabling the Industrial Revolution (Ong, 2002), without which we would not have had the capacity to construct the modern world (Hobart & Schiffman, 1998; Ong, 2002). Additionally, without the development of mathematics, we would not have a system of economics as complex as the modern capitalist system (Eisenstein, 1979; Gare, 1996).

Luria’s (1976) research also indicates that human beings who have not internalised the technology of writing are naturally situational, concrete operational thinkers. Even with literate, university educated individuals, 40 to 60 per cent are likely to fail Piaget’s formal operational problems (Keating, 1979). Additionally, adolescents and adults often make decisions based on intuitive, situational factors rather than on the basis of formal operational logic (Jacobs & Klaczynski, 2002). That is, literate individuals also have a tendency to employ a situational, ‘seeing is believing’ method of decision making. This suggests that, situational, concrete operational logic appears to occur naturally and innately in the human organism. The capacity for abstract, formal operational logic however, has potentially been extended and enhanced by internalising the technology of literacy. Thus, humanity appears to have the capacity to transcend its own evolution by creating and functioning in a world of abstractions; a world created beyond the corporeal world and evolved human
needs and experience. While this capacity has had a tremendous influence on the
development of knowledge and understanding through the development of scientific
thinking, problems emerge when individuals reify abstract ideas and fail to see them
for what they really are (Gare, 1996; McGilchrist, 2009; Nietzsche, 1990); the fallacy
of misplaced concreteness (Gare, 1996; Whitehead, 1929, 1938). For example, when
the pursuit of extrinsic aspirations or the pursuit of material goods or money become
central pursuits in life (e.g., Aristotle, 1954; Belk, 1984; Dittmar, 2007; Gare, 1996;
Kasser & Ryan, 1993, 1996; McGilchrist, 2009), in which the focus is on man-made
values or goals rather than evolved, basic psychological needs (e.g., DeBord, 1995;
Deci & Ryan, 1985, 2000; Ryan, 1995). This point is important in understanding the
nature of consumer materialism.
Chapter 4: Consumer materialism

Fromm (1981) suggested that people have become ‘homo consumens’; that objects and things were now seen as more important than people, property more important than life, and capital more important than work. This view accords with the reification of external ideas, beliefs, and values, including those associated with material objects, so that they become concrete parts of life (e.g., Gare, 1996; Whitehead, 1929, 1938; see also Marx, 1976). Accordingly, Dittmar (1992) found that the same individual was perceived as being more successful and self-reliant when depicted with expensive possessions rather than basic goods. Additionally, rich people are seen as being more ‘cultured’ and ‘successful in everything’ in comparison to poorer people (Khanna & Kasser, 2001, as cited in Kasser, 2002, p. 53).

Inglehart (1990) considered materialism to be a broad social value. In particular, it was believed that a shift had occurred in first world societies resulting in a growing emphasis on ‘post-material’ values (Inglehart & Abramson, 1994). These include freedom, self-expression, and quality of life rather than strivings for money and possessions. Two reasons were provided to account for this shift; scarcity and socialization. Scarcity assumes that people who live in economically deprived conditions will place more emphasis on material gain in order to satisfy basic physical needs such as comfort and security (Abramson & Inglehart, 1995). The second reason, socialization, posits that an individual’s values reflect those that were predominant in childhood. Thus, those who grew up in material affluence with the associated comfort and security provided by those conditions may have the means to place more importance on post-material rather than material goals (Inglehart, 1990). Inglehart believed that the shift towards post-material values was the result of younger generations who experienced material affluence emerging into adulthood, whilst older
generations who experienced material hardship and subsequently desired material gain, starting to pass away. Ahuvia and Wong (1995) tested part of this hypothesis and found that there was no significant relationship between childhood economic insecurity and material values.

Inglehart’s (1990) theory suggests however, that all people are inherently materialistic. Similarly, within eudaimonia (Aristotle, 1954) and self-actualization (Maslow, 1968), there is the acknowledgement that material goods are required to satisfy basic, physiological needs, such as sufficient shelter and clothing to ensure safety and security. Despite this, both theories share the realisation that a sole focus on material acquisition can prevent one from focussing on attaining ‘higher’ mental goals (Aristotle, 1954), leading to a diminished sense of living (Maslow, 1968). Kasser (2002) also acknowledged that a certain level of material acquisition is necessary in life, with negative consequences for placing high levels of importance on extrinsic aspirations. As mentioned earlier, a primary focus on extrinsic rather than intrinsic aspirations may exist as a result of reifying the connotations associated with extrinsic aspirations (i.e., the fallacy of misplaced concreteness; Gare, 1996; Whitehead, 1929, 1938). This is problematic, as focussing on extrinsic rather than intrinsic aspirations may not adequately satisfy basic psychological needs (Deci & Ryan, 2000; Kasser & Ryan, 1993, 1996). It has thus been suggested that materialism can be a negative force if it becomes the central tenet of one’s life (Belk, 1984).

With consumer materialism, it is not the instrumental use of the object that is desired, but power, image, or the ability to boost self-esteem (e.g., Fenichel, 1938; Fournier & Richins, 1991; Heilbroner, 1956; Kasser & Ryan, 1993, 1996). For example, in samples from the US, Canada and Germany, Kilbourne, Grünhagen, and Foley (2005) found that materialism was associated with higher levels of self-
enhancement motives (i.e., wealth, authority, power), but with lower levels of self-transcendence motives (i.e., equality, peace, justice). Thus, congruent with the fallacy of misplaced concreteness, it is the reified extrinsic connotations associated with the object which are desired and have been turned into concrete pursuits, not the object itself. Accordingly, consumer materialism has been considered as an orientation which emphasises material acquisition as the means to attain happiness and social progress (Ward & Wackman, 1971); the belief that increased consumption or ownership of goods equates to greater pleasure and happiness in life (Looft, 1971; Richins, 1987; Richins & Dawson, 1992); that material goods are benchmarks to quantify success in life and to develop self-worth (Dittmar, 1992, 2005, 2007; Fournier & Richins, 1991; Richins & Dawson, 1992); and that material objects can fundamentally change and improve one’s life (DeBord 1995; Dittmar, 2007). Thus, consumer materialism has heretofore been defined as the extent to which individuals allow the pursuit of material goods and possessions to assume a central place in their lives (Belk, 1984; Richins & Dawson, 1992). Consumer materialism has also been conceptualised in a number of other ways (Ahuvia & Wong, 1995; Fournier & Richins, 1991).

Belk (1984, 1985; Belk & Pollay, 1985) considered materialism to comprise a number of personality traits, with a particular focus on the extent to which one attaches importance to worldly possessions. In particular, possessiveness (e.g., a desire to want to control or own items), nongenerosity (e.g., an unwillingness to give or share one’s possessions with others), and envy (e.g., feeling displeased and demeaned while desiring others’ possessions). This scale was modified (Ger & Belk, 1996) to include a fourth dimension, preservation (e.g., the conservation of events, experiences or memories in material form, such as photographs). Dittmar (2007)
suggests however, that this conceptualisation may be flawed. First, it assumes that materialism is the result of stable dispositions and does not account for fluctuations in materialism over time. Second, it may fail to measure core aspects of consumer materialism, such as those associated with the fallacy of misplaced concreteness. These aspects include using material possessions to display status, to judge the self and others on the basis of possessions and wealth, and the happiness or satisfaction that can be acquired through ownership of items (Fournier & Richins, 1991).

Another view on materialism was provided by Csikszentmihalyi and Rochberg-Halton (1981) who considered there to be two different types of materialism; instrumental and terminal materialism. Instrumental materialism involves material acquisition which aims to help one achieve one’s goals in life, with material objects viewed as mere ‘things’ which can be used as tools or methods to achieve personal goals. As explained by Fournier and Richins (1991), in accordance with utilitarianism (Bentham 1824/1987), material goods simply provide the means to achieve valued goals (Mill, 1871/1987). Conversely, terminal materialism was defined as when material acquisition is the goal in and of itself, with the aim of impressing others, or to meet a social demand such as showing how ‘successful’ one is in life. Csikszentmihalyi and Rochberg-Halton’s (1981) theory of materialism was criticised by Richins and Dawson (1992) however, as terminal materialism serves an instrumental purpose; to impress others. The desire to acquire wealth may really be a drive to attain power, a grandiose image or to boost self-esteem (Fenichel, 1938; Heilbroner, 1956).

Therefore, a better conceptualisation, consistent with the fallacy of misplaced concreteness (Gare, 1996; Whitehead, 1929, 1938) and the importance placed on extrinsic aspirations (Kasser & Ryan, 1993, 1996), is to consider terminal materialism
as the result of reifying the abstract connotations associated with material objects into concrete elements capable of defining the self. Kasser (2002) suggests that materialism can be driven by autonomous reasons to satisfy basic needs (e.g., wanting money to buy food; clothing for warmth), or controlled, extrinsic reasons such as wanting to impress others. For example, there is a difference between buying a car primarily to impress others (i.e., terminal) and buying a car primarily to travel to and from work (i.e., instrumental). Thus, in accordance with OIT (Deci & Ryan, 1985, 2000), instrumental materialism may be more autonomously regulated (i.e., using an item for a personally meaningful reason), whereas terminal materialism may involve using the same material object for controlled reasons (i.e., to project a certain image to others in order to receive praise or avoid criticism). For example, based on OIT, at the external level, material acquisition, such as buying a car, may be the means to elicit praise from another person. Introjected regulation may involve purchasing the car because of the perceived shame that might accompany not owning an expensive car. Integration might involve buying the car because one admires the design aesthetics or build quality of the car, and identified regulation might involve buying the car because one identifies as being a car lover. Intrinsic regulation may involve the enjoyment that comes from driving or maintaining the car. Therefore, it is not a particular object or the cost of that object which determines whether or not one can be classified as being materialistic, but the reasons motivating its acquisition.

Instrumental materialism then, occurs as a result of desiring material objects for utilitarian purposes. For example, such as the materially deprived person seeking greater safety or security (Inglehart, 1990), the virtuous, eudaimonic individual who seeks out the amount of material goods required to satisfy basic needs (Aristotle, 1954), or the average person seeking to acquire a material object which helps them
achieve a particular goal. Thus, only with terminal materialism would material goods be seen as the means to define oneself, which is associated with negative outcomes (e.g., Belk, 1984; Dittmar, 2007; Fournier & Richins, 1991; Kasser & Ryan, 1993, 1996; Richins & Dawson, 1992). Consumer materialism is therefore defined by the importance given to the extrinsic aspirations or reasons motivating the acquisition or use of a particular object, or the beliefs or values one holds about the nature of material goods (Fournier & Richins 1991; Richins & Dawson, 1992). On the basis of the Material Values Scale (MVS; Richins, 2004; Richins & Dawson, 1992), materialism involves centrality (i.e., how important the goal of acquiring material possessions is), happiness (i.e., acquiring material possessions leads to increased happiness), and success (i.e., the more possessions one has, and the more expensive those possessions are, the more successful one is in life).

The ‘normal’ side of materialism

Material acquisition is not inherently negative. For example, Guevarra and Howell (2014) found that experiential purchases, such as buying a musical instrument or spending money on going out to dinner with others, were associated with satisfying basic needs such as competence (i.e., gaining the skill of playing a musical instrument) and relatedness (i.e., spending time with others), which were associated with greater levels of happiness. Material acquisition can become negative however, if it is guided by a focus on extrinsic aspirations or as a result of controlled regulation (i.e., to avoid negative feelings arising from not meeting the expectations of others). For example, Garðarsdóttir, Dittmar and Aspinall (2009) found that once the reasons why people want money are accounted for, the relationship between financial success goals and wellbeing is no longer significant. That is, aspiring to attain wealth is not inherently negative; the reason why one wants wealth is important. In particular,
desiring the reified extrinsic aspirations of financial success to attain happiness was found to be an important predictor of low wellbeing. Srivastava, Locke and Bartol (2001) also found that it was not the importance placed on money that led to a negative relationship with subjective wellbeing, but the motives behind acquiring wealth. Motives such as social comparison, showing off, and overcoming self-doubt (i.e., terminal) were associated with reduced wellbeing, whereas reasons such as security and to support one’s family (i.e., instrumental) were positively related to subjective wellbeing. As the authors suggested, the desire to acquire money is problematic when it is used to do things it cannot do, such as to pursue extrinsic aspirations to enhance one’s relationships or alleviate self-doubt. Thus, while money can benefit one’s life if used to pursue innate, basic needs, acquiring money for the abstract, extrinsic connotations it confers, does not. Similarly, Carver and Baird (1998) found that autonomous reasons for pursuing extrinsic goals such as wealth were positively associated with self-actualization, whereas controlled reasons were negatively associated. Thus, attempting to satisfy innate, evolved, intrinsic goals is unlikely to be problematic. As suggested by Aristotle (1954), while wealth may be necessary to provide the means to focus on higher-order goals, it should not become a central goal.

Despite the assertion that the motives are more important than the content of goal striving (Carver & Baird, 1998; Srivastava et al., 2001), Sheldon et al. (2004) were critical of these findings. The authors suggested that the pursuit of extrinsic goals (e.g., money), even for autonomous reasons, may be less satisfying than striving for intrinsic goals (e.g., meaningful relationships with others) for autonomous reasons. Sheldon et al. asked participants to rate the importance of three intrinsic (e.g., “Having many close and caring relationships with others”) and three extrinsic (e.g.,
“Looking good and appearing attractive to others”) life goals. Participants then had to rate four different reasons why they might pursue each of those goals for controlled (i.e., external, introjected) and autonomous (i.e., identified) and intrinsic reasons. The results suggested that goal content mattered over and above the contribution of the motives for pursuing those goals. Thus, pursuing intrinsic aspirations for autonomous reasons appeared to be more beneficial than pursuing extrinsic aspirations for autonomous reasons. In relation to how happy participants rated they would be in pursuing each goal, participants expected that they would be less happy when pursuing extrinsic rather than intrinsic goals, and happier when pursuing goals for autonomous rather than controlled reasons. When participants were asked to provide self-generated goals, participants with the highest subjective wellbeing were those who pursued intrinsic goals for autonomous reasons. Sheldon et al. (2004) also conducted a longitudinal study which followed students before and after graduation. Subjective wellbeing was found to be highest in students who placed more importance on intrinsic post-graduation goals and were autonomously regulated.

On the basis of their findings, Sheldon et al. (2004) concluded that it is both the goal and the motives that influence happiness and wellbeing. Extrinsic goal pursuits are less beneficial than pursuing intrinsic goals, particularly when exacerbated by controlled regulation. These findings support the notion that pursuing needs which are not evolved and biologically determined, such as those arising from reifying extrinsic aspirations (e.g., DeBord, 1995; Gare, 1996), are psychologically detrimental. Conversely, individuals who are primarily motivated by intrinsic goals such as self-acceptance and affiliation with others are less distressed and report higher levels of wellbeing (Kasser & Ryan, 1993, 1996; Sheldon & Kasser, 1995; Sheldon et al., 2004). It has been suggested that the focus on acquiring material objects for
extrinsic, controlled reasons is the normative result of living in a consumer culture (Dittmar, 2007; Kasser & Ryan, 1993, 1996, 2001). A number of theories have been proposed to explain the means through which extrinsic, materialistic goals may become important in the lives of some people.

**Antecedents of consumer materialism**

**Rise of Capitalism.** It has been suggested that commencing from the end of World War Two, America in particular experienced a period of rapid industrialisation and urbanisation (Strinati, 2004) and subsequent economic growth, affluence and consumerism (Marcuse, 1968; Seligman, 1990). Post-War growth assisted this process by being at least partially responsible for the disintegration of traditional, mediating societal entities such as the church or sporting clubs, and the movement from tight-knit agrarian communities to the anonymity of large cities (Fromm, 1976/2005; Gare, 1996; Lane, 2000; Seligman, 1990; Strinati, 2004). Without mediating social entities, there was potentially less scope for developing a sense of identity and connection with others, resulting in consumerism to fill those voids (Dittmar, 2007; Seligman, 1990).

**Media influence.** Gitlin (1987), basing his work on the theory of cultural hegemony (Gramsci, 1971) suggested that commercial media communicates the dominant messages and cultural norms which define a society. Thus, within a consumer culture, messages emphasising pro-consumer values are the expected norm. Cultural hegemony suggests that ideas, beliefs, or values emerge from important, influential members of a society, such as those who are in power, who communicate ideas to the public. These ideas are eventually accepted as being ‘common sense’. Thus, focussing on extrinsic aspirations and material acquisition may become social
norms on the basis of commercial media which communicates pro-consumer messages to the public (e.g., DeBord, 1995; Gitlin, 1987; Kasser, 2002; Kasser et al., 2004; Strinati, 2004) in order to maintain the existing economic system and satisfy corporate economic imperatives (DeBord, 1995; Kasser, Cohn, Kanner, & Ryan, 2007).

Arguments surrounding the commercialisation of culture and society due to commercial media influence have existed since at least the 1920’s (see Strinati, 2004 for a review). Despite this, the exposure to pro-consumer messages may have become more prominent and influential due to increases in advertising (Buijzen & Valkenburg, 2003; Kasser, 2002; McGilchrist, 2009). For example, in 1972 the average male was exposed to 117-285 advertisements per day and the average female to 161-484 advertisements (Henderson, Adams, & Millers, 1972). Giddens, Schermer, and Vernon (2009) suggest that this number has increased, but that the general message – that acquiring consumer goods will enhance success, attractiveness and happiness (Pollay, 1986), or that acquisition is a prerequisite for self-satisfaction (Wulfemeyer & Mueller, 1992) - has remained constant. Giddens et al. (2009) examined 240 pairs of same-sex adult twins and found that consumer materialism was largely attributable to environmental factors (e.g., exposure to advertising) rather than genetic factors. Despite this, media exposure may not be an influence on all people.

Prior research has generally concluded that watching more television is associated with higher levels of materialism (e.g., Buijzen & Valkenburg, 2013; Cheung & Chan, 1996; Kasser & Ryan, 2001; Rahtz, Sirgy, & Meadow, 1989; Sheldon & Kasser, 1995; Shrum, Burroughs, & Rindfleisch, 2005; Shrum, Lee, Burroughs, & Rindfleisch, 2011; Sirgy et al. 1998). This is in accordance with cultivation theory (Gerbner, 1969, 1998) which suggests that repeated exposure to
specific notions or ideologies in the media may influence one’s perception of reality. Cultivation theory, however, has been criticised for not considering the perceived realism of content (Minnebo & Van Acker, 2004), and the amount of attention that people give to televised content may be more important than the amount of exposure (McNaughton-Cassill & Smith, 2002; Wilson, Martins, & Markse, 2005). Some studies have considered perceived realism, the amount of attention paid to advertisements, or perspectives that may be unique to people who are highly materialistic.

Richins (1987) found that the perceived realism of television advertisements mediated the relationship between exposure to advertisements and materialism. Thus, people who felt that the advertisements were more representative of ‘real life’ were more materialistic. Cheung and Chan (1996) found that greater exposure and perceived realism (operationalised as whether television programs and advertisements were perceived as being deceptive) were associated with higher levels of materialism. Shrum et al. (2005) found that greater television exposure and greater attention were associated with increased materialism, and Shrum et al. (2011) found that the level of engagement with a materialistic narrative influenced levels of materialism. It has also been found that materialistic individuals are more likely to compare themselves negatively to people on television (Sirgy et al., 1998), who are often attractive people living idealised lives (Richins, 1995).

The view that not all people are equally influenced by the media accords with the Uses and Gratifications theory of media consumption (Katz, Blumler, & Gurevitch, 1974) and the work of Hall (1980). Rather than being cognitively passive and unquestioningly accepting of everything seen in the media, Uses and Gratifications theory suggests that people actively access, attend to, and interpret
media (Katz et al., 1974). Hall (1980) suggested that there are dominant, negotiated, and oppositional readings of media. A dominant reading may occur if one agrees with the messages provided. If one completely disagrees with what is seen, an oppositional reading may occur. In the case that a message may conflict with aspects of an individual’s pre-existing views, a person may agree with some parts of what is seen and reject others; the negotiated reading. Thus, as found by Richins (1987), rather than a passive acceptance of dominant pro-consumer messages concordant to one’s amount of media exposure, it was only those who believed that the advertisements were realistic who appeared to be more materialistic. Thus, as suggested by Kasser et al., (2004), it may be that individuals who are already materialistic are drawn towards media which espouse the benefits of consumer materialism. They may also be more likely than others to accept or agree with pro-materialism messages. Therefore, while the media may have a role in reinforcing attitudes, it may be more likely that the media simply communicates those hegemonic messages already deemed acceptable by society (Gitlin, 1987). For example, Carver and Baird (1998) found that in addition to comparing themselves with people on television (see also Sirgy et al., 1994) materialistic people also compared themselves to people in their everyday lives, such as their neighbours. Similarly, Ahuvia and Wong (2002) assessed the extent to which people perceived their parents, peers, heroes, various other adult figures, and the local community as valuing materialistic social values in comparison to intrinsic values such as self-expression, belonging, aesthetic satisfaction, and quality of life. Growing up in a materialistic social environment was associated with greater materialism. Thus, parenting and one’s upbringing, including security in life, as well as self-esteem, may all be factors in encouraging materialism (Kasser et al., 2014).
Parenting. Parents who covet material possessions model this behaviour as being appropriate and ‘normal’, potentially influencing the way in which their children view material objects (Csikszentmihalyi & Rochberg-Halton, 1981). Accordingly, Kasser, Ryan, Zax, and Sameroff (1995) found that mothers who placed more importance on extrinsic values (e.g., financial success) than intrinsic aspirations, had children who also valued extrinsic aspirations highly. Mothers who placed importance on intrinsic aspirations had children who did the same (Kasser et al., 1995). Parenting has also been associated with materialism as a result of its influence on one’s sense of security in life, and also self-esteem or self-worth.

Lack of security. Abramson and Inglehart (1995) suggested that socialization (e.g., upbringing) was a factor predictive of materialism in addition to scarcity (i.e., lack of material or financial security). Growing up in an economically insecure family was found to predict higher levels of materialism (Kasser et al., 1995). Furthermore, a secure relational base, such as that provided by authoritative parenting (Baumrind, 1966, 1971, 1972), is required to enable the development and expression of intrinsic motivation (Deci & Ryan, 2000). Research has indicated that children from divorced backgrounds (Rindfleisch, Burroughs, & Denton, 1997; Roberts, Manolis, & Tanner, 2008), who have infrequent communication with their parents (Moore & Moschis, 1981), have overly punitive, involved, or uninvolved parents (Cohen & Cohen, 1996), or have parents who do not support their autonomy (Williams, Cox, Hedberg, & Deci, 2000), tend to be more materialistic. Cold and controlling parenting leading to low self-worth has been found to predict higher levels of materialism (Kasser et al., 1995). Therefore, insecurity and low self-esteem may also be involved in materialism.
In addition to the influence of parenting, it has been suggested that insecurity resulting from environments or experiences which thwart fulfilment of autonomy, competence and relatedness (Ryan & Deci, 2000), as well as safety (Maslow, 1954, 1968), may increase materialism (Kasser et al., 2014). General uncertainty in life, social exclusion and hunger (Briers, Pandelaere, Dewitte, & Warlop, 2006; Chang & Arkin, 2002; Twenge, Baumeister, DeWall, Ciarocco, & Bartels, 2007), and being primed to think about one’s death (Kasser & Sheldon, 2000) have all been associated with greater levels of materialism.

Inglehart (1990; see also Abramson & Inglehart, 1995) proposed that economic insecurity accounts for why poorer countries tend to be more materialistic than richer countries; generations raised in bad economic times are more materialistic than those raised in prosperous times; and national recessions generally increase people’s materialism. That is, financial insecurity which may undermine the ability to satisfy basic needs (i.e., shelter, food; Maslow, 1968; see also Aristotle, 1954), may result in overcompensation; being highly desiring of material goods. In support of this, Sheldon and Kasser (2008) found that university students placed more importance on material goals when asked to imagine graduating during an economic recession in comparison to when the economy is strong. Kasser (2009) however, suggests that difficult times can result in some people moving further away from materialistic goals. According to Garðarsdóttir, Janković, and Dittmar (2008), Iceland was a country with a generally high focus on material aspirations. Kasser et al. (2014) tested an Icelandic sample over a six month period following the global financial crisis and found that materialistic concerns increased in a majority of respondents, and either did not change or declined in others. A decline in materialistic concerns was
associated with an increase in wellbeing whereas the opposite was found for those who became more materialistic.

Further research has provided mixed support for whether economic insecurity leads to materialism. Christopher, Marek, and Carroll (2004) found no relationship between socioeconomic status and materialism. Conversely, Goldberg, Gom, Peracchio, and Bamossy (2003) found that materialistic young people tended to be from families with lower incomes. A lack of convergent findings may be due to differing materialistic motivations. During times of economic insecurity, those who place higher levels of importance on extrinsic aspirations may desire material goods in order to maintain their image. Other individuals may desire material goods for utilitarian, instrumental survival needs. Thus, the difference may be between those who reify material possessions and use them to maintain a contingent sense of self-worth or self-esteem, and those who use material objects for instrumental purposes.

**Low self-esteem.** Self-esteem is considered as a positive orientation towards oneself, based on an evaluation of one’s worth or value (Rosenberg, 1989). Crocker and Knight (2005) discuss self-esteem as contingent self-worth which can fluctuate depending on positive (e.g., being accepted by others) or negative (e.g., poor academic performance) experiences in life. Maslow (1968) and Rogers (1959) suggested that unconditional acceptance and respect from others is a fundamental component of maintaining self-esteem.

Extrinsic aspirations (e.g., image, popularity) and controlled regulation (e.g., introjected regulation; avoiding guilt or anxiety by meeting the expectations of others), suggest that material possessions may be used to boost self-esteem or project a self-image that is believed to aid in being accepted by others (e.g., Dittmar, 2007;
Fenichel, 1938; Fournier & Richins, 1991; Heilbroner, 1956, Kasser & Ryan, 1993, 1996). Low self-esteem or self-worth is associated with higher levels of materialism (Kasser & Ryan, 1996, 2001). Furthermore, in the face of psychological insecurity people may use the culturally-encouraged path of striving for money and possessions as a means of coping with their unpleasant feelings (Kasser et al., 2014).

Adolescents who have their self-esteem boosted tend to orient away from materialistic concerns (Chaplin & John, 2007), whereas children who are rejected by their peers tend to endorse materialistic goals more (Banerjee & Dittmar, 2008). Materialism has been associated with higher levels of self-doubt (Chang & Arkin, 2002), fear of negative evaluation or social disapproval (Christopher & Schlenker, 2004), or using objects as substitutes for poor relationships (Rindfleisch, Burroughs, & Denton, 1997). Braun and Wicklund (1989) found that material items were often sought to compensate for low self-worth. For example, they found that new members at a tennis club were more likely to purchase expensive equipment than people who had been a member of the club for longer. The latter were more likely to have a larger number of social connections and sense of acceptance within the club. Kasser et al. (2014) also implemented a longitudinal program to assist teenagers in financial management in an attempt reduce materialistic values. Material values appeared to reduce over time in combination with an increase in self-esteem.

**Outcomes of extrinsic aspirations and materialism**

Kasser (2002) suggests that higher levels of consumerism are required as one habituates to their existing level of materialism. That is, increasing levels of consumption are required in order to maintain happiness or satisfaction (see Brickman & Campbell, 1971). Kasser (2002) suggests that this is particularly troublesome as
high levels of materialism and the pursuit of extrinsic aspirations are associated with reduced wellbeing (see Dittmar et al., 2011; Wright & Larsen, 1993). It has also been suggested that increasing levels of materialism are responsible for increases in depression (Seligman, 1990) and psychopathology (Twenge, Gentile, DeWall, Ma, Lacefield, & Schurtz, 2010). Prior to reviewing research which has examined the influence of materialism, money, and extrinsic aspirations on wellbeing, the following chapter will provide an overview of some dominant conceptualisations of wellbeing.
Chapter 5: Eudaimonia and wellbeing

Wellbeing has been conceptualised in a number of ways, including eudaimonic, subjective, and organismic wellbeing. Due to the focus of this thesis on the ways in which people look at the world (e.g., epistemic style), and the concordance that one’s goals have with evolved human needs (e.g., aspirations and SDT), this thesis will focus primarily on subjective and organismic forms of wellbeing. The reasons for this are outlined below.

In relation to eudaimonic wellbeing, eudaimonia as conceived by Aristotle (1954) is a process or way of living and doing well which emphasises human flourishing (Robinson, 1989), associated with reaching one’s potential (Waterman, 1984). Eudaimonia was not considered to be an ultimate goal, but a constant way of living which emphasises intrinsic rather than extrinsic aspirations and goals. For example, Aristotle (1946, pp. 280-281) suggested that, “(Happiness) belongs more to those who have cultivated their character and mind to the uttermost, and kept acquisition of external goods within moderate limits, than it does to those who have managed to acquire more external goods than they can possibly use, and are lacking goods of the soul….Any excessive amount of such things must either cause its possessor some injury, or, at any rate, bring him no benefit.” Goods of the soul as Aristotle referred to them have much in common with SDT (Deci & Ryan, 2000).

Autonomy, competence and relatedness with others

Akin to autonomy, Aristotle (1954) suggested that, “Pleasure is an experience of the soul, and each individual finds pleasure in that which he is said to be fond” (p.79). Thus, similar to integrated or intrinsic (i.e., autonomous) regulation or intrinsic motivation (Deci & Ryan, 1980, 1985), individuals should pursue those things which
they are passionate about and find inherently compelling. Furthermore, Aristotle (1954) suggested that actions can be classified as voluntary, involuntary or non-voluntary. In line with External regulation (Deci & Ryan, 1985, 2000), involuntary actions are those that are performed under compulsion or impelled by an external force. If actions are deemed worthy or important based on current circumstances they may become voluntary actions, which is conceptually similar to autonomous (i.e., identified and integrated) regulation. Non-voluntary behaviours were defined as those that are done accidentally or without awareness, similar to amotivation. Thus, concordant with SDT and OIT (Deci & Ryan, 1985, 2000), Aristotle (1954) proposed that pleasure in life requires autonomous rather than controlled regulation. Aristotle also suggested that autonomous action is likely to arise from engaging in activities in which one is highly skilled or competent.

Aristotle (1954) suggested that what separates man from other animals is the capacity for logic and reason. Pleasures of the body were thus regarded poorly and considered ‘brutish’ by Aristotle as they are also shared by other animals. To be eudaimonic was considered to involve seeking out, focussing on and extending one’s mental capacities and skills, rather than to focus on physical pleasures. Thus, by suggesting that pleasure in life arises from attaining excellence in one’s skills or abilities, Aristotle suggested that competence was an important part of eudaimonic functioning. Finally, Aristotle suggested that a number of prerequisite needs such as relatedness with others must be met to provide conditions in which one can focus on rational activity and action. Aristotle noted that man is a social animal and thus needs to be surrounded by significant others such as friends and family. There are additional parallels between eudaimonia and SDT.

**Internalization of external demands**
Similar to OIT (Deci & Ryan, 1985, 2000) Aristotle (1954) suggested that life is a balance between doing what is intrinsically motivating and adhering to the moral codes which are internalised as a result of socialisation (p. 91). Furthermore, both eudaimonia (Aristotle, 1954) and SDT (Deci & Ryan, 1985, 2000) conceptualise autonomous action as integration between personal desires and one’s society, rather than selfish individualism.

Aspirations

Eudaimonia also emphasises the importance of intrinsic rather than extrinsic aspirations. Aristotle (1954) believed that extrinsic aspirations such as the need for money were prerequisites to live a eudaimonic life. For example, similar to Maslow’s (1968) hierarchy of needs, which suggests that a lack of safety and security can stifle the ability to engage in personal growth, Aristotle (1954) considered money as the means to satisfy basic needs to focus on higher-order needs. Aristotle also suggested, in accordance with the fallacy of misplaced concreteness (e.g., Gare, 1996, Whitehead, 1929, 1938) and SDT (Deci & Ryan, 1985, 2000; Kasser & Ryan, 1993, 1996) that money should not become a central goal in life. For example, Aristotle (1954) suggested that many individuals rate money and the prestige it provides them with as the primary methods of attaining happiness. They come to realise however that their health is more important than their wealth when they get sick, for example. Thus, Aristotle suggested that one should focus on evolved, basic psychological needs and intrinsic aspirations rather than socially-created extrinsic aspirations.

Therefore, it appears that eudaimonia accords closely with SDT (Deci & Ryan, 1985, 2000), and is a process, or way of living, which may lead to wellbeing, rather
than being a form of wellbeing itself. This is an import consideration for the legitimacy of eudaimonic wellbeing.

**Eudaimonic wellbeing**

Ryff (1989) proposed a measure of eudaimonic wellbeing as an improvement over existing measures of psychological wellbeing. Ryff was critical of the work of Bradburn (1969) who first formulated that wellbeing may comprise positive and negative affective responses. This however, was based on an erroneous translation of eudaimonia to mean happiness, rather than as a process of living or doing well (Robinson, 1989) and aspiring to reach one’s potential (Waterman, 1984). Based on a review of eudaimonia and existing wellbeing literature, Ryff (1989) considered wellbeing to comprise self-acceptance, positive relationships with others, autonomy, environmental mastery, purpose in life, and personal growth.

Self-acceptance involves positive attitudes towards the self, including an acknowledgement of one’s positive and negative characteristics. Positive relationships involve having warm, trusting relationships with a personal capacity for empathy, intimacy and cooperation. Autonomy involves being self-determined with an internal locus of control, whereas environmental mastery involves the ability to feel competent and to operate effectively within one’s environment. Purpose in life involves feeling that one has a sense of direction and meaningfulness, and Personal growth comprises feeling that one can continually grow and learn new things on a path of realising one’s potential (Ryff, 1989).

Autonomy, environmental mastery, and positive relationships are similar to the three basic psychological needs (i.e., autonomy, competence, and relatedness with others) proposed by SDT (Deci & Ryan, 1985, 2000). Purpose in life is also
conceptually similar to autonomous regulation, in that it involves a sense of meaningfulness and self-direction. Self-acceptance and personal growth are both considered to be intrinsic aspirations (Grouzet et al., 2005; Kasser & Ryan, 1993, 1996). Thus, Ryff’s (1989) measure appears to accord with eudaimonia as conceptualised by Robinson (1989); a process of living or doing well. Huta and Ryan (2010) suggested that Ryff’s (1989) measure is flawed as it combines the eudaimonic process of living (e.g., “I judge myself by what I think is important, not by the values of what others think is important”), with the conceptualisation of wellbeing as positive outcomes which arise from one’s process of living (e.g., “When I look at the story of my life, I am pleased with how things have turned out”). Huta and Ryan (2010) developed a measure of hedonia (e.g., pursuit of pleasure, enjoyment, and comfort) and eudaimonia. Both of these were considered to be motives for action (i.e., part of the process of living), independent but related to, wellbeing. In accordance with Seligman (2002) who suggests that wellbeing emerges from a combination of hedonic and eudaimonic pursuits, Huta and Ryan (2010) found that hedonic and eudaimonic motives for action both contributed to wellbeing. Peterson, Park, and Seligman (2005) found that high levels of hedonia and eudaimonia resulted in greater life satisfaction than either motive alone, or low scores on both. Therefore, eudaimonia should be considered as way of living which emphasises the satisfaction of basic psychological needs in accordance with SDT (Deci & Ryan, 1985, 2000) that promotes wellbeing, rather than as wellbeing itself. Thus, rather than eudaimonic wellbeing, other forms of wellbeing were expected to be suitable for this thesis.

Subjective wellbeing

Popularised as part of positive psychology (Seligman & Csikszentmihalyi, 2000), subjective wellbeing (SWB) relates to the emotional outcomes and cognitive
assessments associated with one’s experience of the quality of their life (Diener, 1984). SWB comprises a positive global assessment of life (i.e., satisfaction with life), high positive affect and low negative affect (Diener, Suh, Lucus, & Smith, 1999; Lucas, Diener, & Suh, 1996). There is however, no consensus about the exact composition of SWB. Happiness is sometimes considered to comprise life satisfaction, or as the result of positive affect (Kim-Prieto, Diener, Tamir, Scollon, & Diener, 2005; Steel, Schmidt, & Shultz, 2008). Diener et al. (1999) have suggested that the components of life satisfaction and positive and negative affect may need to be considered separately rather than part of a singular SWB construct. For example, whereas emotional states (e.g., positive and negative affect) can be context dependent and change depending on life circumstances (Diener et al., 1999), life satisfaction has typically been used to assess SWB over long periods of time (Steel et al., 2008). There has also been consternation regarding whether SWB is a distinct construct, or part of one’s personality traits.

It has been suggested that the influence of personality traits on SWB may explain SWB’s stability over time (Diener et al., 1999; Lyubomirsky, Sheldon, & Schkade, 2005). A meta-analysis by Steel et al. (2008) found that SWB was related to personality traits from the Five-Factor Model (FFM), particularly extraversion and neuroticism. Steel et al. (2008) also found that neuroticism, extraversion, agreeableness and conscientiousness were significant predictors of positive, negative and overall affect, as well as happiness, life satisfaction, and the perceived quality of recreational, social, and financial aspects of life. A smaller meta-analysis by DeNeve and Cooper (1998) however, found weaker relationships between personality variables and SWB. It has been suggested that extraversion (e.g., being sociable, optimistic, and expressive) and positive affect overlap substantially (e.g., Lucas &
Fujita, 2000; Suh, Diener, & Fujita, 1996; Watson & Clark, 1992, 1997), potentially to such an extent that they could be considered the same construct (Burger & Caldwell, 2000). Conversely, negative affect shares elements of neuroticism such as anxiety and depression (Steel et al., 2008). The extent to which personality may influence SWB define two main perspectives; top-down and bottom-up (Diener, 1984).

The top-down approach suggests that stable personality traits influence how positively or negatively an individual experiences and interprets events (DeNeve, 1999). Thus, due to heritable personality and affective factors, individuals may have a natural baseline level or ‘set point’ of SWB (Lyubomirsky, et al., 2005). As evidence for the heritability of SWB, Lykken and Tellegen (1996) compared monozygotic and dizygotic twins and found that 44 to 52% of the variance in SWB was associated with genetic factors. Research by Nes, Røysamb, Tambs, Harris, and Reichborn-Kjennerud (2006) suggested that genetic factors may account for up to 80% of the variation in SWB scores.

Despite a genetic predisposition towards positive or negative affect, this does not infer that individuals are unable to experience long term changes in SWB (Lykken & Tellegen, 1996; McGue, Bacon, & Lykken, 1993). Diener et al. (1999) suggest that external events may move individuals away from their SWB set-point to varying magnitudes depending on the subjective interpretation of the event. It is suggested however, that individuals will eventually return to their set-point. Similarly, Lyubomirsky (2001) suggests that while SWB is potentially a combination of genetic and personality factors, external events and circumstances (e.g., an increase in wealth), and mental or physical activities (e.g., a reduction in negative rumination
about events) may directly enhance SWB. The latter were considered to have a more enduring, long-term impact on SWB than external circumstances.

The bottom-up perspective emphasises the influence of external factors and events, and the extent to which they permit the satisfaction of basic psychological and physiological needs. It has been suggested by Diener et al. (1999) that top-down factors such as personality account for more variation in SWB than bottom-up factors. Similar to set point theory, the concept of hedonic adaptation has been provided as an explanation for the comparatively small proportion of variance in SWB accounted for by bottom-up factors (Diener, 2000). Hedonic adaptation suggests that people habituate to positive or negative life circumstances over time and return to their natural ‘set point’. People do not habituate to all circumstances equally. For example, imprisonment tends to be habituated to quickly, the death of a loved one is gradually habituated to, whereas irritating noises or other stimuli may not be habituated to at all (Diener, 2000). Due to habituation, individuals can also seek increasing levels of material acquisition (Kasser, 2002). Similar findings have also been found in relation to the acquisition of wealth. (This will be discussed in depth later.)

In the absence of negative events or circumstances, most people tend to experience positive affect and life satisfaction (Diener, 2000). Most research on SWB however has included individuals in modern, Western societies (Diener et al., 1999). Therefore, other cultures or countries with extreme poverty may provide results which place a different emphasis on top-down and bottom-up approaches. For example, as the need to eat is a basic physiological need (Maslow, 1968), a country in which famine is common may suggest that the bottom-up factor of starvation is substantially more important in determining SWB than personality factors.
Organismic wellbeing

A related construct to SWB is that of subjective vitality, which is suggested to reflect organismic wellbeing (Ryan & Frederick, 1997). Ryan and Frederick (1997) conceptualise subjective vitality as the enthusiasm and ‘spirit’ involved in feeling ‘alive’, which is suggested to involve both psychological and somatic aspects. As Ryan and Frederick argue, vitality has benefits over other measures of wellbeing as it is a purely phenomenological construct which does not rely on external criteria such as success, health, social support or aspirations. Ryan and Frederick found that vitality was positively correlated with self-actualization and self-esteem. It was negatively correlated with measures of anxiety, depression and psychological or somatic distress. Subjective vitality was also associated with greater physical health and psychological wellbeing. In relation to SWB, vitality was associated with higher levels of positive affect and lower levels of negative affect. In addition, vitality correlated positively with extraversion and negatively with neuroticism at moderate levels, similar to positive and negative affect, respectively.

In a study conducted by Fowers, Mollica and Procacci (2010), higher vitality scores were shown to be strongly and positively associated with higher levels of life satisfaction and positive affect, and negatively correlated with negative affect. Vitality was also found to be a bigger predictor of hedonic rather than eudaimonic wellbeing. Fowers et al. concluded that subjective vitality is associated with positive affective states rather than the eudaimonic factors proposed by Ryff (1989; e.g., self-development). Huta and Ryan (2010) however, found that eudaimonic and hedonic motives correlated similarly with vitality. Eudaimonic wellbeing using the Ryff
(1989) scale was also found to be moderately positively correlated with vitality (Brown & Ryan, 2003).

Ryan and Franklin (1997) also suggested that increased vitality should occur as a result of satisfying basic psychological needs (see Deci & Ryan, 1985, 2000). Accordingly, Nix, Ryan, Manly and Deci (1999) found that autonomous regulation was associated with vitality. The authors also found that success in an activity when pressured to do so (i.e., controlled regulation) resulted in happiness (i.e., items assessing how pleasant, comfortable, satisfied and content respondents felt) but not vitality. Only autonomous regulation was associated with increased vitality. Thus, certain conditions which promote SWB might not promote subjective vitality (Ryan & Deci, 2001). Sheldon et al. (1996) found that over a two week period, fluctuating levels of autonomy and competence were predictive of happiness and vitality. In addition, Reis et al. (2000) found that autonomy, competence and relatedness all uniquely contributed to happiness and vitality. Thus, organismic wellbeing assessed by subjective vitality, may be influenced by the extent to which individuals focus on innate, basic psychological needs or socially-created goals and aspirations. A range of studies which will be reviewed in the following chapter however, have indicated that focussing on materialism, money, and extrinsic aspirations, is associated with lower levels of wellbeing.
Chapter 6: The influence of materialism, money, and extrinsic goal pursuits on wellbeing

Materialism

A meta-analysis on 158 separate samples around the world found that there is consistent support for a negative relationship between materialism and wellbeing, despite different ways of measuring these constructs (Dittmar et al., 2011). An earlier meta-analysis (Wright & Larsen, 1993) also indicated that materialism is generally associated with lower levels of subjective wellbeing. For example, numerous studies have found a correlation between a high focus on materialism and a lack of overall happiness, wellbeing or meaning in life (e.g., Belk, 1984; Christopher & Schlenker, 2004; Kasser & Ryan, 1993, 1996; Ryan & Frederick, 1997). The relationship between materialism and lower levels of wellbeing have been replicated in Norway (Hellevik, 2003), Turkey (Karabati & Cemalcilar, 2010), Russia (Ryan, Chirkov, Little, Sheldon, Timoshina, & Deci, 2009), Germany (Schmuck, Kasser, & Ryan, 2000), and South Korea (Kim, Kasser, & Lee, 2003). In addition, these relationships have been observed in adolescents and children (Banerjee & Dittmar, 2008; Kasser, 2005). In an Australian sample, Saunders and Munro (2000) found that materialism was associated with increased feelings of anger, anxiety and depression, and lower levels of life satisfaction. Twenge et al. (2010) found that the extent to which American adolescents placed importance on extrinsic, materialistic goals was associated with higher levels of psychopathology. Furthermore, a meta-analysis of Minnesota Multiphasic Personality Inventory scores reported by high school and college students from the years 1938 to 2007 indicated a generational increase in psychopathology. The authors concluded that this may be a result of increasing societal emphasis on extrinsic, materialistic goals with a diminishing focus on
intrinsic goals. Karabati and Cemalcilar (2010) also found that materialism was associated with lower levels of subjective wellbeing, and that self-enhancement (i.e., achievement and power) motives were associated with higher levels of materialism. Tatzel (2003) found that using money and possessions to enhance social standing was associated with low wellbeing. It has also been found that while material acquisition is not inherently negative (i.e., buying a musical instrument to play music; Guevarra & Howell, 2014), desiring wealth or material gain as the direct means to increase happiness or for extrinsic self-enhancement motives, results in lower levels of wellbeing (Carver & Baird, 1996; Garðarsdóttir et al., 2009; Srivastava et al., 2004).

Money

Diener and Oishi (2000) found that a greater focus on making money was associated with reduced life satisfaction. In an American sample collected over the years of 2008 and 2009, Kahneman and Deaton (2010) found that happiness did not significantly increase beyond having a yearly household income of $75,000. In addition, wealth was associated with life satisfaction, but not emotional wellbeing. Aknin, Norton, and Dunn (2009) found a significant weak to moderate correlation between happiness and annual household income. While the authors did not indicate whether reported happiness significantly differed across different income brackets, happiness appeared to peak for annual household incomes at approximately US$160,000, and declined for individuals earning US$500,000 or above. It was also found that while participants were fairly accurate in their prediction about the level of happiness associated with high incomes, they greatly underestimated the happiness associated with having an annual household income below the median (US$55,000; Aknin et al., 2009). It has also been found that while average incomes of Americans doubled between 1956 and 1998, life satisfaction remained constant (Myers, 2000).
Similar results have been found in Europe (Easterlin, 1995) and Japan (Diener & Oishi, 2000). Similar to the findings of Aknin et al. (2009), Easterlin (1974) found that within a country, higher incomes were associated with higher levels of reported happiness. Furthermore, while income increased in the United States between 1946 and 1970, average reported happiness did not increase at a similar magnitude and was found to decrease between 1960 and 1970.

Easterlin, McVey, Switek, Sawangfa and Zweig (2010) found that there is often a short-term increase between income and subjective wellbeing, but over a minimum period of ten years there were no significant relationships between income and wellbeing. These findings were consistent across developed and developing countries, and Eastern European countries transitioning from socialism to capitalism. Research on lottery winners has also suggested that whilst happiness may increase in the short-term after winning, lottery winners are no happier than the average person (Brickman, Coates, & Janoff-Bulman, 1978). These findings are in accordance with the notion of the ‘hedonic treadmill’ within SWB (Brickman & Campbell, 1971). That is, as people tend to habituate to higher levels of material affluence (Kasser, 2002), individual wellbeing returns to a homeostatic set-point, meaning that higher levels of material acquisition are required to maintain high levels of wellbeing. Overall, these findings indicate that having more money may not inherently lead to ever-increasing levels of happiness. For example, Easterlin (1974) found that in poor countries, providing basic needs are met, reported levels of happiness were not significantly different to those in wealthier countries. This is problematic, because if the pursuit of money and wealth is a central goal, it may interfere with the ability to pursue intrinsic goals such as developing and maintaining relationships and having leisure time (Aknin et al., 2009; Deci & Ryan, 1985, 2000; Ryan, 1995). There appears to be a
difference however, between pursuing wealth for extrinsic reasons, and using wealth to satisfy intrinsic needs.

Having money can be a positive factor in life, as it can provide security and freedom. For example, money is an important contributor to the satisfaction of basic needs which can then provide the security and freedom to focus on more meaningful goals (e.g., Aristotle, 1954; Maslow, 1968). Accordingly, research has indicated that spending money on experiences or on other people rather than material objects promotes happiness (Dunn & Aknin, 2008; Guevarra & Howell, 2014; Van Boven & Gilovich, 2003). It has also been found that non-materialistic attitudes were associated with higher levels of experiential buying (e.g., choosing to spend money on attending events or eating at restaurants) which was associated with higher levels of wellbeing (Howell, Pchelin, & Iyer, 2012). Kasser and Sheldon (2009) have also found that after controlling for the effect of material affluence, ‘time affluence’ (i.e., having ample free time to live in accordance with one’s desires) was associated with increased levels of basic need satisfaction (e.g., autonomy, competence, and relatedness) and wellbeing. In addition, buying for autonomous reasons (e.g., to help one achieve one’s goals) was associated with greater satisfaction of basic needs and increased vitality, whereas the opposite was found for those who purchased for controlled (e.g., to receive recognition from others) reasons (Zhang, Howell, & Caprariello, 2012). Thus, greater levels of wealth may promote wellbeing, providing it is not sought after or used to satisfy extrinsic rather than intrinsic aspirations.

**Extrinsic aspirations**

Extrinsically motivated individuals display lower levels of vitality, wellbeing and self-actualizing tendencies (Kasser & Ryan 1993, 1996; Sheldon & Kasser,
Conversely, individuals who are primarily motivated by intrinsic goals such as self-acceptance and affiliation with others are less distressed and have higher levels of well-being (Kasser & Ryan, 1993, 1996; Sheldon et al., 2004). Garðarsdóttir et al. (2008) found that focusing on extrinsic goals for financial success was associated with less happiness and more psychological problems. Twenge et al. (2010) suggest that a generational increase in psychopathology is the result of an increasing focus on extrinsic aspirations.

Being excessively motivated by extrinsic aspirations (e.g., money, esteem, material goods) can distract from the pursuit of intrinsic endeavours (Deci & Ryan, 1980, 1985; Kasser & Ryan, 1993, 1996; Ryan et al., 1996). In addition, spending time or energy on extrinsic goal striving may take time or energy away from the ability to pursue and satisfy intrinsic goals (Aknin et al., 1999; Frey & Oberholzer-Gee, 1997; Deci & Ryan, 1980, 1985; Kasser & Ryan, 1993, 1996; Ryan et al., 1996). That is, individuals who spend all of their time working in order to earn enough money to satisfy extrinsic needs may neglect intrinsically motivating goals like affiliating with others (Richins & Dawson, 1992). Furthermore, if one places extreme importance on money and material gain, one can be enslaved by the demands required to achieve such a goal (Ryan, 1995). Such demands have the capacity to remove one’s freedom of choice and autonomy of behaviour (Deci & Ryan, 1985; Ryan, 1995). For example, Schor (1992, 1998) suggests that contemporary consumer culture in the United States which emphasises material gain as the pathway to happiness and success, results in many people working overtime and going into debt. Furthermore, the pursuit of extrinsic aspirations, wealth and material possessions can undermine needs for esteem thus preventing actualization (Maslow, 1968), subverting autonomy.
or preventing affiliation with others (e.g., Deci & Ryan, 1985; Kasser & Ryan, 1993; Ryan, 1995; Ryan et al., 1996).

To determine if extrinsic aspirations are inherently negative, or only become so depending on environmental factors, Vansteenkiste, Duriez, Simons, and Soenens (2006) assessed business students. Using environmental-match theory (e.g., Sagiv & Schwartz, 2000), Vansteenkiste et al. (2006) suspected that extrinsic goals may predict higher levels of wellbeing in situations that promote the importance of extrinsic goals. Despite extrinsic aspirations being a normative focus for business students, it was found that extrinsic aspirations were associated with lower levels of wellbeing. Furthermore, wellbeing was lower and substance abuse was higher for business students in comparison to students studying education who placed less importance on extrinsic aspirations. Similarly, Kasser and Ahuvia (2002) found that business students in Singapore who placed more importance on extrinsic aspirations and materialism reported lower levels of happiness, vitality, self-actualization, and increased anxiety and ill-health. Other longitudinal studies however, have provided mixed evidence as to the relationship between extrinsic aspirations and negative outcomes.

Sheldon (2005) found in a sample of American university students over the duration of their four year degree, that the importance placed on extrinsic goals was not significantly associated with changes in wellbeing. Niemiec, Ryan, and Deci (2009) found that the attainment of extrinsic goals over the course of a year provided no wellbeing benefits, whereas intrinsic goal satisfaction did enhance wellbeing. This study however, examined the attainment rather than importance placed on aspirations and goals. In a longitudinal study, Solberg, Diener, and Robinson (2004) attempted to increase participants’ materialistic aims, but found that this did not affect their mood.
Kasser et al. (2014) found that extrinsic aspirations remained stable from age 18 to 30, with a general decline in the importance placed on financial success goals. The decrease in importance placed on financial success corresponded with an increase in mental health. Another study by Kasser et al. tested students shortly after graduation and again after two years. The results indicated that a reduction in financial success goals over this time period were associated with an increase in wellbeing. Similar findings have been obtained in a range of diverse samples.

Khanna and Kasser (2001, as cited in Kasser, 2004) found in Indian and American university samples that intrinsically motivated individuals engage in work for the enjoyment or challenge it provides, whereas engagement for extrinsically motivated individuals is focused on obtaining rewards (e.g., good grades, money). Indian students who were more extrinsically motivated reported feeling more alienated at work, whereas American students reported feelings of alienation in their leisure activities and relationships with others. Finally, Sheldon, Elliot, Kim, and Kasser (2001) found in South Korean and American university students that individuals who used extrinsic outcomes (e.g., money) to determine whether or not an event in the previous week was important, reported more negative emotions and less positive emotions. It may therefore be important to identify which people are likely to place importance on intrinsic or extrinsic aspirations.
Chapter 7: Epistemic style

Overall, the literature suggests that a high focus on materialism and extrinsic aspirations is associated with lower levels of wellbeing (see Dittmar et al., 2011; Kasser, 2002; Kasser, Ryan, Couchman, & Sheldon, 2004; Kasser et al., 2014; Wright & Larsen, 1993 for reviews). Furthermore, the pursuit of extrinsic, materialistic goals may be seen as ‘normal’, meaningful life pursuits within a consumer culture (DeBord, 1995; Dittmar, 2007; Kasser & Ryan, 1993, 1996). This may subvert the ability to adequately satisfy intrinsic pursuits related to autonomy, competence and relatedness with others (Aknin et al., 1999; Deci & Ryan, 1980, 1985; Frey & Oberholzer-Gee, 1997; Kasser & Ryan, 1993, 1996; Ryan et al., 1996). Individuals who are able to question, understand, and potentially reject normative extrinsic, materialistic goal strivings, may be those who tend to focus more on intrinsic aspirations for autonomous reasons.

Gare (1996) suggests that ‘indwelling’, a process of enquiry to understand the world, is an important part of participating in and expressing meaningful elements of one’s culture (Hegel, 1830/1991, 1830/1970, 1830/1971, 1821/2001; Herder, 1765-1797/2004) and to find personal meaningfulness or justification so as to autonomously regulate external demands (e.g., Deci & Ryan, 1985, 2000). In addition, Aristotle (1954) suggested that eudaimonia involves the pursuit and development of a thorough understanding of how one fits into broader society. It may be that individuals who are generally more complex and effortful in their thinking, who are likely to question rather than acquiesce to societal norms, may be those who are less likely to reify extrinsic, socially-created goals (i.e., the fallacy of misplaced concreteness; Gare, 1996; Whitehead, 1929), and may thus focus more on intrinsic aspirations. Furthermore, these individuals are expected to be autonomously regulated
as a result of being able to understand the importance of various behaviours (i.e., identified regulation) or due to finding personal meaning or significance (i.e., integrated regulation). The construct of epistemic style may be suitable to investigate whether the complexity of one’s thought influences whether importance is placed on intrinsic or extrinsic aspirations.

Eigenberger et al. (2007) suggested that epistemic style is an important construct in relation to individual functioning (i.e., academic engagement) and also broader social concerns, such as democratic functioning. Epistemic style is a dual-processing personality construct involving the preference for one of two distinct cognitive styles representing ‘philosophical’ and ‘anti-philosophical’ thought. These habitual, implicit cognitive processes influence the construction and evaluation of beliefs, judgements and problem solving. As measured by the Epistemic Preference Indicator (EPI; Eigenberger et al., 2007), these processing styles are defined as Intellective Processing (IP) and Default Processing (DP). IP involves a general preference for complex, elaborative forms of thinking and judgement, whereas DP involves a preference for automatic, expedient and effortless thinking.

Thinking styles that focus on a desire for and enjoyment of thinking, such as Need For Cognition (NFC; Cacioppo & Petty, 1982; Cacioppo, Petty, & Kao, 1984), have been associated with a range of positive outcomes such as increased academic (e.g., Coutinho, Wiemer-Hastings, Skowronski, & Britt, 2005; Evans, Kirby, & Fabrigar, 2003; McIntosh & Noels, 2004; Sadowski & Gülgöz, 1996) and occupational performance (e.g., Carnevale, Inbar, & Lerner, 2011; Kearney, Gebert & Voelpel, 2009; Park, Baker, & Lee, 2008). While epistemic style has been associated with NFC and educational and occupational outcomes (Eigenberger et al., 2007), it is a conceptually broader construct associated with a wide range of beneficial outcomes.
This is evident in the correlations with convergent measures used by Eigenberger et al. to ascertain construct validity for both IP and DP.

IP thinkers demonstrated a desire for analytical thought (Eigenberger, et al., 2007), open (Costa & McCrae, 1992) and reflective thinking (Schraw, Bendixen, & Dunkle, 1999), whereas DP thinkers had a strong need for cognitive closure (Webster & Kruglanski, 1994), a tendency towards dogmatism (Altemeyer, 1996) and anti-intellectualism (Eigenberger & Sealandre, 2001). As IP thinkers adopt more holistic decision making processes that involve more complex moral and ethical issues, they are expected to be more able and willing to engage in analysing complex issues that may be personally uncomfortable or not in their own interests. Conversely, a person high in DP avoids thinking deeply about complex and challenging issues and may instead rely on mental shortcuts or cognitive avoidance strategies (Eigenberger et al., 2007). Thus, Eigenberger et al. (2007) suggested that people who are higher in IP should be more politically engaged as a result of being more engaged in, and critical of, complex issues. In contrast, those with a preference for the expedient, effortless thinking typical of DP were expected to be disengaged and to unquestioningly adhere to the status quo. Accordingly, Farrugia and Elphinstone (2013) found that individuals higher in IP tended to vote for autonomous reasons (i.e., due to understanding why voting is important) and to vote for a candidate based on policy. Default Processors reported voting for controlled reasons (i.e., to avoid receiving a financial penalty for not voting), and for superficial reasons such as a candidate’s personality.

Eigenberger et al. (2007) also found that college students scored significantly higher on IP than a general community sample that had little or no college education, and the opposite was found for DP. Thus, those who are higher in IP than DP may be more likely to seek out higher education opportunities, or IP may be fostered by
higher education. Furthermore, it was found that liberal arts students tended to be higher on IP and lower on DP than business students. It may be that a majority of business students are those who have chosen to pursue a degree which, within a consumer culture, is defined by getting a ‘good job’ with a good salary. That is, their higher level of DP may be representative of the tendency to adhere to dominant cultural and social norms. Those higher in IP who chose a liberal arts degree may be those who have questioned dominant norms and chosen to pursue an area of study that is intrinsically motivating for autonomous reasons (i.e., inherent interest in the course content), rather than pursuing a ‘good job’ for extrinsic, controlled reasons (i.e., to get a well-paying job in the future). Thus epistemic style may predict whether one focusses on normative extrinsic aspirations, or may have placed importance on intrinsic aspirations for autonomous reasons.

It is therefore expected that those who are higher in IP than DP may be more questioning of society in general, which may place importance on intrinsic rather than extrinsic aspirations, and to pursue these for autonomous, self-directed reasons. An orientation towards DP rather than IP however, may result in acquiescing to the dominant materialistic norms of a consumer culture, resulting in a greater focus on extrinsic aspirations for more controlled reasons.
Chapter 8: Study 1 Hypotheses

The hypothetical model which will be investigated in Study 1 is shown in Figure 1.

Figure 1. Hypothetical model for investigation in Study 1.
The overall aim of the model is to examine the influence of, and outcomes associated with epistemic style, which have not been investigated previously in SDT or materialism research. In particular, the process through which epistemic style may contribute to wellbeing as a result of directly and indirectly influencing aspirations, regulation, materialism, the satisfaction of basic psychological needs, and self-esteem.

According with the fallacy of misplaced concreteness (Gare, 1996; Whitehead, 1929, 1938) and the normative focus on extrinsic aspirations in a consumer culture (e.g., DeBord, 1995; Dittmar, 2007; Kasser & Ryan, 1993, 1996), it may be that individuals who are able to question dominant norms (e.g., are higher in IP than DP; Eigenberger et al., 2007), will be less likely to place high levels of importance on extrinsic aspirations and as a result, materialistic goals. Prior research has indicated that placing more importance on extrinsic aspirations and materialism is associated with reduced wellbeing (e.g., Dittmar et al., 2011; Wright & Larsen, 1993), low self-esteem (e.g., Kasser & Ryan, 1996, 2001; Kasser et al., 2014), and increased depression (Seligman, 1990). Thus, it is hypothesised that epistemic style, and in particular a greater orientation towards IP than DP, will be indirectly associated with higher levels of wellbeing and self-esteem due to the mediating influence of aspirations and materialism.

In addition, a greater comparative epistemic preference for IP than DP (i.e., higher Relative Intellective Processing Orientation scores) is expected to be directly associated with higher levels of autonomous regulation as a result of being able to understand and justify (Eigenberger et al., 2007) aspects of life in a deep, meaningful manner (i.e., autonomous regulation; Deci & Ryan, 1985, 2000). In addition, based on previous findings that the demands of extrinsic pursuits can be controlling (e.g., Aknin et al., 2009; Deci & Ryan, 1985, 2000; Frey & Oberholzer-Gee, 1997; Ryan,
1995), it is also hypothesised that placing more importance on extrinsic than intrinsic aspirations will lead to greater levels of controlled regulation. Thus, epistemic style is expected to be directly associated with regulation, and indirectly associated with regulation as a result of the influence of aspirations. Furthermore, as intrinsic aspirations are more likely than extrinsic aspirations and materialism to satisfy basic psychological needs (Deci & Ryan, 2000), and that autonomy is a basic psychological need (Deci & Ryan, 1985, 2000), it is expected that a greater focus on intrinsic than extrinsic aspirations, lower levels of materialism, and greater levels of autonomous regulation (i.e., higher GMS scores), will each be associated with greater satisfaction of basic psychological needs.

On the basis of previous findings which have found that autonomy (Deci & Ryan, 1985a) and the satisfaction of basic psychological needs (Ilardi et al., 1993) were associated with greater self-esteem, it is also expected that higher levels of autonomous regulation and greater satisfaction of basic psychological will be directly associated with higher levels of self-esteem. Greater satisfaction of basic psychological needs and higher levels of self-esteem are expected to be directly associated with increased wellbeing. As a result of these relationships, a greater epistemic focus on IP than DP is expected to be indirectly associated with higher levels of self-esteem and wellbeing.

In addition, it has been suggested that focussing on extrinsic aspirations and materialism may be a result of using material possessions to boost self-esteem or project an appealing image (e.g., Chaplin & John, 2007; Fenichel, 1938; Fournier & Richins, 1991; Kasser & Ryan, 1993, 1996). Thus, lower scores on self-esteem may be directly associated with a greater focus on extrinsic than intrinsic aspirations and materialism. However, as aspirations and materialism are expected to be indirectly
associated with lower self-esteem due to the influence of basic psychological need satisfaction, it may also be the case that there are direct relationships from both aspirations and materialism to self-esteem. Thus, rather than a one-way path, a correlation will be created between aspirations and self-esteem, and materialism with self-esteem.

Age and income will also be investigated. Kasser and Ryan (1993, 1996) previously found that the importance placed on extrinsic aspirations declines with age. Furthermore, there may have been a generational increase in extrinsic values and psychopathology (Twenge et al., 2010). Thus, older people may be less likely than younger people to place importance on extrinsic aspirations and materialism. Thus, direct paths from age to aspirations and to materialism will be created. If these paths are significant, it may suggest that age is indirectly associated with higher levels of self-esteem and wellbeing. It will also be explored whether or not older respondents have a greater orientation towards IP than DP, which may lead to age being indirectly associated with a greater focus on intrinsic than extrinsic aspirations and lower levels of materialism.

Finally, as wealth is a sign of success in a consumer culture (Dittmar, 2007; Fromm, 1976/2005; Kasser & Ryan, 1993, 1996), it will be investigated whether greater wealth leads to higher self-esteem. In addition, as increased wealth can provide additional freedom and security in life (e.g., Aknin et al., 2009; Kahneman & Deaton, 2010; see also Aristotle, 1954; Maslow, 1968), and the ability to pursue meaningful experiences (e.g., Dunn & Aknin, 2008; Guevarra & Howell, 2014; Howell et al., 2012; Van Boven & Gilovich, 2003), higher incomes may be associated with greater satisfaction of basic psychological needs. A relationship between regulation and income will not be investigated. While income may provide more
autonomy, having more money does not necessarily mean that one will internalise external rules, norms, or values based on personally meaningful justifications or understanding. It was also expected that age and income will be associated, as older individuals (e.g., who are working full time) are expected to earn more money than younger respondents who may be students.
Chapter 9: Study 1 Method and Results.

Method

Design

The aim of the first study is to assess the model displayed in Figure 1. The theory underlying this model suggests that there is a process from one’s complexity of thinking (i.e., an orientation towards either IP or DP) which may influence the extent to which importance is placed on intrinsic or extrinsic aspirations, which are expected to subsequently influence regulation, materialism, self-esteem, and wellbeing. In order to examine the various direct and indirect relationships, Structural Equation Modelling (SEM) was chosen as the most suitable form of analysis.

Participants

As extrinsic aspirations and materialism are expected to be normative within a consumer culture (see Dittmar, 2007; Gare, 1996; Kasser & Ryan, 1993, 1996; McGilchrist, 2009), it was endeavoured to obtain as close to a representative sample of the Australian population as possible.

The initial sample comprised of 536 respondents. Fifty cases were removed as they did not report demographics or complete any questionnaires in the survey. A further 31 cases completed demographics but did not complete any questionnaires and were removed, resulting in a total sample of 455. One participant also scored on the minimum for every item (i.e., selecting ‘Strongly Disagree’ for all items, including those which were negatively worded), indicating non-serious responding.

The majority of respondents were from Australia, however a small number (n = 56) of respondents from other countries also completed the survey. It was decided to remove all international respondents from the sample in order to maintain a
homogenous Australian sample. This was to ensure that all respondents may have had similar exposure to a Western consumer culture. The removal of all international respondents reduced the sample size to $N = 398$.

There were two Australian born respondents who were living in Japan at the time of completing the survey. One of these was removed, due to living in Japan for more than 10 years. The other participant had lived in Japan for less than one year, and may thus have been less influenced by Japanese culture. Two more participants had been living overseas (Canada and Philippines) for less than one year. Both were also retained in the sample. The sample therefore comprised 166 males and 231 ($N = 397$) females aged from 18 to 89 ($M = 37.54$ years, $SD = 17.65$).

**Cultural background and ethnicity.** A majority (83%) of participants were born in Australia, 3.4% in New Zealand, and 3% were born in England. The remaining respondents were born in a wide range of Asian and European nations. A majority of participants (59%) reported having lived in Australia their entire lives. A further 12% reported having lived in Australia for more than 10 years, and 5% had lived in Australia for fewer than 10 years. Twenty four per cent of respondents did not respond to this question. Finally, respondents identified with Australian (81%), English (4.6%), New Zealand (1.4%) and a range of other Asian and European cultures.

**Education.** Respondents were current undergraduate (24%) or postgraduate (9.6%) students, or had previously completed an undergraduate (17.1%) or postgraduate (9%) degree. Eighteen per cent of participants had a highest completed education level of high school, 5.5% had not completed high school, and 16.5% had completed a vocational or diploma level qualification.
**Income.** Forty per cent of the sample claimed to be earning between $0-$20,000 per annum; 26% reported yearly earnings of $20,001-$50,000, 23% reported earning $50,001-$100,000 per year, and 9% reported yearly incomes above $100,000 per year. A further 2% of respondents did not respond to this question.

**Procedure**

The survey was delivered in two formats; online and pen and paper. Both versions included identical content (see Appendix A for all questions). For the online version, participants comprised a community sample of convenience (n = 126) recruited through social networking websites (e.g., Facebook), and first year psychology students (n = 138) who were recruited through a program which requires first year psychology undergraduate students to participate in psychological research for course credit. Students were able to access a website in which all studies are presented in alphabetical order, and are able to select which study they would like to participate in. All participants were freely able to access and complete the online questionnaire at a time and place of their choosing.

Pen and paper surveys and information including the URL of the online survey were mailed out to participants who had previously participated in a nationwide telephone survey conducted by Swinburne University and consented to be contacted to participate in future research. Ninety participants completed and mailed back the pen and paper survey, and 33 participants chose to access and complete the online survey. Anonymity was ensured for both formats of the survey. Ethics approval was obtained from the Swinburne University Ethics Committee.

**Materials**
**Epistemic Preference Indicator.** The Epistemic Preference Indicator (EPI; Eigenberger et al., 2007) examines the habitual or preferred cognitive processes used in making judgements or solving problems. The EPI suggests that there are two implicit processes; Intellective Processing (IP) and Default Processing (DP). IP is generally considered to involve complex, elaborative thinking. Conversely, DP is considered to involve automatic, effortless, expedient thinking and judgement. The EPI consists of 18 paired-stems, comprising an introductory statement with two answers representing each of IP and DP. For example, the stem “In the simplest terms:” is completed by “I don’t need a deep explanation for why a lot of things happen” (DP) and “I have a strong need to study just how and why things happen” (IP). Respondents select from 1 (Disagree) to 5 (Agree) for both stem completion sentences.

Eigenberger et al. (2007) suggest that IP and DP are distinct but related constructs. Thus, scores for IP and DP are summed separately and then averaged, with each subscale having a possible range of 1-5, with higher scores reflecting a greater preference for judgement or problem solving consistent with either IP or DP. Eigenberger et al. (2007) found the IP ($\alpha = .91$) and DP ($\alpha = .90$) subscales to be highly reliable. Reliability for both subscales was also found to be excellent in the current study; IP $\alpha = .90$, DP $\alpha = .87$. Eigenberger et al. previously found that the EPI displayed criterion, as college students reported higher IP and lower DP scores than a general community sample. Construct validity displayed by higher levels of IP correlated with higher scores on need for cognition (Cacioppo & Petty, 1982), openness to experience (Costa & McCrae, 1992) and reflective thinking (Schraw et al., 1999), and lower scores on cognitive closure (Webster & Kruglanski, 1994),
dogmatism (Altemeyer, 1996), anti-intellectualism (Eigenberger & Sealander, 2001). The opposite was found in all cases for DP.

Rather than treating the EPI as separate subscales, it was decided to create an overall difference score by subtracting DP scores from IP scores to create a relative intellective processing orientation (RIPO) score. This accords with the suggestion that individuals have a general preference for either complex, effortful (i.e., IP) or expedient, effortless (i.e., DP) thinking (Eigenberger et al., 2007). A positive RIPO score indicates a preference for IP, whereas a negative score indicates a preference for DP. A score of 0 indicates no preference towards either IP or DP.

**Intrinsic and Extrinsic aspirations.** Intrinsic and extrinsic aspirations were assessed with the Aspiration Index (Grouzet, et al., 2005). It is a 47-item measure which asks about the importance of attaining certain goals in the future, consisting of 11 subscales. Five of these pertain to intrinsic aspirations: Self-acceptance (e.g., “I will choose what I do, instead of being pushed along by life”), Affiliation (e.g., “People will show affection to me, and I will to them”), Community Feeling (e.g., “I will assist people in need, asking nothing in return”), Health (e.g., “I will be in good physical shape”), and Safety (e.g., “My basic needs for food, shelter, and clothing will be met”). Four subscales measure extrinsic aspirations: Financial Success (e.g., “I will have many expensive possessions”), Image (e.g., “My image will be one others find appealing”), Popularity (e.g., “I will be admired by many people”), and Conformity (e.g., “I will live up to the expectations of my society”). Two further factors, Spirituality (e.g., “My life and actions will be in agreement with my religious/spiritual beliefs”) and Hedonism (e.g., “I will have a great sex life”), are considered neither extrinsic nor intrinsic (Grouzet et al., 2005).
Aspirations for Health and Safety were not included in the current study as these may apply to all people. Aristotle (1954) and Maslow (1968) suggest that all people need to satisfy needs for health and satisfying basic physiological needs. Furthermore, in accordance with the fallacy of misplaced concreteness (Gare, 1996; Whitehead, 1929, 1938), the focus in the current study is on those aspirations which accord with the reification of socially-created connotations (e.g., image, financial success). In addition, the two neutral aspirations for Hedonism and Spirituality were not included in the current study as the aim is to assess intrinsic and extrinsic aspirations in relation to regulation and consumer materialism.

Thus, the current study utilised a modified 31-item version of the Aspiration Index. For each item respondents are asked about how important they believe the item to be, measured on a five point scale (1 = Not at all important; 9 = Extremely important). There are numerous methods to score the Aspiration Index. Previous versions of the scale (e.g., Kasser & Ryan, 1993, 1996, 2001) have been scored by separately summing and finding the average of Intrinsic and Extrinsic items. Therefore, scores range from 0 to 9 with higher scores indicating a greater focus on aspirations of that type.

Grouzet et al. (2005) found the reliability of each subscale to be adequate; Financial Success ($\alpha = .83, .84$), Image ($\alpha = .74, .76$), Conformity ($\alpha = .62, .67$), Popularity, ($\alpha = .71, .73$), Self-acceptance ($\alpha = .73, .79$), Affiliation ($\alpha = .75, .81$), and Community Feeling ($\alpha = .71, .75$). Each subscale was found to be more reliable in the current study; Self-acceptance ($\alpha = .83$), Community Feeling ($\alpha = .74$), Affiliation ($\alpha = .81$), Image ($\alpha = .87$), Financial Success ($\alpha = .77$), Popularity ($\alpha = .78$), and Conformity ($\alpha = .80$). The overall reliability for the 16-item Extrinsic ($\alpha = .92$) and 15-item Intrinsic ($\alpha = .89$) subscales was excellent. The revised aspirations index was
also found by Grouzet et al. (2005) to be valid across 15 different nations. Adequate fitting confirmatory factor analysis (CFA) models were obtained, with measurement invariance generally obtained across samples for the tested subscales.

Rather than assessing each subscale separately, it was decided to create an overall Relative Extrinsic Value Orientation (REVO) score by subtracting the score for intrinsic aspirations from the score for extrinsic aspirations. This provides an understanding of the relative importance on individual places on extrinsic rather than intrinsic aspirations. A score of zero indicates no preference for either form of aspirations, with positive scores indicating higher levels of importance placed on extrinsic aspirations, whereas negative scores indicate a greater importance placed on intrinsic aspirations. This corresponds with the theoretical perspective underlying the model (see Figure 1), that people are generally focussed more on either intrinsic or extrinsic aspirations.

A REVO score has been created in previous studies (see Duriez, Soenens, & Vansteenkiste, 2007; Sheldon, Gunz, Nichols, & Ferguson, 2010; Sheldon & McGregor, 2000; Sheldon, Sheldon, & Osbaldiston, 2000) to assess the relative degree to which one places importance on intrinsic or extrinsic goals. Similarly, Kasser and Ryan (2001) created a relative intrinsic aspiration orientations score by subtracting mean extrinsic aspiration scores from mean intrinsic aspirations scores.

**Materialism.** Materialism was measured with the Material Values Scale (MVS; Richins, 2004) which measures the degree to which individuals ascribe importance to the ownership and acquisition of material objects. It is a 15-item scale (e.g., “I admire people who own expensive homes, cars, and clothes”) measured on a 5-point Likert scale (1 = Strongly disagree; 5 = Strongly agree). Six items which are
intended to measure non-materialistic attitudes (e.g., “I wouldn’t be any happier if I owned nicer things”) are reverse-scored so that higher scores on the MVS indicate stronger materialistic attitudes, with a possible range of scores from 15 to 75. Internal consistency of the scale has been found to be very good, \( \alpha = .87; \) Richins, which was similar in the current study, \( \alpha = .85. \)

Richins (2004) found the MVS to provide excellent fitting CFA models. Convergent validity was obtained through correlations with a number of measures. Higher MVS scores were reported by individuals who provided pro-materialism narratives. Higher MVS scores were also correlated with higher scores on the Belk (1985) materialism scale, with items developed by Richins (2004) to assess extrinsic motivation for expenditure (e.g., positive correlations with “Buy things I need or want”, and negative correlations with “Give to church organizations or charity”), and positive correlations with items associated with the perceived benefits of material acquisition (e.g., “Improves your appearance”).

**Basic Psychological Needs Scale.** According to SDT (Deci & Ryan, 1985, 2000), the basic psychological needs that ensure psychological wellbeing for all human beings are autonomy, competence, and relatedness with others. Ilardi et al. (1993) developed the Basic Psychological Needs Scale (BPNS) to assess the satisfaction of the three basic needs in work settings. Gagne (2003) modified the BPNS to measure the satisfaction of basic psychological needs in life in general. Kashdan, Julian, Merritt, and Uswitte (2006) found that higher scores on each subscale of the general BPNS were associated with greater positive affect and lower reported levels of social anxiety. Previous research using the workplace version of the BPNS has similarly shown that the satisfaction of autonomy, competence and
relatedness is associated with greater wellbeing (La Guardia, Ryan, Couchman, & Deci, 2000).

The general version of the BPNS consists of 21 items measuring autonomy (e.g., “I feel like I am free to decide for myself how to live my life”), competence (e.g., “People I know tell me I am good at what I do”), and relatedness with others (e.g., “People in my life care about me”), measured on a 7-point (1 = Not at all true; 7 = Very true) scale. Items comprising each subscale are summed and averaged, with the mean of each subscale summed to create an overall score. Higher scores represent greater satisfaction of basic psychological needs in general. Gagne (2003) found that each subscale was generally reliable; autonomy (α = .69), competence (α = .71) and relatedness (α = .71). Kashdan et al. (2006) also used the general version of the BPNS and reported similar internal consistency; autonomy (α = .61), competence (α = .83), and relatedness (α = .69). Similar reliability coefficients were obtained in the current study; autonomy (α = .66), competence (α = .60), and relatedness (α = .78). Gagne (2003) found the overall reliability of the scale to be excellent (α = .89), which was again similar in the current study (α = .86).

**General Motivation Scale.** The General Motivation Scale (GMS; Pelletier et al., 2011) was used to assess the extent to which general behaviour is autonomous and self-determined or controlled by outside motives. This scale is based on OIT (Deci & Ryan, 1985, 2000), which suggests that extrinsic motivated exists on a spectrum from amotivation, to controlled (i.e., external and introjected), to autonomous (i.e., identified and integrated), to intrinsic regulation.

The scale comprises 18 items, with three items measuring each of amotivation (e.g., “In general I do things, even though it does not make a difference whether I do
them or not”), external (e.g., “In general I do things because I want other people to view me in a positive way”), introjected (e.g., “In general I do things because otherwise I would feel guilty for not doing them”), identified (e.g., “In general I do things because I choose to make a commitment to what is important to me”), integrated (e.g., “In general I do things because they represent who I am”), and intrinsic (e.g., “In general I do things for the pleasant feelings I get while I am doing them”) regulation.

The GMS is scored by creating an overall Self-Determination Index score (Pelletier, Dion, Slovinec-D’Angelo, & Reid, 2004; Pelletier & Dion, 2007) by weighting each of the six subscales depending on their position in the self-determination continuum defined by OIT (Deci & Ryan, 1985, 2000). The weighting is as follows: intrinsic (3), integrated (2), identified (1), introjected (-1), external (-2), amotivation (-3). The equation to calculate this overall score is: GMS = 3(intrinsic) + 2(integrated) + identified – introjected – 2(external) – 3(amotivation). Pelletier et al. (2011) based this scoring method on the construct validity of a similar composite measure developed by Ryan and Connell (1989).

Pelletier and Dion (2007) used a 24-item version of the GMS and found that the six subscales of the GMS showed excellent internal consistency; amotivation (α = .77), external regulation (α = .83), introjected (α = .82), identified (α = .83), integrated (α = .92), and intrinsic (α = .89). Sharp, Pelletier, Blanchard, and Levesque (2003) found the 18-item GMS to be adequately reliable overall (α = .73), which was similar to the reported reliability (α = .78) found by Kopp and Zimmer-Gembeck (2011). In the current study the overall reliability for the GMS was very good (α = .84) with acceptable reliability of each subscale; amotivation (α = .77), external (α = .67), introjected (α = .65), identified (α = .73), integrated (α = .74) and intrinsic (α = .75).
The GMS has been found to display adequate validity. Sharp et al. (2003) found that the GMS comprised a six-factor model. Convergent validity was demonstrated as higher GMS scores (i.e., higher levels of autonomous regulation), correlated with higher levels of vitality (Ryan & Frederick, 1997), fulfilment of basic psychological needs, and general causality orientation (i.e., whether behaviour is motivated by intrinsic interest, external demands, or is amotivated; Deci & Ryan, 1985a). The GMS was also found to be consistent over time, and was predictive of self-reported success in exercising, studying, and managing emotions.

**Self Esteem.** To measure an individual’s overall sense of worth and positive self-regard, the Rosenberg Self-Esteem Scale (RSES: Rosenberg, 1989) was used. This scale comprises of 10 items (e.g., “I take a positive attitude towards myself”) measured on a 4 point scale (0 = Strongly Agree; 3 = Strongly Disagree). The measurement of the RSES was modified slightly, so that it was measured on a scale from 1 (Strongly Disagree) to 4 (Strongly Agree). This was to ensure that the rightmost option for all questionnaires in the survey represented high levels of agreement or perceived importance. It was believed that some participants may have otherwise mistakenly selected 3 (Strongly Disagree) when actually intending to suggest that they agree with the item. Thus, in the current study, scores on the RSES range from 10 to 40, with higher scores representing greater levels of self-esteem.

Findings from Blascovich and Tomaka (1993, $\alpha = .77$), Rosenberg (1986, $\alpha = .88$), Richins and Dawson (1992, $\alpha = .92$), and Sheldon and Kasser (1995, $\alpha = .88$) have also found the RSES to be highly reliable. Reliability was excellent in the current study, $\alpha = .89$.

The RSES has been found to be valid, by correlating strongly with a different measure of self-esteem (Crandall, 1973), perceptions of physical appearance,
academic ability, and general self-worth (Hagborg, 1993), and lower levels of attachment anxiety and depression (Tinakon & Nahathai, 2012). Studies have suggested that the RSES may comprise a two-factor rather than one-factor model (e.g., Marsh, 1996; Mimura & Griffiths, 2007; Shahani, Dipboye, & Phillips, 1990; Tomas & Olivier, 1999). The existence of a second factor however, may be caused by the presence of negatively worded items (Marsh, 1996; Shahani et al., 1990; Tinakon & Nahathai, 2012). Despite the concerns over the factor structure, the RSES was considered a suitable measure based on its high reliability and convergent validity.

**Wellbeing.** Three measures were used to assess aspects of wellbeing; the Subjective Vitality Scale (SVS; Ryan & Frederick, 1997), the Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985), and the depression subscale of the Depression Anxiety Stress Scale (DASS; Lovibond & Lovibond, 1995).

**Vitality.** As subjective vitality appears to be associated with the satisfaction of basic psychological needs (e.g., Nix et al., 1999; Reis et al., 2000; Ryan & Franklin, 1997), and that the current study will focus on SDT (Deci & Ryan, 1985, 2000), subjective vitality is expected to be a suitable measure of organismic wellbeing. Vitality is considered an aspect of psychological and organismic wellbeing associated with feelings of personal energy, liveliness, or vigour arising from the satisfaction of intrinsic needs (Ryan & Frederick, 1997). Accordingly, vitality has been found to be lower in extrinsically motivated individuals (Kasser & Ryan 1993, 1996; Sheldon & Kasser, 1995). Similarly, higher scores on the Subjective Vitality Scale (SVS; Ryan & Frederick, 1997) have been found to be associated with higher levels of self-esteem, self-actualization and mental health, and lower levels of various measures of ill-being (Ryan & Frederick, 2007). The SVS consists of seven items (e.g., “I feel alive and
vital”) measured on a seven point scale (1 = Not true; 7 = Very true). Scores range from 7 to 49 with higher scores indicating a greater sense of subjective vitality. Ryan and Frederick (2007) previously found the scale to be reliable ($\alpha = .84$), and it was found to be adequately reliable in the current study, $\alpha = .77$.

**Life satisfaction.** Satisfaction with life (Diener et al., 1985) will be used to assess subjective wellbeing. It tends to be used to assess subjective wellbeing over long periods of time (Steel et al., 2008), and is less susceptible than positive and negative affect to being influenced by context-dependent emotional states (Diener et al., 1999). For example, a materialistic participant who has made a recent purchase may report higher levels of positive affect than usual. The aim is to assess the enduring, long-term effect of being highly materialistic. Thus, satisfaction with life may be a more suitable measure of subjective wellbeing than affective states. The SWLS (Diener et al., 1985) examines one’s cognitive assessment of life as a whole. The SWLS consists of five evaluative judgements (e.g., “I am satisfied with life”), measured on a 7-point scale (1 = Strongly disagree; 7 = Strongly agree). Scores range from 5 to 35 with higher scores indicating greater satisfaction with life. Internal consistency of the scale has been shown to be excellent ($\alpha = .93$; Diener et al., 1985), and was $\alpha = .86$ in the current study. Diener et al. (1985) indicated that the SWLS was a valid measure by finding support for a one-factor solution, which correlated with higher scores on a range of measures assessing wellbeing and positive affect.

**Depression.** Higher levels of materialism have been suggested to contribute to depression (Seligman, 1990) and psychopathology (Twenge et al., 2010). To measure depression, the 14-item depression subscale of the 42-item DASS (Lovibond & Lovibond, 1995) was used. This measure of depression was used because it was developed using an adult, non-clinical population, which is the expected population of
the current study. The 14 items (e.g., “I felt that I had lost interest in just about
everything”) are measured on a 4-point scale from 0 (Did not apply to me at all) to 3
(Applied to me very much, or most of the time). Scores range from 0 to 42, with
higher scores indicating greater presentation of core symptoms of depression. These
include greater self-deprecation, perceived hopelessness, anhedonia, dysphoria and a
lack of interest and involvement with aspects of life. In addition, higher scores may be
indicative of greater pessimism about the future and a feeling that life is lacking in
meaning or value. The depression subscale of the DASS has previously been found to
have excellent reliability (α = .91, Lovibond & Lovibond, 1995), and was excellent in
the current study, α = .95. The depression subscale of the DASS has been found to be
valid. Using exploratory factor analyses (EFA) and CFA, Lovibond and Lovibond
(1995) found that the depression subscale was a single factor. In addition, it was
found to correlate with high scores on the Beck Depression Inventory (BDI; Beck,
Ward, Mendelson, Mock, & Erbaugh, 1961).

Results

Imputing Missing Data

Data was analysed with SPSS Version 21. Due to using pen and paper
questionnaires there was some missing data. There was a single case missing in each
of epistemic style, materialism, basic psychological need satisfaction, and regulation.
In accordance with the recommendations of Tabachnick and Fidell (2007), the data
was assessed to determine whether or not cases were missing at random. Using
Little’s MCAR test, it was found that the data was missing completely at random for
epistemic style ($\chi^2(104) = 104.41, p = .47$), materialism ($\chi^2(14) = 13.43, p = .49$),
basic psychological need satisfaction ($\chi^2(40) = 26.37, p = .95$), and regulation, $\chi^2(51)$
= 62.51, $p = .13$. Missing cases were therefore imputed with Estimated Means
provided by SPSS. This is also recommended by Tabachnick and Fidell (2007) if data is missing completely at random and there are few missing cases.

**Outliers**

The data was examined to ensure that it was suitable for Structural Equation Modelling (SEM). According to Tabachnick and Fidell (2007), a requirement for SEM is that there are no multivariate outliers. Multivariate outliers were assessed by calculating Mahalanobis’ Distance using the eleven variables intended to be used in the analyses. Four multivariate outliers were identified based on exceeding the critical Mahalanobis’ Distance score ($\chi^2(11) = 31.26, p < .001$) and were removed from the analysis. The final sample size was $N = 393$.

**Distribution of data**

Kolmogorov-Smirnov and Shapiro-Wilk test results were examined to assess the distribution of the data. In SEM, while ensuring that there are no multivariate outliers is paramount, minimal univariate and multivariate skewness is preferable (Tabachnick & Fidell, 2007). The Kolmogorov-Smirnov test results indicated that with the exception of regulation scores, all variables were significantly ($p < .01$) skewed. The Shapiro-Wilk test results indicated that with the exception of regulation, materialism, and vitality, all scales were significantly ($p < .001$) skewed.

An additional method of assessing skewness is by dividing the skewness score by the standard error of skewness with a cut-off of ±3.29 ($p < .001$). This method indicated that age (4.63), income (4.51), basic psychological need satisfaction (3.33), depression (5.36) and RIPO scores (3.89) were significantly positively skewed, whereas life satisfaction (-5.39) and self-esteem (-3.30) were significantly negatively
skewed. Thus, the sample primarily comprised younger people with lower incomes, who tended to report lower satisfaction of basic psychological needs, greater self-esteem and satisfaction with life, lower levels of depression, and a general preference for DP than IP. These results are consistent with what might be expected based on theory. For example, in a somewhat normal population (which is dominated by university students) it would be expected that a majority of people will not be clinically depressed. Furthermore, as happiness is generally consistent regardless of wealth, providing basic needs are met (see Easterlin, 1974), it is not inconceivable in a first world country like Australia to find many people who are generally satisfied with life.

Using the same method to examine kurtosis (i.e., ±3.29, \( p < .001 \)), it was found that age (3.63) and income (3.78) were not normally kurtotic. This may be the result of the skewed nature of these variables, with a majority of respondents being younger and earning low incomes. It was decided not to transform these results. While it is preferable for variables to be normally distributed for SEM, Robust Maximum Likelihood estimation can be used to account for violations of normality (Muthén & Muthén, 2010; Tabachnick & Fidell, 2007). Finally, in accordance with the requirement for all variables to display linear relationships (Tabachnick & Fidell, 2007), scatterplots were examined. All variables appeared to be linear.

**Correlations**

Prior to commencing the analyses, correlations between each variable were examined, as shown in Table 1.
Table 1

*Correlations between all variables in Study 1.*

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<td>1. Relative Intellective Processing Orientation</td>
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<td>2. Relative Extrinsic Value Orientation</td>
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<td>3. Materialism</td>
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<td>.60***</td>
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<td>4. Regulation (GMS)</td>
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<td>-.42***</td>
<td>-.31***</td>
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<td>5. Basic Psychological Need Satisfaction</td>
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<td>-.35***</td>
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<td>6. Self-esteem</td>
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<td>-.21***</td>
<td>-.28***</td>
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<td>7. Vitality</td>
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<td>.29***</td>
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<td>8. Satisfaction with life</td>
<td>-.04</td>
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<td>9. Depression</td>
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<td>.29***</td>
<td>-.34***</td>
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<td>10. Age</td>
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<td>-.16*</td>
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<td>.13*</td>
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<tr>
<td>11. Income</td>
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<td>-.08</td>
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*Note:* *** $p < .001$; ** $p < .01$; * $p < .05$
The correlations indicated that higher RIPO scores (i.e., a greater orientation towards IP than DP) were significantly associated with placing more importance on intrinsic compared to extrinsic aspirations (i.e., lower REVO scores), more autonomous regulation (i.e., higher GMS scores), and lower levels of materialism. Lower REVO scores were also associated with more autonomous regulation, and both variables were associated with lower levels of materialism. Thus, people who placed more importance on intrinsic than extrinsic aspirations and were more autonomously regulated tended to report being less materialistic. Higher levels of importance placed on extrinsic compared to intrinsic aspirations, materialism, and controlled regulation, were associated with reduced satisfaction of basic psychological needs. RIPO scores were not significantly associated with basic psychological need satisfaction. While RIPO scores were not significantly associated with self-esteem, vitality, or life satisfaction, placing more importance on intrinsic than extrinsic aspirations (i.e., lower REVO scores), lower scores on materialism, higher levels of autonomous regulation (i.e., higher GMS scores), and greater satisfaction of basic psychological needs were each associated with higher levels of self-esteem, life satisfaction, and lower levels of depression. Higher levels of vitality were only significantly associated with more autonomous regulation (i.e., higher GMS scores), greater satisfaction of basic psychological needs, and higher levels of self-esteem. Greater scores on self-esteem were also associated with greater satisfaction with life and reduced depression. Interestingly, a greater orientation towards IP than DP (i.e., higher RIPO scores) was associated with higher levels of depression. In relation to the wellbeing variables, vitality and life satisfaction shared a moderate, positive relationship, suggesting that higher levels of vitality are associated with greater satisfaction with life. Both variables were associated with lower levels of depression. The correlations also indicated that older individuals tended to have lower scores on RIPO (i.e., a greater orientation towards DP than IP), REVO (i.e., a greater orientation
towards intrinsic than extrinsic aspirations), and materialism. Older respondents also reported higher levels of autonomous regulation (i.e., higher GMS scores), greater satisfaction of basic psychological needs, and higher levels of self-esteem and vitality. There was no significant relationship between age and life satisfaction, however older respondents reported lower levels of depression.

For income, the correlations indicated that higher incomes were associated with lower RIPO scores (i.e., greater orientation towards DP than IP), greater basic psychological need satisfaction, self-esteem, vitality, and life satisfaction, and lower levels of depression. Older respondents in the sample also reported higher annual incomes than younger respondents.

**Structural Equation Modelling**

**Model testing.** Structural Equation Modelling (SEM) was performed with MPlus Version 6 (Muthén & Muthén, 2010). As it is common to obtain a significant chi-square result in SEM which would otherwise indicate a poor fitting model, a number of fit indices have been developed to account for the over-sensitivity of the chi-square statistic (Tabachnick & Fidell, 2007). In accordance with recommendations from Hu and Bentler (1999) and Kline (2005), good model fit was determined by the Comparative Fit Index (CFI; Bollen, 1989) and Tucker-Lewis Index (TLI; Tucker & Lewis, 1973) greater or equal to .95, Root Mean Square Error of Approximation (RMSEA; Browne & Cudeck, 1993) at .06 or below, and Standardized Root Mean Squared Residual (SRMR) of .08 or below.

To identify whether the sample was suitable to test the models, the minimum case to parameter ratio was examined for each model. Bentler and Chou (1987) suggest a minimum of five participants to each parameter is suitable; however Bollen (1989) and Jackson (2003) suggest a minimum of 10 cases per parameter. The hypothetical model in Figure 1 comprised
45 distinct parameters, and with a sample of $N = 393$, resulted in an acceptable case to parameter ratio of 8.73:1. In addition, because the 11 variables were skewed (Mardia’s coefficient = 6.27), the Robust Maximum Likelihood estimation method described earlier was used to adjust the parameter estimate and chi-square statistics for non-normality.

**Model results.** The hypothesised model (see Figure 1) was tested and found to be a poor fit with the data, $\chi^2(32) = 239.97$, $p < .001$, CFI = .85, TLI = .75, RMSEA = .13 (90% CI = .11-.14), SRMR = .08. A number of large, theoretically meaningful modification indices suggested modifications to the model.

The modification indices (MIs) suggested that age and depression (MI = 54.73) should be allowed to covary, and that a direct path from age to basic psychological need satisfaction (MI = 26.09) would improve the model. The path from age to BPNS was added, as older individuals may be better at satisfying basic psychological needs. For example, the finding that the importance placed on extrinsic aspirations declines with age (alternatively, that the importance placed on intrinsic aspirations increases with age; Kasser & Ryan, 1993, 1996) may indicate that older people tend to focus more on satisfying basic psychological needs than younger people. Perhaps with additional life experience, older individuals may have identified that it is important to focus on satisfying basic psychological needs rather than other goals. Alternatively, in accordance with the suggestions of Twenge et al. (2010), it may be that older individuals are from generations which emphasised the importance of intrinsic rather than extrinsic aspirations, and thus the pursuit of basic psychological needs.

In relation to depression, as society has progressed towards emphasising the importance of extrinsic aspirations more than intrinsic aspirations (e.g., Gare, 1996; Dittmar, 2007; Kasser & Ryan, 1993, 1996; Twenge et al., 2010), it may be that younger people are at greater risk of psychopathology (Twenge et al., 2010) such as depression (Seligman, 1990).
For example, as aspects of modern society emphasise individualism (Gare, 1996; Seligman, 1990), younger people may have a greater sense of isolation (i.e., not satisfying intrinsic needs for relatedness), which is a predictor of depression (Baumeister & Leary, 1995). Alternatively, it may be that younger people are at greater risk of depression due to psychosocial concerns typical of young adults such as heightened self-criticism and negative comparisons of the self based on perceptions of others (e.g., Elkind, 1967; Elkind & Bowen, 1979; Frankenberger, 2000). A third large modification index (38.43) suggested that basic psychological need satisfaction and vitality should covary. It was decided to add this correlation as the satisfaction of basic psychological needs may uniquely explain variance in vitality rather than life satisfaction or depression. In addition, it may be that individuals who have higher levels of vitality have the energy and motivation to proactively act towards satisfying their basic psychological needs.

The addition of these three paths (see Figure 2) resulted in adequate model fit, \( \chi^2(29) = 94.43, p < .001, \text{CFI} = .95, \text{TLI} = .91, \text{RMSEA} = .08 \) (90% CI = .06-.09), \( \text{SRMR} = .05 \). All fit parameter were acceptable with the exception of TLI (< .95). However, in such a complex model, the model fit was considered suitable for investigating the direct and indirect effects between the variables.
Figure 2. The modified model, with only significant paths displayed (* $p < .05$, ** $p < .01$, *** $p < .001$).
Direct effects.

**Age.** All four paths from age were significant. Older respondents tended to have lower RIPO scores (i.e., a greater orientation towards DP than IP; 4.41% variance explained), lower REVO scores indicating less importance being placed on extrinsic compared to intrinsic aspirations (6.10% variance explained), lower levels of materialism (4.63% variance explained), and greater satisfaction of basic psychological needs, accounting for 6.15% of variance.

**Income.** Higher incomes were directly associated with higher levels of self-esteem (1.72% variance explained), and greater satisfaction of basic psychological needs (1.00% variance explained).

**Relative Intellective Processing Orientation.** Higher RIPO scores significantly accounted for 17.31% of the variance in REVO scores. Thus, a greater orientation towards IP than DP was associated with placing more importance on intrinsic than extrinsic aspirations (i.e., lower REVO scores). The direct path from RIPO scores to regulation was not significant.

**Relative Extrinsic Value Orientation.** Higher REVO scores were significantly associated with higher levels of materialism (31.70% variance explained) and lower regulation (i.e., GMS) scores (15.29% variance explained). Therefore, higher levels of importance placed on extrinsic compared to intrinsic aspirations (i.e., higher REVO scores) were significantly associated with higher levels of materialism and controlled regulation. The third direct path from REVO scores to basic psychological need satisfaction was not significant.
**Basic Psychological Need Satisfaction.** Greater satisfaction of basic psychological needs was directly associated with higher self-esteem, accounting for 10.69% of variance.

**Materialism.** Of the two paths from materialism, only the negative path to BPNS scores was significant, accounting for 3.35% of variance. Higher levels of materialism were therefore directly associated with less satisfaction of basic psychological needs.

**Self-esteem.** The direct path from self-esteem to wellbeing was significant, explaining 55.50% of variance. Therefore, individuals with higher levels of self-esteem are likely to report higher levels of vitality, life satisfaction and lower levels of depression.

**Covariances.** Income and age shared 9.92% of variance. As would be expected, older respondents tended to have higher incomes. Age and depression significantly shared 19.54% of variance, indicating that older respondents tended to report lower levels of depression. The final correlation suggested that greater satisfaction of basic psychological needs was associated with higher levels of vitality, explaining 19.01% of variance. The correlations between materialism and aspirations with self-esteem were not significant.

**Indirect effects.**

**Indirect paths from epistemic style to wellbeing.** There were five significant indirect paths indicating that a greater orientation towards IP than DP was indirectly associated with higher levels of wellbeing. The first path indicated that a greater orientation towards IP than DP (i.e., higher RIPO scores) resulted in a greater focus on intrinsic than extrinsic aspirations (i.e., lower REVO scores), leading to lower levels of materialism, greater satisfaction of basic psychological needs and greater wellbeing. This pathway accounted for .84% (indirect effect = .01, \( p < .05 \)) of the variance in wellbeing.
The next path suggested that a greater orientation towards IP than DP was associated with placing more importance on intrinsic than extrinsic aspirations, leading to more autonomous regulation, greater basic need satisfaction, and higher wellbeing. This pathway accounted for 1.00% (indirect effect = .01, \( p < .01 \)) of the variance in wellbeing.

The third path, which accounted for 4.92% (indirect effect = .05, \( p < .001 \)) of the variance in wellbeing, suggested that a greater epistemic preference for IP over DP was associated with placing comparatively more importance on intrinsic than extrinsic aspirations, leading to higher levels of autonomous regulation, greater self-esteem, and higher levels of wellbeing.

The fourth significant indirect path suggested that a greater orientation towards IP than DP resulted in placing more importance on intrinsic than extrinsic aspirations, leading to lower levels of materialism, greater satisfaction of basic psychological needs, higher levels of self-esteem, and higher levels of wellbeing. This path accounted for 1.04% (indirect effect = .01, \( p < .01 \)) of the variance in wellbeing.

The final significant indirect pathway again commenced with a greater orientation towards IP than DP leading to placing more importance on intrinsic than extrinsic aspirations. This then resulted in higher levels of autonomous regulation, greater satisfaction of basic psychological needs, higher levels of self-esteem, and greater subsequent levels of wellbeing. This pathway accounted for 1.25% (indirect effect = .01, \( p < .001 \)) of the variance in wellbeing.

**Indirect paths from age to wellbeing.** There were 12 indirect pathways from age to wellbeing. As there was a direct negative path between age and RIPO scores (i.e., a preference for DP rather than IP), the indirect pathways including age and RIPO scores suggested that age was indirectly associated with lower levels of wellbeing. For all other
indirect paths which did not include RIPO scores, age appeared to be indirectly associated with higher levels of wellbeing.

The first indirect pathway suggested that older respondents reported greater satisfaction of basic psychological needs which resulted in greater wellbeing (indirect effect = .05, $p < .01$, 4.84% variance explained). An extension of this path, suggesting that basic need satisfaction leads to greater self-esteem, suggested that age was indirectly associated with greater wellbeing (indirect effect = .06, $p < .001$, 6.04% variance explained).

The third indirect pathway suggested that older respondents were less materialistic, leading to greater satisfaction of basic psychological needs and greater wellbeing. This pathway accounted for .77% (indirect effect = .01, $p < .05$) of the variance in wellbeing. A similar path including age, lower levels of materialism, greater basic psychological need satisfaction, and higher levels of self-esteem, accounted for .93% (indirect effect = .01, $p < .01$) of the variance in higher levels of wellbeing.

A fifth indirect path suggested that older respondents placed more importance on intrinsic than extrinsic aspirations, leading to more autonomous regulation, greater satisfaction of basic psychological needs, and higher levels (indirect effect = .01, $p < .05$, .59% variance explained) of wellbeing. A similar path included age, greater importance placed on intrinsic than extrinsic aspirations, higher levels of autonomous regulation, and higher levels of self-esteem. This path accounted for 2.92% (indirect effect = .03, $p < .001$) of the variance in higher wellbeing scores. An eighth path included age, aspirations, lower levels of materialism, greater basic need satisfaction, higher self-esteem and higher (indirect effect = .01, $p < .01$, .62% variance explained) wellbeing. Another significant indirect path included age, aspirations, autonomous regulation, greater basic need satisfaction, higher self-esteem and greater wellbeing, indirect effect = .01, $p < .01$, .74% variance explained.
The remaining four indirect pathways indicated that age was indirectly associated with lower levels of wellbeing. For each pathway, age was associated with having a preference for DP rather than IP (i.e., lower RIPO scores), leading to a greater focus on extrinsic than intrinsic aspirations (i.e., higher REVO scores). This resulted in more controlled regulation (i.e., lower GMS scores), poorer satisfaction of basic psychological needs and reduced wellbeing, (indirect effect = -.002, \( p < .05 \), .21% variance explained). Alternatively, more controlled regulation, lower levels of self-esteem, and reduced wellbeing, (indirect effect = -.01, \( p < .05 \), 1.03% variance explained). A third path including age, epistemic style, and aspirations, also included higher levels of materialism, reduced satisfaction of basic psychological needs, and lower levels of self-esteem. This indirect pathway accounted for .22% of the variance in wellbeing, indirect effect = -.002, \( p < .05 \). The final indirect pathway included age, epistemic style, and aspirations, and also included higher levels of controlled regulation, reduced satisfaction of basic psychological needs, lower levels of self-esteem, and lower levels of wellbeing. This pathway accounted for .26% (indirect effect = -.003, \( p < .01 \)) of the variance in wellbeing.

**Indirect paths from income to wellbeing.** There were two significant paths from income to wellbeing. The first suggested that higher incomes were associated with greater self-esteem, leading to greater levels of wellbeing, (indirect effect = .10, \( p < .01 \), 9.76% variance explained). The second path suggested that higher incomes lead to greater satisfaction of basic psychological needs, leading to higher self-esteem and greater wellbeing. This path accounted for 2.44% (indirect effect = .02, \( p < .05 \)) of the variance in wellbeing.
Chapter 10: Study 1 Discussion

The aim of the first study was to investigate whether an epistemic orientation towards IP than DP would be indirectly associated with higher levels of wellbeing as a result of placing more importance on intrinsic than extrinsic aspirations, lower levels of materialism, and higher levels of autonomous regulation, basic psychological need satisfaction and self-esteem. The indirect relationships between both age and income with wellbeing were also investigated.

It was anticipated that individuals who are less complex in their thinking (i.e., a greater orientation to DP than IP) would consider extrinsic aspirations to be more important than extrinsic aspirations, as doing so is part of the status quo in contemporary Western society (e.g., Dittmar, 2007; Gare, 1996; Kasser & Ryan, 1993, 1996). It was also expected that a greater focus on intrinsic than extrinsic aspirations would be directly associated with lower levels of materialism and greater levels of autonomy, and indirectly associated with greater satisfaction of basic psychological needs, self-esteem, and wellbeing (i.e., greater vitality and life satisfaction, and lower levels of depression). It was also expected that income may contribute to greater satisfaction of basic psychological needs and self-esteem, and the influence of age was also investigated.

The results of bivariate correlations were generally in line with expectations. Contrary to expectations however, the correlations suggested that older respondents reported an orientation towards DP rather than IP (i.e., lower RIPO scores). As a result, a direct path from age to RIPO was included in the SEM analyses, as older people may have a different way of thinking about situations than younger people (see Loevinger, 1976, 1987). The SEM results generally supported the aforementioned expectations.
First, a direct, negative path from RIPO scores to REVO scores was found, indicating that individuals with an orientation towards IP rather than DP (i.e., higher RIPO scores) placed comparatively more importance on intrinsic than extrinsic aspirations (i.e., lower REVO scores). Thus, as expected, individuals who are more complex in their thinking may be more likely to reject normative extrinsic aspirations which may arise in accordance with the fallacy of misplaced concreteness (Gare, 1996; Whitehead, 1929, 1938) in a consumer culture (DeBord, 1995; Dittmar, 2007; Fromm, 1976/2005; Kasser & Ryan, 1993, 1996).

It was also expected that individuals with a greater orientation towards IP than DP would be more autonomous in their regulation, potentially as a result of being able to develop greater levels of understanding and meaningfulness (i.e., identified regulation). It was found that a direct path from RIPO to regulation (i.e., GMS scores) was not significant. Thus, while higher levels of IP may represent higher levels of complex thought (Eigenberger et al., 2007), it may not directly result in being more autonomously regulated. The indirect pathways from RIPO scores to wellbeing (which will be discussed later), indicated that a greater orientation towards IP than DP was indirectly associated with higher levels of autonomous regulation as a result of placing greater levels of importance on intrinsic compared to extrinsic aspirations.

It was anticipated that placing more importance on extrinsic than intrinsic aspirations (i.e., higher REVO scores) would be directly associated with higher levels of controlled regulation (i.e., lower GMS scores), as the demands to pursue extrinsic aspirations can be controlling (e.g., Aknin et al., 1999; Ryan, 1995; Schor, 1992, 1998). Higher REVO scores were also expected to be directly associated with reduced satisfaction of basic psychological needs and higher levels of materialism. The model indicated that placing more importance on extrinsic than intrinsic aspirations was directly associated with controlled regulation and increased materialism, and as a result, indirectly but not directly associated with reduced basic psychological need satisfaction. The model also indicated that, as expected, lower
levels of materialism and higher levels of autonomous regulation were associated with greater satisfaction of basic psychological needs.

As expected on the basis of theory (Deci & Ryan, 1985a; Ilardi et al., 1993; see also Deci & Ryan, 2000), higher levels of autonomous regulation and basic psychological need satisfaction were directly associated with higher levels of self-esteem. As expected, higher levels of basic psychological need satisfaction and self-esteem were also directly associated with greater wellbeing. Contrary to expectations, materialism was not directly associated with wellbeing. However, as materialism was directly associated with reduced satisfaction of basic psychological needs, it was also indirectly associated with lower levels of self-esteem and wellbeing. This is in accordance with previous research which has found that materialism is associated with reduced wellbeing (see Dittmar et al., 2011; Wright & Larsen, 1993 for reviews) and self-esteem (e.g., Braun & Wicklund, 1988; Fenichel, 1938; Fournier & Richins, 1991; Heilbroner, 1956; Kasser & Ryan, 1996, 2001). Despite this, contrary to expectations, aspirations and materialism did not significantly covary with self-esteem.

Overall, these significant direct and indirect relationships suggested that higher levels of IP compared to DP were indirectly associated with higher levels of wellbeing due to the mediating influence of placing more importance on intrinsic than extrinsic aspirations, lower levels of materialism, increased autonomous regulation, greater satisfaction of basic psychological needs, and higher self-esteem.

The model also indicated that, in accordance with expectations, higher incomes were associated with increased age, greater satisfaction of basic psychological needs and self-esteem. Higher incomes were therefore indirectly associated with increased wellbeing. This supports the conceptualisation of money as a necessity to satisfy basic psychological and physiological needs (Aristotle, 1954; Maslow, 1968), the means to purchase meaningful
products or experiences (e.g., Dunn & Aknin, 2008; Guevara & Howell, 2014; Howell et al., 2012; Van Boven & Gilovich, 2003), as well as being a quantifiable means of determining self-worth (Dittmar, 2007; Fromm, 1976/2005; Marx, 1844/1964, 1973, 1976). Thus, in accordance with Srivastava et al. (2001), Carver and Baird (1998), and Garðarsdóttir et al. (2009), money may not be an inherently negative influence on wellbeing. However, as the findings pertaining to aspirations in the current model indicate, money may become a negative influence if it is sought after predominantly for extrinsic rather than intrinsic reasons.

The final aim of the model was to investigate the influence of age. In accordance with previous findings from Kasser and Ryan (1993, 1996) and the suggestion that there has been an increasing generational emphasis on extrinsic aspirations and materialism (Twenge et al., 2010), it was expected that older respondents would report lower REVO scores (i.e., a greater focus on intrinsic than extrinsic aspirations) and lower levels of materialism than younger respondents. Accordingly, the model indicated that increased age was indirectly associated with higher levels of self-esteem and wellbeing as older respondents appeared to report placing less importance on extrinsic compared to intrinsic aspirations, which subsequently resulted in higher levels of autonomous regulation and reduced materialism, and greater direct satisfaction of basic psychological needs. Despite this, as increased age was associated with a preference for DP rather than IP, the model paradoxically suggested that increased age was also simultaneously indirectly associated with reduced wellbeing due to lower self-esteem, reduced satisfaction of basic psychological needs, higher materialism, controlled regulation, and placing more importance on extrinsic than intrinsic aspirations. These indirect relationships were the result of the negative direct association between age and lower RIPO scores (i.e., a greater orientation towards DP than IP). This is expected to be unlikely, as, in accordance with modification indices, a correlation was added between age and depression.
This relationship was significant and indicated that increased age was associated with lower levels of depression. The paradoxical nature of the indirect pathways however, suggests that epistemic style alone may not be sufficient to understand the underlying reasons explaining why certain individuals may choose to primarily focus on extrinsic, materialistic goals in life.

Considerations for Study 2

While a majority of findings were in accordance with expectations and previous research, the finding that older respondents placed less importance on extrinsic aspirations and materialism, but were also more likely to have lower RIPO scores indicating a greater orientation towards DP, was unexpected on the basis of theory. It was argued for example, that as extrinsic aspirations may exist as a result of the fallacy of misplaced concreteness (Gare, 1996; Whitehead, 1929, 1938) and as normative values within a consumer culture (e.g., DeBord, 1995; Dittmar, 2007; Kasser & Ryan, 1993, 1996), individuals who are more complex in their thinking (i.e., higher RIPO scores) may be able to consider, question, and reject extrinsic, materialistic goals strivings. While the results supported this (i.e., higher RIPO scores were associated with lower REVO scores, indicating an orientation towards intrinsic rather than extrinsic aspirations), it is seemingly inconsistent for older people to have an orientation towards DP rather than IP and simultaneously, as expected, emphasise intrinsic over extrinsic aspirations. There are two potential explanations for this finding.

First, in accordance with the suggestion of Twenge et al. (2010), there may be generational differences in materialism and the importance placed on extrinsic aspirations. The social or cultural norm for older respondents may be to focus on intrinsic rather than extrinsic aspirations. Furthermore as they are older and may have settled into set ways of comprehending and understanding themselves, others, and society in general (see Loevinger, 1976, 1987), they do not feel the need to think about things in a complex manner, thus
leading to an orientation towards DP rather than IP. Additionally, older people may, as a result of life experience, have developed a different way of looking at the world which de-emphasises the importance of extrinsic aspirations and materialism, and operates independent of epistemic style. Thus, older people may have a different metaphysical orientation to life than younger people.

Metaphysics are a set of assumptions about the general structure, order and nature of existence. All people have a metaphysics which influence the inferences and conclusions derived from observations (Gare, 1996). Gare (1996) and McGilchrist (2009) suggest that there has been an increasing shift towards mechanistic perspectives in contemporary Western civilisation, which emphasise individualism and quantifiable means such as money and material gain as primary sources of determining value or meaning in life. Thus, it may be that older people are less mechanistic than younger people, and as a result, place less importance on extrinsic, materialistic goals. Alternatively, based on Loevinger’s (1976, 1987) work on ego development, those who have attained higher levels of ego development tend to be older. These higher ego stages downplay the importance of conforming to social norms which may emphasise extrinsic, materialistic goals and values (Dittmar, 2007; Kasser & Ryan, 1993, 1996, 2001). Therefore, older individuals may be more likely to have transcended mechanistic social norms. Alternatively, in accordance with Twenge et al. (2010), it may be that older people were raised in a period of time in which mechanistic thinking was less prevalent; the generational increase in materialism may have been a result of a generational increase in mechanism (see Gare, 1996; McGilchrist, 2009).

Thus, while many of the findings in Study 1 were generally in line with expectations, the examination of underlying metaphysical perspectives or orientations may provide a better understanding of why people focus on intrinsic or extrinsic aspirations and materialism, and how these relate to regulation and wellbeing. The second study of this thesis will explore of a
range of philosophical and psychological literature to elucidate the dominant, underlying metaphysical perspectives in contemporary Western civilisation.
Chapter 11: The introduction of holistic and mechanistic thinking

What are metaphysics?

All people have metaphysical perspectives which provide assumptions about the structure, order, and nature of existence. These assumptions subsequently influence the inferences and conclusions people make based on their observations (Gare, 1996). Similar to the basic needs suggested by SDT (Deci & Ryan, 1985; 2000), Gare (1996) suggests that metaphysics provide the means through which individuals can orient themselves to society (i.e., relatedness with others), to live and act in such a way to attain recognition and respect from others (i.e., competence), and to attain control over life within a framework of one’s convictions and understandings of the world (i.e., autonomy). These metaphysical views provide one’s dominant view of the nature of reality, and are reinforced and constituted through all levels of society (Gare, 1996; McGilchrist, 2009). Metaphysics are conceptually similar to previous work on worldviews.

The term worldview refers to one’s view or perspective on the world or the universe (Wolman, 1973). Worldview has also been conceptualised as the interpretive lens through which one understands and comprehends reality (Miller & West, 1993), the assumptions about the world which influence our perception and understanding (Overton, 1991), or a socially constructed reality which influences perception and experience (Redfield, 1952). Worldviews influence ways of describing the world and all life within it (Koltko-Rivera, 2000, 2004), and how one relates to others and to the environment (Johnson, Hill, & Cohen, 2011). This includes beliefs and assumptions about what the world is, what exists within it, and what types of experiences, behaviours and relationships are acceptable or not (Koltko-Rivera, 2000, 2004). All people have a worldview which informs how all things are considered (Sarason, 1984). Thus, all awareness, interpretation, and understanding of reality
is influenced by the assumptions informed by one’s worldview (Kluckhohn & Stroedtbeck, 1961/1973), or metaphysics (Gare, 1996; McGilchrist, 2009).

**Which metaphysics?**

Whitehead (1929, 1938) suggested that there are two dominant, yet ontologically different ways of looking at reality. The first perspective emphasises a dynamic, ever-changing reality, whereas the other considers reality to be static. Whitehead suggested that these perspectives influence the epistemological approach used to understand the nature of reality. For example, whether reality is best investigated and understood through the quantifiable measurement of unchanging dispositions or assessing dynamic processes. Gare (1996) and McGilchrist (2009) argue that the static, dispositional perspective has become the dominant perspective in Western civilisation. Both authors refer to this as mechanistic thinking. In short, mechanism emphasises a static, unchanging reality with a focus on quantifiable outcomes. In contrast is holistic thinking, which emphasises a view of all things as being inherently interconnected and embedded within broader, ever-changing wholes.

There is evidence for differences in thinking based on holistic or mechanistic perspectives in Ancient Greek philosophy (see Gare, 1996), and in the differences between Westerners and East Asians (see Nisbett, 2003 for a review). McGilchrist (2009) suggests that the left hemisphere of the brain is largely responsible for mechanistic perspectives, whereas the right hemisphere is largely responsible for more holistic, context-dependent ways of thinking. Furthermore, McGilchrist suggests that the increasing shift towards mechanistic thinking in Western civilisation is the result of increasing importance being placed on the left hemisphere’s view of the world.

**Influence of the two hemispheres**
McGilchrist (2009) suggests that the brain has evolved with two hemispheres as each serves a different purpose. Early research on hemispheric differences, particularly that emanating from research on individuals who had their corpus collosum severed as part of split-brain operations (e.g., Levy-Agresti & Sperry, 1968; Sperry, 1974, 1982), considered the left hemisphere to be the ‘major’ hemisphere, responsible for language and reason, whereas the ‘minor’ right hemisphere was largely mute and irrelevant (Sperry, Gazzaniga, & Bogen, 1969; see also McGilchrist, 2009 and Ornstein, 1997 for reviews). For example, if a photograph (i.e., of snow) is presented to the left visual field (processed in the right hemisphere), of a split-brain patient, they could move their left hand (using the right hemisphere) to select another relevant photograph (i.e., a shovel), but could not explain why they had made that decision. The right hemisphere was unable to verbally articulate the decision-making process (Gazzaniga & LeDoux, 1978). Despite primacy of left-hemispheric functioning for language in many people, the right hemisphere is still involved (Levy, 1983; Zaidel, 1983). Language, for example, is primarily in the left hemisphere for many individuals, as Broca’s and Wernicke’s areas are involved in articulating words and sentences. Speech however, also involves recalling memories and modulating one’s tone of voice, and these aspects of speech are drawn from other parts of the brain (McGilchrist, 2009).

McGilchrist (2009) suggests that the role of the corpus collosum provides evidence for each hemisphere of the brain being responsible for different tasks. The corpus collosum has been found to have two roles; to allow and inhibit communication between the two hemispheres (Cook, 1984; Hoptman & Davidson, 1994; Meyer, Röricht, Gräfin von Einseidel, Kruggel, & Weindl, 1995; Meyer, Röricht, & Woicieichowsky, 1998). Furthermore, research has also found that the corpus callosum tends to decrease in size as brain size increases (Jäncke & Steinmetz, 2003), and as asymmetry between the hemispheres
becomes more pronounced (Hopkins & Marino, 2000). This suggests that the brain has evolved to comprise two autonomous systems (Friedman & Polson, 1981). Accordingly, despite the human skull and cranium being largely symmetrical, the two hemispheres of the brain are not. Yakovlevian torque (Yakovlev & Rakić, 1966) is the term given to the skewed appearance of the brain. It is larger at the right, frontal lobe and the left, posterior lobe. The importance of the extended right anterior lobe of the brain is that the frontal lobe is associated with inhibition. It is by restricting action that humans are able to live in complex societies. This point is key to autonomous regulation; the internalization of external rules, laws, or norms so that an individual willingly restricts their behaviour in order to maintain social harmony (Deci & Ryan, 1985, 2000; Ryan, 1995). This ability, in combination with the right hemisphere’s capacity for seeing the ‘big picture’, interrelatedness, context, and the ability for empathy and emotional understanding (McGilchrist, 2009; Ornstein, 1997), provides humans with the ability to ‘stand back’ from the immediacy of experience and to consider things objectively or from the perspective of another person (McGilchrist, 2009). Research has identified a number of differences between the two hemispheres.

**Differences in context and perspective**

**Breadth vs Focus.** McGilchrist (2009) suggests that the right hemisphere is associated with broad, open thinking, alertness and vigilance, whereas the left hemisphere is adept at attention to detail and narrowly focussed attention. Navon (1977) suggests that perception begins with global processing, which enables the ability to focus on specific aspects. Van Zomeran and Brouwer (1994) suggest that there are five distinct types of attention in humans; vigilance, sustained attention, alertness, focussed attention, and divided attention. These are divided into two components; intensity and selectivity. Intensity is comprised of alertness, vigilance, and sustained attention. Selectivity is comprised of focussed and divided attention. The right hemisphere appears to be involved in alertness and
sustained attention (Lewin et al., 1996; Sturm et al., 1999; Sturm & Willmes, 2001). Vigilance and sustained attention are impaired in those with right-hemisphere legions (i.e., the left hemisphere is dominant), whereas vigilance is unaffected in those with left-hemispheric legions who thus primarily rely on their right hemisphere (Korda & Douglas, 1997). Those with right-hemispheric damage who rely on their left hemispheres have been observed to have difficulty in increasing the breadth of their attention, with a tendency to remain fixated on smaller parts or details (Leclercq, 2002).

Focussed attention which appears to be the result of the left hemisphere (Godefroy & Rousseaux, 1996), is impaired in those with injury to the left hemisphere (Benton & Joynt, 1959; Dee & van Allen, 1973). For divided attention, it appears the right hemisphere is dominant (Corbetta, Miezen, Dobmeyer, Shulman, & Petersen, 1991; Vohn et al., 2007), although other studies suggest that both hemispheres are equally involved (Godefroy & Rousseaux, 1996; Godefroy, Lhullier, & Rousseaux, 1996). Therefore, McGilchrist (2009) contends that the right hemisphere is responsible for all forms of attention except focussed attention.

**Integration vs Division.** McGilchrist (2009) also suggests that the right hemisphere tends to see the big picture whereas the left hemisphere tends to focus on localised or short-term aspects. This occurs as a result of the right hemisphere’s ability to attend to things broadly and to also integrate a range of stimuli or ideas. The right hemisphere, which has a better capacity for working memory than the left (Kirsner, 1980), appears to be better at integrating perceptual information from different senses than the left hemisphere (Goldberg & Costa, 1981; Semmes, 1968). Levy-Agresti and Sperry (1968) also suggested that the left hemisphere is not as capable of integrating sensory perception and aspects of memory to create a rich, complex view of the world as the right hemisphere.
**Context vs abstraction.** The right hemisphere considers things in context by understanding them based on their relationships with aspects of the world rather than seeing them as isolated entities (Federmeier & Kutas, 1999; Kinsbourne, 1982; McGilchrist, 2009; Ornstein, 1997). This is also evident in language, in which the right hemisphere is important in understanding things within context (Heilman, Scholes, & Watson, 1975), such as the intent of speech (Kaplan, Brownell, Jacobs, & Gardner, 1990).

McGilchrist (2009) also suggests that as the left hemisphere often considers things outside of their real-world contexts, it is responsible for developing abstractions (Federmeier & Kutas, 1999; Kinsbourne, 1982). In contrast, the right hemisphere appears to be better at processing concrete experience rather than abstract ideas (Warrington & Taylor, 1973). This capacity of the left hemisphere provides the ability to create invariant classifications through which to categorise or differentiate things (Marsolek, 1995), such as developing the superordinate category of ‘dog’ within which all dogs are categorised. The left hemisphere thus focusses on single characteristics that enable things to be categorised whereas the right hemisphere identifies exemplars and considers them in relation to their similarities with other unique entities (Burgund & Marsolek, 2000; Koivisto & Laine, 1999; Laeng, Chabris, & Kosslyn, 2003; Laeng, Shah, & Kosslyn, 1999; Yamazaki, Aust, Huber, Hausmann, & Gunturkun, 2007). Thus, as the right hemisphere views things within their context, it often considers personal characteristics, whereas the focus on abstract categories tends to make the left hemisphere more impersonal (Van Lancker, 1991).

**Whole vs parts.** The right hemisphere views the big picture before isolating parts to consider separately, whereas the left hemisphere starts with isolated parts which are combined to create a whole (Bradshaw & Nettleton, 1981; Ornstein, 1999). Furthermore, individuals with right hemispheric legions who solely rely on their left hemisphere tend to start with pieces which are combined to create a whole. In contrast, those with left
hemispheric legions who primarily utilise their right hemisphere use a global approach (Delis, Robertson, & Efron, 1986; Delis, Kiefner, & Fridlund, 1988; Siéroff, 1990; Halligan & Marshall, 1994). Additional research has found that those with right hemispheric damage often lose an ability to comprehend Gestalts or the whole. For example, if asked to draw a person, individuals with this sort of brain damage tended to draw parts (e.g., limbs, torsos) that were accurate but not as part of a meaningful whole that represents a person. Those with damage to the right hemisphere however, can draw objects (e.g., a tree) which look correct overall, but lack specific details (Warrington, James, & Kinsbourne, 1966; Nikolaenko, 2004). Thus, the right hemisphere may provide ‘wholeness’, whereas the left hemisphere appears to provide detail for specific parts. For example, the whole body is processed by the right hemisphere, whereas body parts are processed by the left hemisphere (Gainotti, 2000).

**Dealing with change.**

*New vs known.* The right hemisphere is involved in understanding new information or experiences (Goldberg & Costa, 1981; Goldberg, Podell, & Lovell, 1994). Hippocampal changes occur in the right but not the left hemisphere in response to novel stimuli. The right hemisphere is also involved in attending to unexpected peripheral visual stimuli regardless of which side of the visual field the stimuli appears (Schutz, 2005). It has also been observed that once skills have been mastered, they tend to involve higher levels of left hemispheric functioning (Bever & Chiarello, 1974; Goldberg, 2001), indicating that the left hemisphere is involved with processing information which is already known or expected (Phelps & Gazzaniga, 1992; Podell, Lovell, Zimmerman, & Goldberg, 1995). The left hemisphere is thus more efficient than the right when dealing with things that are already known or predictable, but it less capable than the right hemisphere at revising knowledge in light of new situations or perspectives (Brownell, Potter, Bihrle, & Gardner, 1986).
**Possibility vs predictability.** The right, frontal lobe appears to be important in one’s flexibility of thought (Vanderhasselt, De Raedt, Baeken, Leyman, & D’haenen, 2006) and in inhibiting immediate responses (Konishi et al., 1999). Individuals with damage to their right, frontal lobes have been found to have difficulty in flexibly responding to change (Razani, Boone, Miller, Lee, & Sherman, 2001). For example, after finding a successful solution to a problem, individuals with right frontal lobe damage (i.e., that now need to rely primarily on their left hemisphere) will continue to apply that solution to problems that require a different approach. The left hemisphere tends to stick to established approaches based on prior knowledge, whereas the right hemisphere considers a range of possible approaches or solutions (Brownell, Simpson, Bahrle, Potter, & Gardner, 1990).

**Differences in classification.**

**Individuals vs categories.** The right hemisphere views things as being individual and unique, whereas the left hemisphere often considers general, non-specific categories. Accordingly, the right hemisphere tends to be responsible for distinguishing between unique stimuli, such as faces (Bougeois, Christman, & Horowitz, 1998) or different people (Marsolek, Schacter, & Nicholas, 1996). The right hemisphere is thus adept at distinguishing between living and non-living entities (Marsolek et al., 1996; McGilchrist, 2009). This tends to be at the level of subordinate categories (e.g., a Robin), whereas the left hemisphere is faster at processing general, superordinate categories (e.g., a Bird; Laeng, Zarrinpar, & Kosslyn, 2003).

**Living versus non-living.** Ehrenwald (1931) described a patient who had damage to the right hemisphere. This patient, when talking of his own body, considered it to comprise of scaffolding, wooden planks and compartments that operated in a mechanical manner. There is some evidence to suggest that the left hemisphere is activated more by stimuli related to
inanimate objects like tools rather than animate objects like animals (Damasio, Grabowski, Tranel, Hichwa, & Damasio, 1996; Martin, Wiggs, Ungerleider, & Haxby, 1996; Perani et al., 1995).

**Identifying emotions, and the capacity for empathy.** The right prefrontal cortex is responsible for recognising one’s voice and face (Keenan, McCutcheon, & Pascual-Leone, 2001; Sugiura et al., 2000). The right temporal region of the brain processes information or experiences that directly relates to human life, such as recognising familiar people (Gainotti, Barbier, & Marra, 2003). The ability to recognise faces appears to be impaired in those with damage to the right hemisphere (Sergent & Villemure, 1989). The right orbitofrontal cortex which is important for social and empathic understanding is larger in primates than the equivalent part of the left hemisphere (Falk et al., 1990). Social development also occurs prior to the development of language in humans (Bates & Dick, 2002), which is typically located in the left hemisphere, suggesting the importance of the right hemisphere (McGilchrist, 2009). The right hemisphere is more involved in processing facial emotion (Suberi & McKeever, 1977), and nonverbal emotional expressions (e.g., facial expression, gesticulation; Blonder, Bowers, & Heilman, 1991) than the left hemisphere. The right hemisphere appears to be involved in understanding subtle emotional cues from the eyes whereas the left hemisphere focusses more on the mouth. For this reason, the right hemisphere is better at detecting when others are being deceptive (Prodan, Orbelo, Testa, & Ross, 2001). Furthermore, despite the primacy of the left hemisphere in language, the emotional content of written language (Cicero et al., 1999) and speech (Sim & Martinez, 2005) is primarily the domain of the right hemisphere (see also Nagae & Moscovitch, 2002). In addition, the right hemisphere is responsible for processing subtle, indirect meanings, such as those implied with irony or sarcasm (Shamay-Tsoory, Tomer, Berger, Goldsher, &
Aharon-Peretz, 2003). Individuals with right-hemispheric damage have difficulty understanding non-literal metaphoric meaning (Winner & Gardner, 1977).

Research has also indicated that the right hemisphere is largely involved with one’s theory of mind (i.e., the ability to consider a situation from another person’s perspective; Happé, Brownell, & Winner, 1999), emotional understanding (Sperry, Zaidel, & Zaidel, 1979; Voeller, 1986) and helps guide social behaviour (Mychack, Kramer, Boone, & Miller, 2001). Furthermore, individuals who have suffered damage to the right frontal become incapable of empathy (Miller, Chang, Mena, Boone, & Lesser, 1993). The right hemisphere also appears to be responsible for feeling the pain of others (Jackson, Brunet, Meltzoff, & Decety, 2006). Despite this, mirror neurones which enable imitation or the ability to understand the intentions of other people are evident in both hemispheres (Aziz-Zadeh, Koski, Zaidel, Mazziota, & Iacoboni, 2006). In line with the right hemisphere’s focus on human-focussed stimuli, mirror neurons in the left hemisphere often correspond to instrumental, object-based imitation (i.e., moving one’s fingers in accordance to the movement of an on-screen icon), whereas the right hemisphere appears to be activated more strongly when imitating biological movements (e.g., copying someone else moving their fingers; Biermann-Ruben et al., 2008).

**Reason, logic and rationality.** McGilchrist (2009) suggests that the dominant stereotype of the left hemisphere as being rational, whereas the right hemisphere is more creative is incorrect. Rather, both hemispheres are rational and creative, but have different means through which those aspects are expressed based on the extent to which each hemisphere considers contextual factors or provides the capacity to empathise or see things from another’s’ perspective. McGilchrist thus argues that for reason, imagination or any other broader cognitive ability, people constantly and simultaneously use both hemispheres of the brain. As evidence that both hemispheres are involved in logical or rational tasks, damage to
either the left or right hemisphere has been found to decrease mathematical ability (Ashcraft, Yamashita, & Aram, 1992; Jackson & Warrington, 1986). The right hemisphere appears to be important in managing abstract numerical relations (Langdon & Warrington, 1997), and those who are particularly skilled at mathematics utilise the right hemisphere’s ability for episodic memory (Pesenti et al., 2001). Both hemispheres also appear to be involved in aspects of deductive reasoning (Knauff, Fangmeier, Ruff, & Johnson-Laird, 2003). In addition, in lexical tasks which use the left hemisphere’s capacity for language, research has suggested that the right hemisphere may be responsible for insight and ‘Aha!’ moments of understanding (Bowden & Jung-Beeman, 2003). It has thus been suggested that the left hemisphere provides precision by being better at manipulation of concepts and following explicit rules, whereas intuition or insight are the domain of the right hemisphere (Dehaene, 2011; Funnell, Corballis, & Gazzaniga, 2003).

**Self-control.** As the right hemisphere provides contextual awareness, it also appears to provide a realistic interpretation of one’s capacity for success based on existing conditions (McGilchrist, 2009). In particular, McGilchrist (2009) suggests that the right hemisphere may be more pessimistic, but also more realistic. Greater right rather than left hemispheric activation has been associated with lower self-esteem (Lazure & Persinger, 1992; Persinger & Makarec, 1991) and negative affect (Ahern et al., 1993). Damage to the right hemisphere has been implicated in long-term disruptions in the ability to react to emergencies or anticipate consequences, impacting on vocational, social, and marital aspects of life (Schutz, 2005). It has also been observed that right, but not left ventromedial prefrontal cortex damage was associated with deficits in social and emotional function, and decision-making (Tranel, Bechara, & Denburg, 2002). The right prefrontal cortex has also been found to be important in maintaining one’s sense of fairness (Knoch, Pascual-Leone, Meyer, Treyer, & Fehr, 2006), and maintaining self-control and inhibiting selfishness (Knoch & Fehr, 2007).
Benefits of lateralisation.

McGilchrist (2009) suggests that the lateralisation of the hemispheres provides a number of advantages. The left hemisphere, by being adept at narrowly-focussed attention, is particularly capable of simplifying the complex world. There are times where, for example, information on every type of a thing can be overwhelming, and a generalisation may be more useful. The left hemisphere is thus skilled at developing abstractions. These could be ideas, tools or methods which are not a natural part of the world or of existence, but help us to manipulate the world around us for our own benefit. The right hemisphere on the other hand, is better at identifying context, implicit meanings, metaphors and body language. It is thus adept at understanding existence within the embodied world of human experience, which exists within the concrete, corporeal world (McGilchrist, 2009).

The benefit of the left hemisphere’s capacity to develop abstractions is that to understand things in detail, it may be important to examine it in isolation. For example, a scientific study may involve isolating and assessing a particular behaviour. It is important however to holistically consider the results within the context of the study (e.g., a contrived experimental setting using an undergraduate sample that may not reflect everyday experiences of the wider population) and to reconstitute those findings back into existing knowledge and the broader context of life. McGilchrist (2009) suggests that the mechanistic left hemisphere, using denotative language and abstraction provides clarity by narrowly focussing on aspects of life. This clarity however, comes at the cost of being fixed, static, and isolated from broader contexts, and thus relying on generalisations. Thus, a purely mechanistic outlook can be overly reductive. The left hemisphere is suggested to be adept at viewing the world as comprising of distinct, static, parts and entities, which are grouped into distinct classes, and detached from context and the relationships which connect all things. The right hemisphere on the other hand views all things as constantly changing and in a
natural state of flux, deeply interconnected with other entities and interdependent with broader contexts. That is, the holistic right hemisphere provides a complex, contextual, broad, ‘big picture’ view.

McGilchrist (2009) therefore suggests that the two hemispheres provide different interpretations of the world which are useful in different contexts. McGilchrist suggests that mechanistic thinking has been enormously beneficial to the development of human civilisation, but like Ornstein (1997) and Gare (1996), suggests that problems emerge when holistic, contextual issues are not considered, and purely mechanistic viewpoints provide the means to understand the world. McGilchrist (2009) and Gare (1996) suggest that the increasing primacy of mechanistic thinking in contemporary Western civilisation has resulted in it becoming the dominant metaphysics. Gare specifically refers to this metaphysics as mechanistic materialism.
Chapter 12: Mechanistic materialism

Mechanistic materialism assumes that all aspects of the universe comprise separate, distinct parts which lack inherent, interconnected relationships with other things, and fit together as do parts in a machine (i.e., philosophical mechanism). Mechanistic materialism thus emphasises an individualistic, competitive social order. Additionally, in accordance with the left hemisphere’s focus on observable parts (McGilchrist, 2009) there is the assumption that all reality comprises energy or matter which can be measurably observed (i.e., philosophical materialism; Gare, 1996). For these reasons, Gare (1996) argues that mechanistic materialism is inherently nihilistic as nothing is seen to have inherent worth or value. Things are worthy only to the extent to which they can generate observable, tangible, quantitative, external outcomes such as wealth. This results in a focus on manipulating and controlling the world and other people for the purpose of attaining external goals as sources of meaning (Gare, 1996). Gare (1996) and McGilchrist (2009) therefore suggest that the predominance of mechanistic ways of thinking lead to a focus on external, quantifiable outcomes (e.g., wealth, material possessions) as markers of personal and societal success. This is consistent with research and theory suggesting that extrinsic goals such as financial and material gain have become dominant pursuits in life (e.g., Belk, 1984; DeBord, 1995; Fromm, 1976/2005; Kasser, 2002; Kasser & Ryan, 1993, 1996; Richins & Dawson, 1992), as part of a consumer culture (Dittmar, 2007).

The emergence of mechanistic materialism

Gare (1996) suggests that mechanistic thinking, in combination with the influence of Neoplatonism and Christianity has resulted in mechanistic materialism. McGilchrist (2009) suggests that through different periods of Western civilisation, such as the 6th century B.C in the Augustan era and the 15th and 16th centuries in Europe, that there was a balance between
mechanistic and holistic perspectives. At every subsequent stage of Western civilisation however, this balance has shifted further towards mechanistic perspectives. McGilchrist suggests that this shift has occurred for a range of reasons, including the influence of literacy.

**Explaining the predominance of mechanistic thinking in Western civilisation**

**Literacy.** The influence was literacy was previously discussed as having furthered the capacity for abstract thought and the development of mathematics, which have subsequently enabled the development of the modern capitalist system (see Hobart & Schiffman, 1998 for a review), and as a result, a consumer culture (DeBord, 1995; Dittmar, 2007; Kasser & Ryan, 1993, 1996). In combination with the fallacy of misplaced concreteness (Gare, 1996; Whitehead, 1929, 1938), it was suggested that this explains why extrinsic aspirations are not as satisfying as intrinsic aspirations. Whereas intrinsic aspirations accord with concrete, evolved human needs (Deci & Ryan, 2000; Kasser & Ryan, 1993, 1996), extrinsic aspirations are abstract, socially-created connotations often associated with wealth or material goods which have been reified and mistakenly assumed to be more important than intrinsic aspirations. The capacity for abstract thought is also typical of mechanistic thinking (Gare, 1996; McGilchrist, 2009).

McGilchrist (2009) suggests that the movement towards mechanistic thinking in Ancient Greece occurred with the formation of the Greek alphabet, occurring around the 4th century BC. This period coincides with the period in which Plato lived. Written language first began with pictograms (i.e., pictures that look like the thing they represent) in Sumer around 3300BC (McGilchrist), primarily to keep track of livestock numbers and basic trading (Hobart & Schiffman, 1998). This pictographic script – cuneiform - gradually became more abstract with ideograms (i.e., symbol that represents an idea or thing) and finally, phonograms (i.e., a written character which represents a speech sound). Writing, consisting of
pictograms, ideograms and phonograms emerged in Egypt in approximately 3100BC. In phonographic writing systems, which also include Chinese script (hanzi) and Japanese kanji, symbols represent syllables or entire words (syllabic language). Additionally, in languages such as Chinese, the meaning or pronunciation of these symbols can change depending on the order it is used with other symbols. Furthermore, the different pronunciation of syllables can change their meaning (McGilchrist, 2009). Thus, meaning within a syllabic language is based on context. A language, such as that using the Greek alphabet (which emerged with the Phoenician alphabet in approximately the 8th century BC (Johnston, 2003), or the English language, is instead phonemic. Phonemic languages rely on abstract characters (i.e., individual letters), which when placed in certain orders represent the sound of speech. The vowels (e.g., a, e, i, o, u), are the sounds that can be made with the throat without the tongue, lips or teeth to make sounds. When these parts of the mouth are used, consonants are formed. Phonemic languages can therefore provide a more direct way of approximating speech than syllabic languages (Hobart & Schiffman, 1998).

McGilchrist (2009) proposes that syllabic languages are favoured by the right hemisphere due to their contextual nature. In addition, the research of Miller et al. (2000), suggests that the right hemisphere plays a larger role in processing vertical lines, whereas the left hemisphere primarily processes horizontal lines. If the lines are vertical, the left hemisphere examines them from the bottom up, whereas the right hemisphere examines them from the top down. In accordance with right-hemispheric processing, Asian languages such as Chinese and Japanese are written vertically with each line read from top to bottom, with each vertical line written from right to left across the page. It has been observed that pictographic languages (i.e., Japanese) tend to be written in vertical formats whereas phonemic languages (i.e., English) tend to be written horizontally (de Kerckhove & Lumsden, 1988).
While both phonemic and syllabic languages are read from the top down suggesting right hemispheric primacy (i.e., due to the right hemisphere’s role in processing vertical lines; Miller et al., 2000), by 1100BC horizontal writing had replaced vertical writing in Ancient Greece. At this stage however, Greek was written from right to left (McGilchrist, 1999). Between the 8th and 6th centuries BC however, Greek began to be written as boustrophedon (i.e., ‘as the ox ploughs’); at the end of the line the writer would change direction, alternating with each line. By the 5th century BC, left to right writing was becoming the norm, and was the dominant norm by the fourth century BC (Naveh, 1988). As McGilchrist (2009) suggests, reading from left to right is driven by the left hemisphere, with text entering the right visual field which is directed to the left hemisphere. Despite this, research has indicated that languages such as Hebrew and Arabic which are read from right to left also appear to be processed in the left hemisphere (Babkoff & Ben-Uriah, 1983; Eviatar, 1997; Faust, Kravetz, & Babkoff, 1993; Lavidor, Ellis, & Pansky, 2002), as is Chinese (Chee, Tan, & Thiel, 1999; Chee et al., 2000; Tan et al., 2000; Tan et al., 2001; Kuo, et al., 2001). Additionally, while research suggests that the left hemisphere is better at processing phonograms rather than pictograms (Nakamura et al., 2005), both kanji (pictographs) and katakana (phonographs) which comprise the Japanese written language, are principally processed in the left hemisphere (Tokunaga et al., 1999; Thuy et al., 2004).

While this appears to provide evidence contrary to McGilchrist’s (2009) argument that the development of Western civilisation has involved an increasing shift towards mechanistic, left-hemispheric thinking, McGilchrist suggests that the observed changes in literacy, such as the development of left to right writing, indicates a shift towards greater levels of left-hemispheric processing. Thus, while Havelock (1963) suggests that Greek literacy influenced Greek thought, McGilchrist (2009) proposes that the shift towards mechanistic processing may have influenced the development of Greek literacy, reinforcing
left-hemispheric processing. In addition, the development of Greek literacy can be traced back to Sumer, where literacy was developed primarily for numeracy and economics (Hobart & Schiffman, 1998). In contrast, Chinese literacy was not developed for economic means (Hagége, 1988). Therefore, whilst mechanistic and holistic thinking may be characteristics of left and right hemispheric functioning respectively, it may be that phonemic literacy has accentuated mechanistic thinking. While literacy and mechanistic thinking emerged symbiotically, thinkers such as Plato have also enabled the influence of mechanistic thinking on the formation of contemporary Western civilisation (Gare, 1996).

**Plato and mechanistic thinking**

The views of Plato were influenced by Parmenides. Born in approximately 540BC and flourishing around 500BC, Parmenides proposed two assumptions about the nature of reality. First, that reality is based on one’s sensory perceptions of how the world appears to be, leading to inaccurate conclusions about the actual nature of reality (see Gare, 1996). Second, as Parmenides (n. d) described in the Aletheia, the world is ‘One Being’; a static, unchanging, timeless, indestructible whole. The conceptualisation of the world as static and unchanging accords with mechanistic thinking (McGilchrist, 2009).

In contrast to Parmenides, Heraclitus, who flourished at a similar time (approximately the 6th century BC), provided a more holistic viewpoint. Rather than considering reality to be static and unchanging, Heraclitus suggested that change is the natural state of reality. In one of Plato’s dialogues, Cratylus, it is suggested that Heraclitus suggested that all things are in constant change and motion (i.e., ‘You cannot go into the same water twice’; Plato, 2008). Thus, while we might subjectively perceive it to be the same river, it is constantly changing due to the flow of water. Similarly, rather than the view of humans existing in a state of static Being, Heraclitus believed that humans were in a constant process of change and
development; Becoming. Parmenides however, was the primary influence on the thinking of Plato. For example, in another of Plato’s dialogues, the Theaetetus (Plato, n.d. (a)), Parmenides (also referred to as ‘our Father Parmenides’ in the Sophist; Plato, n.d. (b)) is explained to stand alone among wise figures such as Heraclitus, Protagoras, Empedocles and Epicharmus, in stating that the natural stage of reality is static rather than being in constant change and motion.

The belief that reality comprises an unchanging, static whole influenced the thinking of Plato, as evidenced by the Theory of Forms (see Plato 2005, 2008, 2011, n.d. (a), n.d. (b); see also Gare, 1996). Similar to Parmenides, Plato suggested that all observable things are copies of a perfect version of the observed entity which must exist in a separate, timeless, unchanging, mental realm. Plato suggested that abstract, perfect, idealised versions of what we can observe are in fact, the highest and most fundamental version of reality. For example, it is impossible to find a perfect circle in nature. As we know what a perfect circle is, it must exist in this abstract realm of Forms, and that all observable circular objects are approximations of the perfect Form. Plato thus considered the mind rather than the senses as the means to perceive reality (Hobart & Schifferman, 1998). That is, the abstract mental realm is more real than observed reality.

Plato’s (2011) notion that reality is defined by abstract Forms rather than lived experience was explicated in the allegory of the cave. The allegory explains that there are a number of men who have been shackled in a cave facing a wall. Behind them is a fire which provides light and in between the fire and the shackled men, a walkway across which other men carry various objects and animals, casting shadows on the cave wall. For the shackled men, their reality is based entirely on the shadows that they are able to see. They spend their time trying to discern what each shadow represents, with those who make the most accurate predictions deemed the most capable and intelligent. If the men are unshackled and able to
exit the cave and see the real world, they would struggle to comprehend and understand the world which deviates from the shadows on the cave wall which constituted their prior reality.

The metaphysics attributed to Plato involves denying the reality of the observable world. Plato suggested that our perception of the world is less real than the abstract ideals about how the world is; those who comprehend the world with their physical senses are blind to the true nature of reality. As suggested by McGilchrist (2009), this represents a mechanistic tendency to analyse and abstract observable aspects of life beyond human experience, which pertains to the fallacy of misplaced concreteness (Gare, 1996; Whitehead, 1929, 1938). That is, without the holistic capacity to contextualise these abstract conceptualisations of life, the fallacy of misplaced concreteness occurs as abstract ideas are reified so that they become more real than concrete aspects of life. Gare (1996) suggests that many of these views were perpetuated throughout the development of Western Christianity which comprised of Hebraic thought, interpreted and understood from the perspective of Neoplatonist thinking. This formed the means through which individuals came to define themselves, their relationships with others, and their connection to the natural world.

**Historical antecedents of mechanistic materialism**

Among the intellectual traditions emerging from the work of Plato, Gare (1996) considers Plotinus, the originator of Neoplatonism, to have been particularly influential. Based on the hierarchical, classificatory approach of Aristotle (1954), Plotinus (1991) suggested that reality consists as a series of defined stages. At the highest level was ‘the One’; an eternal, perfect, transcendental source of all that exists. All things that exist however were said to comprise succeeding stages of lesser perfection. The next stage involved the Nous, or Intellect. Intellect was considered to involve thoughts or understandings related to static Forms. Emerging from this was the idea of Soul (belonging to both the natural world
and to people), which connects all things and provides the capacity to perceive and interpret representations of Forms in the world. The lowest level was that of Matter, which comprises the imperfect, dynamic, physical world. Plotinus’ theory of reality influenced prominent proponents of Western Christianity such as St Augustine (Gare, 1996). According to Gare (1996), Hebraic versions of Christianity were interpreted with God as equivalent to the One, with humans at the lowest level living in the imperfect, physical world.

Thus, consistent with mechanistic thinking, the Neoplatonist Christian worldview was hierarchical in nature with power and influence flowing downwards from God and high ranking members of the religious order to subordinate members of society. The Christian Neoplatonist view was also one of seeing things in isolation. These views collectively influenced and constituted the types of relationships between social structures, rules and the general population. In particular, individualism emerged in addition to a domineering view towards subordinate groups and to nature, and a focus on utilitarian values (Gare, 1996). For example, temperance was one of the most important Christian virtues during the fifteenth century, involving a duty to know and rule oneself; to be self-disciplined (i.e., to be autonomously regulated; see Deci & Ryan, 1985, 2000). In accordance with the mechanistic focus on observable outcomes (Gare, 1996; McGilchrist, 2009), by 1359, the virtue of temperance had changed to be associated with work and using one’s time effectively (Gare, 1996). This change in the meaning of Temperance occurred during a time in which personal pronouns (i.e., individualism as a result of an increasingly fragmented, atomistic way of thinking) became more commonly used throughout medieval Europe (Gare, 1996).

Additionally, beginning in approximately 1140, law was formally coordinated and integrated as part of a broader system as a result of a treatise by the Bolognese monk, Gratian. Law was viewed as an organic process, developing and growing over time, ultimately culminating in absolute, eternal values representative of divine wisdom. This was
further developed within the Church as canon law, but formed the basis for royal, manorial, feudal, urban and mercantile laws (Berman, 1983). It also provided the societal conditions which enabled the development and propagation of a monetary economy (Berman, 1983; Gare, 1996). In the 8th century, the Carolingians enacted laws and punished through fines or floggings those that did not accept tender in the form of government pennies. In accordance with findings that people may naturally be situational thinkers rather than using abstract, formal operational logic (Jacobs & Klaczynski, 2002; Keating, 1979; Luria, 1976), the fact that punishment was required suggests that people were not receptive to the exchange of an abstract entity (i.e., money) rather than concrete goods and services. Despite this, money was widely established throughout Europe by 1100 (Murray, 1978). Bloch (2013) suggests that prior to the 12th century, land was very rarely bought or sold. Communal households were responsible for any payments or dues owing to individuals within the household, suggesting a strong focus on group cohesion rather than individual accountability. By the fifteenth century, monetary commerce rather than kinship were the defining forces in one’s life.

Neoplatonist Christianity, which emphasised individualism and utilitarianism, provided the conditions required to develop a monetary economy (Gare, 1996). The ubiquity and pervasiveness of the monetary economy reinforced the abstract, universal, temporally transcendent structure for defining human relationships and action, and the view that nature should be dominated to serve human interests. In combination with the increasing importance of a monetary economy, the Forms of virtue such as justice, valour, courtesy and prudence were degraded and replaced with quantifiable outcomes such as money (Gare, 1996). Thus, in accordance with the fallacy of misplaced concreteness (Gare, 1996; Whitehead, 1929, 1938), money had become a reified entity more important than concrete aspects of the world. As suggested by Gare (1996) and McGilchrist (2009), this type of mechanistic thinking which
emphasises individualism, hierarchies, and external outcomes, became typical of Western European civilisation.

The history of European colonialism (e.g., the English in Australia, Spanish in South America) has involved defined hierarchies which enable the subjugation and ability to take advantage of local peoples, their natural environment and natural resources. Thus, other countries and their peoples are treated mechanistically as things or objects to be exploited for financial or political gain (Gare, 1996). Conversely, in China in 1436 a decree was issued forbidding the construction of new seafaring ships as a preventative measure against the temptation to invade other countries (Gare, 1996). At a similar time (1493), Pope Alexander VI divided the non-European world between the Portuguese and Spanish (the treaty of Tordesillas). In contrast to mechanistic views of reality such as those of Parmenides or Plato which became commonplace in the Western world, Gare (1996) and McGilchrist (2009) suggest that Ancient China had a tendency to be more holistic. For example, Confucius’ philosophy emphasised integrity, righteousness, conscientiousness towards other, altruism, and a focus on the shared bonds of humanity. Similarly, Taoism involves the holistic conceptualisation of nature and life as dynamic and changing, consisting of numerous fields of force contained within the primary field of force that is the Tao (Gare, 1996). While this idea is similar to that of the One as proposed by Plotinus (1991), the Chinese tended to emphasise interdependence rather than hierarchical individualism (see Nisbett, 2003) as emerged through the development of Christianity (Gare, 1996).
Chapter 13: Metaphysical differences between cultures

Therefore, there may be fundamental differences in the metaphysical orientations of Ancient Greeks and Chinese, which may have influenced the way that modern people view the world. McGilchrist (2009) suggests that all people use both hemispheres of the brain, but cultural factors can influence the dominance of mechanistic or holistic thinking. Johnson et al. (2011) also suggests that worldview (i.e., metaphysics) may conceptually overlap with culture, which comprises socially created and transmitted practices, ideas, schemas, values, norms, goals, institutions, and ways of orienting to one’s environment (Fiske, Kitayama, Markus, & Nisbett, 1998) which individuals use to make sense of the world. This accords with the assumption underlying this thesis, that human beings are the products of interactions between biological, sociocultural and historical contexts (Gare, 1996; Hegel, 1830/1991, 1830/1970, 1830/1971, 1821/2001; Herder, 1765-1797/2004; Maslow, 1968, Ryan, 1995).

It has been found that individuals who have undertaken economics education are more likely to utilise cost-benefit reasoning than those who have not studied economics (Larrick, Morgan, & Nisbett, 1990; Larrick, Nisbett, & Morgan, 1993). Students who were introduced to cost-benefit theory were found to utilise it outside of the experimental setting (Larrick et al., 1990). This suggests that a small amount of social influence can alter the ways in which people think and reason. It has also been found that training in other abstract rule systems can affect every day reasoning and behaviour (see Nisbett, Fong, Lehman, & Cheng, 1987 for a review). Furthermore, consistent with the notion that intelligence is associated with adopting the normative rules and ways of thinking which will lead to success within one’s environment (e.g., Baron, 1985; Sternberg, 1985), Larrick et al. (1993) found that intelligence and average grades in college students and salary in university faculty members were associated with a greater likelihood to utilise cost-benefit reasoning in everyday decisions. This does not presuppose that cost-benefit reasoning is inherently superior, but that as Gare (1996) and
McGilchrist (2009) argue, that this way of thinking is more likely to be encouraged and rewarded within a Western, capitalist society based on mechanistic norms.

**Holistic and Analytic thinking**

Nisbett and colleagues (see Nisbett, 2003 for a review) in studying differences between East Asians (typically Japanese, South Koreans and Chinese) and Westerners (typically Americans), have identified holistic and analytic thinking styles. Holistic thought is conceptualised as focusing on the whole context or field; explaining and predicting phenomena on the basis of the relationships they share with other aspects of the world; viewing the world as a constant, dynamic process in which change is the natural state of existence; the recognition and acceptance of contradiction, as knowledge and interpretation can be contextual and subjective; and a focus on experiential knowledge rather than abstract logic. In comparison, analytic thinking is defined as viewing objects in isolation of context; categorising objects based on categories; using rules about categories to predict behaviour; avoiding contradiction on the basis of finding absolute truth; and emphasising formal logic rather than first-hand experience (Nisbett, 2003; see also Nisbett, Peng, Choi, & Norenzayan, 2001; Masuda & Nisbett, 2001; Peng & Nisbett, 1999). These conceptualisations of holistic and analytic thinking correspond closely to holistic and mechanistic thinking as defined by McGilchrist (2009). McGilchrist suggests that holistic thinking is differentiated from mechanistic thinking on the basis of viewing all aspects of life as being inherently embedded in broader contexts; that the world is not static and change is the natural state of existence; and that there is no universal, absolute truth or understanding. These principles are akin to those described by Peng and Nisbett (1999) as comprising the basis of Chinese dialectical thought; change, contradiction, and relationships.
The principle of change involves the notion that reality is a process that is in a constant state of flux; existence is not static but dynamic and always changing. As a result, concepts that are understood as reflecting reality are also seen as being active, changeable and subjective rather than static, objective and fixed. The second principle of contradiction is based on this sense of subjectivity. Good and bad for example, are a matter of perspective. The third principle of relationships suggests that all things in life are connected. Nothing is isolated and independent of all else (Peng & Nisbett, 1999). Thus, Chinese dialecticism is considered to be holistic by Nisbett (2003), and is similar to holism as defined by Gare (1996) and McGilchrist (2009). Furthermore, Gare (1996), McGilchrist (2009), and Nisbett et al. (2001, see also Nisbett, 2003) contend that major observable differences in contemporary analytic and holistic thinking styles can be traced back to ancient Greece and China respectively. In discussing the differences between ancient Greek and Chinese thought, Nisbett et al. (2001) identified five primary areas.

The first considers continuity and discreteness. Whereas the Greeks viewed all things as having discrete, universal properties through which they could be categorised (e.g., ‘whiteness’ or ‘hardness’; for example, the philosophy of Aristotle (1954); see also Gare, 1996), the Chinese viewed matter as being continuous and overlapping (Needham, 1962). The second area was the difference between focussing on characteristics of objects or broader fields. As a result of the Greeks’ way of considering objects as having universal properties, a rock was considered to fall as a result of having the property of gravity. In comparison, the Chinese view was that a rock would fall as due to being acted on by the force of gravity. This knowledge of forces may have been why the Chinese had superior knowledge on things such as magnetism, acoustic resonance, and tidal behaviour in comparison to the Greeks (Needham, 1962). The third difference was based on the consideration of contextual factors. The Chinese attempted to understand things based on context and their relationships with
other objects and events. The Greeks on the other hand tended to use rules and categories rather than contextual factors to understand things (Gare, 1996). Hadingham (1994) proposes that this is evident in the medical traditions of both cultures. Whereas the Greeks often utilised surgery to remove malfunctioning parts of the body, the Chinese believed that good health was the result of maintaining the balance of natural forces within the body (see also Kaptchuk, 2000). The fourth difference involved the extent to which truth was seen as being absolute or relative. The Chinese considered that both sides of an argument could be correct; a dialectical approach of reconciling or accepting contradiction to find the ‘middle way’.

Conversely, the Greek focus on formal logic presupposed definitive, absolute answers. The final difference involved the ancient Chinese tendency to understand the world through first-hand experience. Consistent with Plato’s allegory of the cave, the Greeks viewed first-hand experience as unreliable and that formal logic was the only means through which to reach true understanding and knowledge (Nisbett et al., 2001).

Similar to both Gare (1996) and McGilchrist (2009), Nisbett et al. (2001) suggest that these fundamental differences between ancient Greek and Chinese ways of thinking have endured to the present day. In particular, the extent to which social environments rather than individual dispositions are considered; how much one believes personal agency and control compared to contextual factors can influence situations; the extent to which the behaviour of other people is explained on the basis of contextual social factors or enduring personality characteristics (e.g., the fundamental attribution error; Ross, 1977); the consideration of contextual social factors in predicting and understanding causation; whether the world is understood on the basis of shared relationships between objects or the use of rule-based categories; the use of prior experience or formal logical rules in understanding objects or phenomena; and whether a dialectical approach emphasising the acceptance or avoidance of contradiction is used. Research has supported each of these differences.
Personal agency and control

Similar to McGilchrist’s (2009) assertion that the mechanistic left hemisphere of the brain seeks to control the environment whereas the holistic right hemisphere tends to consider things in accordance with environmental contexts, Hsu (1981) suggested that holistic Chinese people seek to conform to reality whereas analytic (i.e., mechanistic) Americans attempt to make reality conform to personal needs. Findings from Nisbett et al. (2001) and Ji, Peng, and Nisbett (2000) suggested that Americans may be more likely to believe they have an illusion of control – a belief that they have more control or capacity for personal success than is objectively possible in a given situation (Langer, 1975) – than East Asians. Research has found that European Americans appear to have a greater sense of perceived control of external events than Hispanic Americans and East Asians, who both appeared to be more capable of accommodating to existing reality (Sastry & Ross, 1998; Weisz, Rothbaum, & Blackburn, 1984). American males have also been found to be more optimistic in which they had an illusion of personal control, whereas Japanese participants and American females were more optimistic in conditions emphasising collective rather than individual control (Yamaguchi, Gelfand, Ohashi, & Zemba, 2005). Perceived control has been found to be of benefit to mental health in Americans (Taylor & Brown, 1988) but not necessarily in East Asians (Sastry & Ross, 1998).

Attention to parts or the whole

Research examining differences in attention has also found that Chinese Americans were likely to base Rorschach card responses on ‘whole-card’ or Gestalt responses whereas European Americans were more likely to focus on single aspects of the image in providing an answer (Abel & Hsu, 1949). Masuda and Nisbett (2001) provided participants with animated underwater scenes featuring fish and other objects. American participants tended to focus on
individual fish at first, whereas Japanese participants were more likely to first notice background elements. Participants from both cultural backgrounds were equally likely to report behavioural details about the focal fish in the video, but Japanese participants were more likely to relate explanations to aspects of the environment. Masuda and Nisbett also found that changing the background environment affected the ability of Japanese participants to recognise the focal fish, but this was not the case with the American participants. Similar research has suggested that the background of a stimulus may act as a retrieval cue for Chinese but not American participants (Park, Nisbett, & Hedden, 1999).

Park et al. (1999) provided participants with cards on which a printed word appeared on a background of a social scene (e.g., people at a market) or with no background. Despite the words being unrelated to the depicted social scene, Chinese participants recalled words significantly better than Americans if the word was presented with the social scene background. Ji et al. (2000) have suggested that the perception of East Asians is more field-dependent than Americans. Participants were asked to complete the rod and frame test in which participants are asked to look at a rod framed by a rectangular box. The researcher is able to manipulate the angle of the rod, the box and the participant’s chair. The aim for participants is to manipulate the rod so that it stands perfectly upright. In order to do so, the participant must ignore surrounding visual cues. If successful, the participant is considered to be field-independent whereas if the rod is leaning in the same direction as the angle of the box, the participant is considered to be field-dependent. Chinese participants tended to be more field-dependent and less confident in the accuracy of their performance than American participants. Chinese participants were also more likely than American participants to make predictions on the basis of covariation (Ji et al.). That is, predictions were made on the belief that elements were causally linked (i.e., emphasising interdependence) rather than being independent.
Considering context or dispositions in explaining events

In accordance with differences arising from the Chinese tendency to focus on contextual factors and the Greek tendency to focus on characteristics of discrete objects (Nisbett et al., 2001; Masuda & Nisbett, 2003; Peng & Nisbett, 1999), Choi, Nisbett, and Norenzayan (1999) found that causality tends to be attributed to aspects of the environment by East Asians and to characteristics of objects by American respondents. These findings pertain to the fundamental attribution error (Ross, 1977) which occurs when behaviour is assumed to result from a person’s enduring personality characteristics rather than environmental or situational contexts. Miller (1984) found that American children were twice as likely as Hindu Indian children to mention dispositions (e.g., recklessness or kindness) in explaining good or bad behaviour in an acquaintance. In comparison, the Indian children were twice as likely to mention social roles, obligations and other contextual factors. Miller also found that these attribution styles increased with age, with the disparity being greater between American and Hindu Indian adults than between children from these cultural backgrounds.

Similar finding were obtained by two studies (Morris & Peng, 1994; Morris, Nisbett, & Peng, 1995) which analysed accounts of two murders in America. One of these murders involved a disgruntled Chinese graduate student who killed his supervisor due to a perceived lack of adequate support. American newspapers were more likely to focus on dispositional aspects of the shooter (e.g., mental instability, problems controlling anger), whereas Chinese newspapers emphasized contextual, situational and societal factors (e.g., conflict between the shooter and the victim, a reflection on Chinese culture, and as a copycat crime based on an earlier shooting). American and Chinese newspapers also reported a similar murder in which a disgruntled American postal worker killed his supervisor. These newspapers again showed a similar disparity in the focus on dispositional or contextual factors as motives. When asked
to provide possible reasons to explain the shootings, Chinese university students tended to focus on contextual explanations, whereas American students often provided explanations based on the dispositional of the shooter. Using a scale to measure holistic thinking, Choi, Dalal, Kim-Prieto, and Park (2003) found that Koreans were more holistic than Americans, and that holism was associated with considering a wider range of contextual information in explaining deviant behaviour (i.e., a student murdering his supervisor). As a result, Koreans also tended to consider external, contextual reasons for the murder, in comparison to Americans who tended to consider dispositional reasons.

In relation to academic success, East Asians are more likely to attribute academic success to external, contextual factors (e.g., quality of teaching) than Americans (Chandler, Sharma, Wolf, & Planchard, 1981; Yan & Gaier, 1994). Journalists in Hong Kong have also been found to focus more on contextual rather than dispositional factors in explaining the success of sporting teams and the outcomes of sporting events in comparison to American journalists (Hallahan, Lee, & Herzog, 1997; Lee, Hallahan, & Herzog, 1996).

In comparison to Americans, Koreans have also been found to consider contextual, situational information when making causal attributions (Cha & Nam, 1985) or when asked to predict how people might behave in certain situations (see Choi et al., 1999 for a review). In the case that East Asians use dispositional explanations, they tend to consider dispositions of groups rather than particular individuals (Menon, Morris, Chiu, & Hong, 1999). In the studies utilising an animated video of fish, Japanese (Masuda & Nisbett, 2001) and Chinese (Morris & Peng, 1994) participants were more likely to view the behaviour of the fish as being influenced by external factors in comparison to American participants who were more likely to view behaviour as being produced by internal factors.
A further study (Choi & Nisbett, 1998) asked students to write an essay on a contentious social issue (i.e., capital punishment). Jones and Harris (1967) had previously found that participants were likely to assume that someone writing positively of a contentious social issue for the time (i.e., Castro’s Cuba) was actually in support of this issue, even under conditions in which the participant was aware that the author had no choice in choosing a side in the argument. Choi and Nisbett (1998) replicated this research but added a condition in which in addition to reading an essay, some participants had to write an essay with no choice on which side to take. Korean participants who wrote an essay and were given no choice in which side to take made less inferences about the original author when reading an essay than Korean students who did not have to write an essay. American participants, who had to write an essay with no choice on the argument they had to take, continued to make inferences about the original author to the same extent as American participants who did not have to write an essay. Thus, even when made aware that the behaviour of others is influenced by external factors beyond one’s control, Americans were more likely than Koreans to believe that the behaviour of others was still influenced by dispositional factors. There are negatives however, in basing judgement or understanding on contextual rather than dispositional factors.

Choi and Nisbett (2000) found that Asians tend to have a hindsight bias, a tendency to believe that one knew all along what an outcome might be, even if there was no knowing what the outcome might actually have been (Fischoff, 1975). Using vignettes in which participants could not possibly anticipate certain outcomes, Choi and Nisbett (2000) found that Koreans were less surprised by unexpected outcomes and reported a greater hindsight bias than Americans. Even when provided with conflicting or contradictory scientific theories, Koreans were less likely than Americans to be surprised or to feel that outcomes were unexpected. Thus, as Westerners may develop understanding based on formal rules and
logic rather than experience, they may be more surprised by unexpected outcomes which lead to a revision of one’s logical rules. For East Asians, as everything may be perceived as being inherently connected, even unexpected outcomes are considered to accord with one’s existing views.

**Relationships versus categories**

It is also expected that Westerners are more likely to use dispositional aspects or rule-based categories when grouping objects or creating associations in comparison to East Asians. A majority of this research provides similar findings to Luria (1976) who found that pre-literate individuals tended to focus on practical relationships, whereas literate individuals considered abstract, superordinate categories

Chiu (1972) found that Chinese children were more likely than American children to group items on the basis of their contextual relationships rather than on the basis of rule-based categorisation. For example, when presented with a picture of a man, woman, and child, Chinese children grouped the woman and child together due to the likely caregiver relationship. American children grouped the man and woman together as both are adults.

Norenzayan, Smith, Kim, and Nisbett (2002) found that East Asians have a tendency to group items on the basis of ‘family resemblance’ whereas Americans tend to utilise a rule-based approach focusing on categorical aspects of the object. Further research has suggested that after learning rule-based categorisation techniques, East Asians are slower at categorising items than Americans, and are more likely to make mistakes if an item is presented which shares ‘family resemblance’ but does not meet rule criteria (Norenzayan et al., 2002).

As further evidence of using relationships or resemblance to group objects rather than formal, logical rules, Ji, Zhang, and Nisbett (2004) provided participants with three words (e.g., monkey, panda, and banana) and asked them to indicate which two words were most
similar, and why. Americans emphasised categories (e.g., the monkey and panda are both animals) whereas East Asian (Chinese students from mainland China, Taiwan, Singapore, and Hong Kong) participants emphasised relationships (e.g., the monkey eats bananas). It was also found that the responses of Chinese from mainland China and Taiwan were more relational when they completed the task in Chinese than in English. Chinese from Hong Kong and Singapore were equally relational regardless of language. Ji et al. (2004) propose that this may be the result of Westernization. Participants from Hong Kong and Singapore for example, may have learnt English at an earlier age and been exposed to Western ideas and values for a longer time resulting in a greater integration of holistic and analytic viewpoints. For mainland Chinese, speaking in Chinese or English may result in defined differences in thinking. This point is similar to the argument made by McGilchrist (2009) that Chinese script, in which the meaning and pronunciation of words depends on contextual factors (e.g., the order of particular symbols), may reflect right-hemispheric processing and holistic thinking, whereas alphabetic languages like English emphasise left-hemispheric, mechanistic processing.

First-hand experience or formal logic

Another major difference between mechanistic ancient Greek and holistic ancient Chinese ways of thinking was the extent to which formal logic or first-hand experience were considered suitable means to understand the world (Gare, 1996; McGilchrist, 2009; Nisbett et al., 2001). Deglin and Kinsbourne (1996) used electroconvulsive therapy to inactivate one hemisphere of the brain at a time. When presented with a logical syllogism with a false conclusion, individuals would agree with the formal logic of the syllogism when responding with their left hemisphere (i.e., mechanistic response), but would rely on prior knowledge when responding with the right hemisphere (i.e., holistic response; McGilchrist, 2009).
To assess cultural differences, Norenzayan, Smith, et al. (2002) presented logical syllogisms, each with the same premise; ‘All birds have ulnar arteries’. In the exemplar argument condition, the conclusion was ‘Therefore, all eagles have ulnar arteries’. In the atypical condition; ‘Therefore, all penguins have ulnar arteries’. Korean participants were more likely to be convinced in the exemplar condition (i.e., what accords with prior knowledge or experience) whereas American participants were equally convinced by both typical and atypical arguments as both syllogisms were equally logical. Norenzayan et al. also found that when presented with valid or invalid syllogisms with plausible or implausible conclusions, Korean students were more likely than Americans to judge valid arguments as being invalid if they had implausible conclusions. American participants were more likely than Koreans to make decisions on the basis of logical rules rather than experiential knowledge. These findings accord with McGilchrist (2009) and Nisbett (2003) who have suggested that all people are capable of holistic and analytic/mechanistic thinking, but that culture may influence dominant ways of thinking.

**Seeking the ‘middle way’ or absolute truth**

The extent to which individuals accept contradictory information or desire absolute answers is key to Chinese dialectical thinking (Peng & Nisbett, 1999) and was also one of the major differences between the ancient Chinese and Greeks (Nisbett et al., 2001). Peng and Nisbett (1999) indicated that this difference is still common in contemporary society. Chinese and American students for example, were asked to consider an argument between mothers and daughters. American students tended to favour either the mother or the daughter (e.g., “Mothers should respect daughters’ independence”), whereas Chinese students focussed on the ‘middle way’ (e.g., “The mothers and daughters have failed to understand each other”). Chinese respondents were thus more likely to believe that truth may be subjective rather than definitive.
Peng and Nisbett (1999) found further evidence for the East Asian tendency to find the ‘middle way’ by providing participants with contradictory social science studies. American students tended to support the more plausible of the two contradictory studies, whereas Chinese participants suggested that both may be equally plausible. In another study, both Korean and American students were provided with strong arguments in support of funding a project and subsequently provided with weak arguments opposed to funding the project. American participants became stronger in their conviction that the program should be funded, whereas Koreans became more opposed to funding the project. This suggests that when a second perspective becomes available, even if it is less compelling, East Asians may still seek to find a point of harmony between the two perspectives (Peng & Nisbett, 1999). A similar finding was obtained by Briley, Morris and Simonson (2000) who provided American and East Asian participants with three hypothetical products. An aspect of A was superior to B and C, whereas a different aspect of C was superior to A and B, with B provided as a moderate option in between A and C. Participants of both cultural backgrounds tended to pick B but for different reasons. American participants tended to focus on one aspect that made B the better option (e.g., “RAM is more important than hard drive space”), whereas Asian participants considered multiple aspects (e.g., “both RAM and hard drive space are important”). Holistic and analytic (i.e., mechanistic) differences in decision making are also relevant to cognitive dual-processing models (e.g., Evans, 2008; Kahneman, 2003; Stanovich & West, 2000).

**Dual-processing models**

Buchtel and Norenzayan (2009) suggest that the analytic-holistic (e.g., Nisbett, 2003) dichotomy is similar yet distinct to dual-processing models which emphasise two different styles of thinking. These two styles of thinking have been referred to as Systems 1 and 2 (Kahneman, 2003; Stanovich & West, 2000), associative and analytic (Sloman, 1996), and
intuitive-experiential and analytical-rational thinking (Epstein, Pacini, Denes-Raj, & Heier., 1996). System 1 is considered to be involved in contextualising experience whereas System 2 is involved with decontextualisation (e.g., Epstein, 1991; Evans, 2008; Kahneman, 2003; Sloman, 1996; Stanovich & West, 2000). A range of perspectives according with Systems 1 and 2 have included conceptualisations of automatic versus controlled thinking (Schneider & Schiffrin, 1977); experiential and rational (Epstein, 1991, 1994; Epstein & Pacini, 1999); heuristic and systematic (Chaiken, 1980; Chen & Chaiken, 1999); heuristic and analytic (Evans, 2006); implicit and explicit (Evans & Over, 1996); associative and rule-based (Sloman, 1996; Smith & DeCoster, 1999); intuitive and analytic (Hammond, 1996); adaptive unconscious versus conscious thought (Wilson, 2002); perception of stimuli versus higher order thinking (Toates, 2006); reflexive or reflective (Lieberman, Jarcho, & Satpute, 2004); and impulsive and reflective (Strack & Deutsch, 2004). Overall, these views generally consider System 1 as being based on intuitive, experiential, ‘every day’ types of thinking, whereas System 2 tends to reflect deeper, more effortful thought processes. System 1 is thus similar to Default Processing whereas System 2 is similar to Intellective Processing (Eigenberger et al., 2007). There are four theoretical areas in which Systems 1 and 2 can be delineated; conscious awareness, through evolutionary development, functional processing, and individual differences (Evans, 2008).

As suggested by Evans (2008), in regards to conscious awareness System 1 is automatic, effortless in processing, based on immediate perceptions, implicit, rapid and holistic. System 2 involves effortful, explicit, conscious processing that is reflective and analytic. Evolutionarily, System 1 is older, non-verbal and expressed similarly in both humans and other animals, whereas System 2 is linked with language, unique to humans and has occurred much more recently in our evolution as a species. The functional characteristics suggest that System 1 is associative in nature, considers things in context, and is pragmatic
and situational. System 2 on the other hand relies on formal logical rules with an emphasis on abstract logic and sequential reasoning. Finally, in terms of individual differences, System 1 is considered to be universal and common to all people and acts independently of general intelligence or working memory, whereas System 2 is heritable but also culturally acquired through the development of general intelligence and working memory capacity.

Buchtel and Norenzayan (2009) suggest that many of these differences, such as those pertaining to functional characteristics such as contextual, situational thinking (i.e., System 1) compared to logical, abstract (i.e., System 2) thinking are conceptually similar to holistic and analytic thinking respectively. The authors argue however, that the assertion of System 2 thinking as the superior means to contextualise and understand the world (e.g., Epstein, 1991; Evans, 2006, 2008; Kahneman, 2003; Sloman, 1996; Stanovich & West, 2000), represents a cultural bias. That is, analytic, logical thinking may only comprise Systems 2 thinking in Western cultures. Similarly, Gare (1996) and McGilchrist (2009) have suggested that mechanistic thinking is deemed superior in a society based on mechanistic thinking. Accordingly, Evans (2008) suggests that dual-process research thus far has typically conceptualised holistic thinking as part of the less evolved System 1, whereas analytic thinking is part of the higher-order System 2.

Nisbett et al. (2001; see also Nisbett, 2003), McGilchrist (2009), and Ornstein (1997) have argued that all people are capable of analytic/mechanistic or holistic thinking but that different cultures may emphasise the use of one style of thinking over another. For example, it has been found that holistic or analytic (i.e., mechanistic) thinking can be increased by priming individuals to think of social relationships or as being independent from other people (e.g., Kim & Markman, 2006; Kühnen & Oyserman, 2002). As Buchtel and Norenzayan (2009) suggest, System 1 may be the effortless method of processing perceptual stimuli, whereas System 2 is the higher order means through which the world is understood through
either a holistic or analytic (i.e., mechanistic) lens. System 2 thinking appears to result from formal education and has its basis in cultural values and beliefs (Sloman, 1996; Stanovich & West, 2000). Therefore, holistic thinking observed in East Asian samples, may be the result of a trained, culturally-derived example of System 2 thinking (Buchtel & Norenzayan, 2009).

The link between System 2 as ‘higher order’ thinking that emphasises analytic, logical thinking (Buchtel & Norenzayan, 2009) accords with Gare (1996) and McGilchrist (2009) who have argued that mechanistic thinking has inaccurately become thought of as the most logical, reasonable, ‘superior’ way of thinking. Ornstein (1997), like McGilchrist (2009) suggests that the right hemisphere of the brain provides context, whereas the left hemisphere of the brain is the seat of abstract, analytic, verbal logic. As mentioned earlier, previous neuropsychological research and theory, such as that proposed by Gazzaniga (1985) has considered the right hemisphere to be inferior to the left hemisphere (see also McGilchrist, 2009; Ornstein, 1997 for reviews). Despite this, as McGilchrist (2009) argues, holistic thinking should be the guiding force for mechanistic thinking; an understanding of the big picture should guide the analysis of the constituent parts. Furthermore, the development of Western civilisation has involved an increasing shift towards mechanistic thinking whilst devaluing the importance of holistic points of view (Gare, 1996; McGilchrist, 2009).

Similarly, Buchtel and Norenzayan (2009) suggest that rather than Eastern cultures discouraging the use of analytic thinking, it may be that Western cultures devalue the importance of holistic, experiential, situational thinking, which has been heretofore considered part of the more impulsive, irrational thinking typical of System 1. For example, research has shown that East Asians attend to a greater amount of situational or contextual information in understanding the behaviour of others than do American participants (Choi et al., 1999; Choi et al., 2003; Masuda & Kitayama, 2004; Morris & Peng, 1994; Norenzayan, Choi, & Nisbett, 2002). In addition, whereas theory suggests that System 2 involves abstract
thinking and decontextualisation (e.g., Epstein, 1991; Evans, 2006, 2008; Kahneman, 2003; Sloman, 1996; Stanovich & West, 2000), it appears that the elaborative, higher order thinking used by East Asians in understanding certain situations involves a large emphasis on understanding context (Buchtel & Norenzayan, 2009).

Another dual-processing theory suggests that the two systems comprise reflexive and reflective thinking (Lieberman et al., 2004). The reflexive system involves automatic or implicit functioning, such as that involved with conditioning and associative learning. The reflective system on the other hand is considered to be associated with explicit learning and executive control. Rather than talking of System 1 and 2, Evans (2008) suggests Type 1 (i.e., fast, automatic, unconscious) and Type 2 (slow, effortful, conscious) thinking. Thus, the reflective, Type 2 system could be either mechanistic or holistic (Buchtel & Norenzayan, 2009). The view of reflective thinking being either mechanistic or holistic accords with the theory of Gare (1996) and McGilchrist (2009), and is similar to the conclusion derived from Study 1, which suggested that intellective and default processing, while related to lower levels of consumer materialism for example, may not explain the underlying reason why a focus on extrinsic aspirations and consumer materialism exists in the first place. That is, intellective processing may involve differing levels of mechanistic or holistic thinking.

Conclusion

Based on the review so far, it appears that there is convergent historical and cultural (e.g., Gare, 1996; Nisbett, 2003; McGilchrist, 2009), psychophysiological (McGilchrist, 2009), and cognitive (Buchtel & Norenzayan, 2009; Evans, 2008) evidence for the existence of holistic and mechanistic thinking (see Gare, 1996; McGilchrist, 2009). For example, it appears that in general, Americans are less holistic and more analytic than East Asians (see Nisbett, 2003 for a review). Furthermore, the domains in which these differences manifest
themselves, such as awareness of contextual factors or viewing aspects of the world as being separate or inherently connected as part of broader wholes, appear to be evident in differences between ancient Greeks and Chinese (Gare, 1996; Nisbett, 2003; McGilchrist, 2009), and also correspond with McGilchrist’s (2009) assertion that the left and right hemispheres of the brain provides mechanistic and holistic perspectives respectively. Furthermore, it appears that mechanistic thinking may have shaped the development of contemporary Western civilisation and the development of a consumer culture (see Gare, 1996; McGilchrist, 2009). The following chapter will further explicate the potential influence of holistic and mechanistic thinking on aspirations and materialism.
Chapter 14: Holistic and mechanistic thinking in relation to extrinsic aspirations, materialism, and a consumer culture

As explained earlier, a focus on extrinsic aspirations (Grouzet et al., 2005; Kasser & Ryan, 1993, 1996) such as those associated with consumer materialism comprise normative values and pursuits in a consumer society (Dittmar, 2007; Kasser et al., 2011; see also DeBord, 1995; Fromm, 1976/2005). Gare (1996) and McGilchrist (2009) suggest that a consumer culture may have developed due to the predominance of mechanistic thinking. Mechanistic thinking, by focussing on isolated elements outside of broader contexts, tends to primarily find meaning, value, or purpose through external, quantifiable outcomes. Both authors have both suggested that mechanistic thinking was largely responsible for the industrial revolution, and the development of modern capitalism, as major components of the development of contemporary Western society. As a result of the influence of mechanistic thought on the development of Western civilisation, Gare (1996) and McGilchrist (2009) also argue that capitalism and consumerism – ways of conceiving the world through utility, instrumental value, individualism and competitiveness – have become dominant ways of conceptualising oneself and relationships with others. Furthermore, both authors suggest that the increasing importance of mechanistic thinking permitted the development of the perception of people as rational, self-interested, utility maximisers striving for material gain. This was part of the assumption underlying the emergence of neoclassical economics and liberal political ideology (Heywood, 2007).

The influence of liberal ideological thought and individualism

British empiricist philosophers such as Locke, Hume and Mill were mechanistic thinkers who considered cognition to be similar across all adults (e.g., Gare, 1996; McGilchrist, 2009; Nisbett et al., 2001). That is, they did not consider broader societal or
cultural factors and assumed that there was singular, accurate way of looking at the world. These thinkers were also responsible for developing classical liberalism, the precursor to the liberal ideological perspectives that influence contemporary Western civilisation (Gare, 1996; Heywood, 2007). These ideological perspectives emphasised the importance of individualism and social Darwinism (e.g., those who succeed in life must be the ‘fittest’ and most capable).

Social Darwinism was the basis of classical liberalism, which provided the conditions for the development of Neoliberalism (Heywood, 2007). These perspectives emphasise individualism through the belief that the economy should comprise an unregulated free market in which self-striving is unrestricted. Furthermore, these perspectives tend to downplay the necessity of economic welfare, due to beliefs that individuals are in control of their own lives, and those who do not succeed must be those who are less competent, or do not work as hard as others (Heywood, 2007). These perspectives accord with the analytic/mechanistic tendency to make fundamental attribution errors by assuming that dispositional rather than situational factors influence behaviour in others (Masuda & Nisbett, 2001; Morris & Peng, 1994; Nisbett et al, 2001). These issues also reflect the mechanistic tendency to view all things as made up of separate parts (i.e., society comprises separate individuals), and the tendency to not consider broader context (e.g., someone might not succeed in life due to a range of negative circumstances outside their control; Gare, 1996; McGilchrist, 2009). Thus, classical liberalism and neoliberalism may represent mechanistic conceptualisations of society (Gare 1996; McGilchrist, 2009).

In contrast, modern liberalism and socialism suggest that success or failure in society is not indicative of who is the ‘fittest’ and should prosper, but that a complex range of factors can influence one’s success in life above and beyond work ethic, intelligence or ability (Heywood, 2007). Over time, Modern Liberalism has predominated over Classical Liberalism, whereas Socialism has been largely replaced by Social Democracy. Social
Democracy accepts capitalism and individual ownership as an acceptable means to organise a society and an economy, tempered by a desire to ‘humanise’ capitalism so that there is a greater level of economic equality between all people (Heywood, 2007). Ultimately, Modern Liberal and Social Democratic views may emphasise holistic perspectives due to an awareness of contextual social factors that can play a role in influencing one’s life beyond individual competence or effort. Thus, the dichotomy between left and right-wing political parties may represent differences in holistic and mechanistic thinking respectively.

All people are capable of holistic or mechanistic thinking, and social or cultural factors may lead to one perspective predominating over the other (McGilchrist, 2009; Nisbett, 2003). As mentioned earlier, intelligence and average grades (in college students) and salary (in university faculty members) have been found to be associated with a greater likelihood to utilise cost-benefit reasoning in everyday decisions (Larrick et al., 1993). Cost-benefit rationalisation is likely to be encouraged and rewarded within a Western, capitalist society based on mechanistic norms (Gare, 1996; McGilchrist, 2009). In addition, in Western society, the development and predominance of liberal ideologies which emphasise individualism and self-interest (Heywood, 2007) may have occurred as a result of, and legitimised mechanistic conceptualisations of the self, others, and society in general, as being inherently selfInterested (Miller, 1999; Miller & Ratner, 1996, 1998).

Self-interest

With the greater emphasis on mechanistic thinking, Gare (1996) and McGilchrist (2009) suggest that there has been a growing focus on self-interest as a dominant human motive (see also Schwartz, 1986). In accordance with the notion of self-interest and individualism being culturally ingrained as a result of liberal political ideologies (Gare, 1996; Heywood, 2007), self-interest is also seen to be a shared cultural ideology (e.g., Lerner, 1982;
Miller & Ratner, 1996; Wallach & Wallach, 1983). Accordingly, research has indicated that not all people around the world are inherently self-interested (Henrich, Heine, & Norenzayan, 2010).

Gare (1996) suggests that ideologies emerge out of a dominant metaphysics; the understanding of the inherent ‘natural’ way of existence. These assumptions underlie and emerge through social practices and institutions which then reflect and reinforce those assumptions. McGilchrist (2009) also argues that mechanistic thinking tends to be self-fulfilling, as one’s pre-existing assumptions are not questioned or considered and come to influence what one perceives or comes to understand (see also Nietzsche, 1990). Similarly, Schwartz (1997) suggests that science can create concepts or ways of understanding the world which then influence what people think about, and then how they subsequently choose to act in the world. Gramsci’s (1971) theory of cultural hegemony also suggests that ideas are disseminated by influential figures and institutions, filter through society, and eventually become normative, ‘common sense’ value or ideas. The assumption that self-interest is a natural part of human nature has influenced evolutionary biology, behaviourism, and psychoanalytic theory (Schwartz, 1986; Wallach & Wallach, 1983), in addition to influencing lay understandings of human nature (Miller, 1999).

Miller and Ratner (1996, 1998) have found that individuals believe that the behaviour of others, but not that of the self, is motivated primarily by self-interest (see also Miller, 1999; Ratner & Miller, 2001). Miller (1999) suggests that self-interest can be increased via direct or indirect means. As an example of direct influence, Frank, Gilovich and Regan (1993) examined self-interest in relation to a moral dilemma. University students were asked at the start of semester whether they would return a lost envelope with $100 in it, and if they would report a billing error that financially benefitted them. Students were in either an astronomy class or one of two microeconomics classes; with one specialising in game theory
(i.e., self-interest is a natural part of human motivation). At the end of the semester it was observed that the microeconomics students were less likely to report the billing error or return the $100 than the astronomy students. In addition, the students who had studied game theory were less likely to act honestly in comparison to students in the other microeconomics class. These findings are similar to those of Larrick and colleagues (Larrick et al., 1990; Larrick et al., 1993) who found that cost-benefit theory was more likely to be used by individuals who had undertaken economics classes, and likely to be utilised in real life.

An example of the indirect means through which self-interest can be increased is via the focus by political parties on individual economic benefits (Miller, 1999). In 1980, the link between self-interest and voting preference was .08 (Sears & Funk, 1991), but increased to .36 by 1984 (Lau, Sears, & Jessor, 1990). This appeared to coincide with the presidency of Ronald Reagan (Miller, 1999) who emphasised Neoliberal (i.e., self-interested) values (Heywood, 2007). In addition, the self-interest bias is perpetuated when individuals act in a self-interested way due to the belief that others are self-interested, which then reinforces the belief of other people as being self-interested. Self-interest is thus self-fulfilling (Berger & Luckmann, 1966; Gergen, 1973, Schwartz, 1997; Wallach & Wallach, 1983). Individuals are likely to act in a certain way if they believe others are going to act in that way (Darley & Fazio, 1980; Miller & Turnbull, 1986; Snyder & Stukas, 1998). It has also been found in experimental games that individuals are more likely to develop self-interested strategies if others are acting in a self-interested manner (Bouas & Komorita, 1996; Kelley & Stahelski, 1970; Messé & Sivacek, 1979). This may be the result of individuals believing that they will be exploited or will lose out if they do not also adopt a self-interested approach (Miller, 1999). This was also observed in research by Ratner and Miller (2001), as people appeared to become more self-interested in the belief that others were self-interested. Another justification for self-interest is that if one does not act in their self-interest, they are likely to
be criticised or judged by others for not upholding a social norm (Ratner & Miller, 2001), and without support from others, unlikely to achieve their goals (Miller & Ratner, 1998).

Based on the rational, utilitarian nature of liberal ideologies and neoclassical economics (Gare, 1996), in accordance with the mechanistic focus on quantifiable outcomes (Gare, 1996; McGilchrist, 2009), the pursuit of self-interest is based not on the pursuit of principles or ideals, but tangible, material motives such as economic profit (Miller, 1999). In contemporary Western society rationality is intertwined with economic rationalism (Gare, 1996; McGilchrist, 2009) and the free market system; rational thought is that which maximises financial or material gain (Brien, 1997). Furthermore, economic rationalism has managed to permeate all levels of society leading to laypeople assuming that others act in relation to their self-interest to maximise gain (Miller 1999), despite people not actually being self-interested (e.g., Miller & Ratner 1998; Ratner & Miller, 2001). This does not however, only affect laypeople; it also influences corporate and political decision making on the assumption that consumer and voting behaviour is driven by self-interest. Commercial media frequently appeals to individual self-interest (Brien 1997; see also Buijzen & Valkenburg, 2003; DeBord, 1995; Kasser et al., 2011), as the measure of success over a political term is often the actualisation of financial goals, such as national economic growth (Stevenson 2009). Thus, while self-interest is inherent at individual and societal levels within Western civilisation as a result of mechanistic thinking (Gare, 1996; McGilchrist, 2009), as previous research (i.e., Henrich et al., 2010) has indicated, self-interest may not be a dominant focus in all cultures.

**Individualism, collectivism, and relational self-construals**

Despite the spread of capitalism and liberal ideologies, social norms and values based on either holistic (e.g., ancient Chinese) or mechanistic (e.g., ancient Greek) traditions may
influence everyday cognitive functioning of people today, depending on their extant culture (Gare, 1996; Nisbett, 2003; Nisbett et al., 2001; McGilchrist, 2009). Markus and Kitayama (1991) propose that Asian countries are collectivistic as a result of the perception that one is interdependent on others, embedded within a broader social context, and that this view influences the perception of other objects and events. These holistic principles are in contrast to conceptualisations of one as independent of broader social contexts (i.e., mechanistic), which emphasises individualism (Markus & Kitayama, 1991) and self-interest (e.g., Miller, 1999; Miller & Ratner, 1996, 1998). Research has consistently found support for collectivistic, interdependent, communal, and relational ways of being in Asian societies, and independent individualism in Western cultures (e.g., Chiu, 1972; Fiske et al., 1998; Hofstede, 1980; Hsu, 1981; Markus & Kitayama, 1991; Sampson, 1989; Triandis, 1972, 1989, 1995). It should be noted however, that culture is unlikely to be a deterministic influence. That is, just because someone lives in a mechanistic, individualistic culture, does not infer that they will become mechanistic or individualistic.

For example, using a sample of Western academics, Johnson, Germer, Efran, and Overton (1988) found that behavioural psychologists were more mechanistic than developmental and personality psychologists and sociobiologists. Thus, there were within-culture differences in levels of organicism and mechanism. In addition, Nisbett et al. (2001) suggest that social orientation within cultures is associated with differences in field dependence, or the extent to which people consider contextual factors. Farmers have been found to be more field dependent than hunters, herders, or industrialised people (Berry, 1967; Witkin & Berry, 1975). In addition, Orthodox Jewish boys have been found to be more field dependent than secular Jewish boys, who are more field dependent than Protestant boys (Adevai, Silverman, & McGough, 1970; Dershowitz, 1971). It has also been found that a collectivistic orientation is more typical of women, whereas individualism is more typical of
men (e.g., Hofstede, 1980; Triandis, 1994). Hardie (2009) found that individualism tended to decrease with age, whereas collectivism increased. Similarly, a focus on intrinsic aspirations (e.g., community feeling; Grouzet et al., 2005) has been found to increase with age (Kasser & Ryan, 1993, 1996). Both studies may have been influenced by an underlying change in levels of holistic thinking with age (i.e., people may become more holistic as they get older, and thus become less individualistic and less focussed on extrinsic aspirations). Ultimately, these studies suggest that individualism and collectivism are found in all cultures. As Western civilisation is built on mechanistic principles emphasising an individualistic way of looking at the world (Gare, 1996; McGilchrist, 2009), individualism and self-interest (e.g., Miller, 1999; Miller & Ratner, 1996, 1998) may be emphasised, but this does not discount the possibility of being holistic or having a collective self-construal.

It has also been suggested that there is a third self-construal; a relational sense of self, in which one is defined by relationships with others (Y. Kashima, Yamaguchi, Kim, Choi, Gelfand & Yuki, 1995). It has been found that women, in both Asian and Western cultures, tend to be more relational than men (e.g., Cross & Madson, 1997; Hardie, 2009; E. Kashima & Hardie, 2000; Y. Kashima et al., 1995). Thus, relational self-construals can occur in mechanistic, individualistic cultures. McGilchrist (2009) suggests that individualism arising from mechanistic thinking is not inherently negative providing it is contextualised by an awareness of broader, contextual factors. Similarly, Deci and Ryan (1985, 2000) suggest that autonomy is not about the selfish pursuit of personal goals, but the harmonious integration of external rules and demands into self-directed action. Thus, individual goals can be pursued, but not at the expense of relational goals or concerns, or to the detriment of other people. Thus, it may also be the case that people who are individualistic may have a holistic, relational sense of self.
Therefore, while self-interest may be a normative value in Western civilisation (Gare, 1996; McGilchrist, 2009; Miller, 1999), it may not be equally evident in all people due to within-culture differences. In addition to self-interest, it is also expected that mechanistic thinking may influence the goals and aspirations individuals deem important in life, which may have implications for the extent to which one cares for one’s community and the environment (Gare, 1996; McGilchrist, 2009). Research examining extrinsic aspirations has provided findings which accord with these expectations.

**Extrinsic aspirations, individualism, and interpersonal relationships**

Gare (1996) and McGilchrist (2009) suggest that mechanistic individuals are likely to have competitive, instrumental, utilitarian, Machiavellian relationships with others. Higher levels of extrinsic aspirations are associated with maintaining relationships for instrumental reasons (e.g., “If a friend can’t help me get ahead in life, I usually end the friendship”; Khanna & Kasser, 2001, as cited in Kasser, 2002) and lower levels of empathy (Sheldon & Kasser, 1995). Individuals who place high levels of importance on extrinsic aspirations report having short relationships with fewer positive qualities (i.e., trust, acceptance, friendship) and more negative qualities (i.e., jealousy; Kasser & Ryan, 2001); greater pressure to conform to the ideals of others, and to feel detached in relationships (Khanna & Kasser, 2001, as cited in Kasser, 2002); and to be more competitive with others (Sheldon et al., 2000). In addition, those who report higher scores on materialism tend to report having less meaningful relationships with others (e.g., Cohen & Cohen, 1996; Kasser & Ryan, 1993; Keng, Jung, Jivan, & Wirtz, 2000; Richins & Dawson, 1992; Ryan et al., 1999; Schmuck et al., 2000). Consistent with instrumental, utilitarian views of the self or other people and the mechanistic tendency to use market metaphors (Gare, 1996; McGilchrist, 2009), Ahuvia and Adelman (1993) found that materialistic individuals tended to use market metaphors when dating, considering themselves as a product to ‘sell’.
**Pro-social behaviours and Machiavellianism**

Richins and Dawson (1992) also found that highly materialistic individuals, when offered a hypothetical $20,000 and asked how to spend it, tended to spend three times as much on themselves and to give less money to family and charity than less materialistic individuals. McHoskey (1999) found that higher levels of extrinsic aspirations and materialism were associated with a lower likelihood to lend money or do volunteer work. McHoskey also found that extrinsically motivated individuals tend to be more Machiavellian (e.g., “Never tell anyone the real reason you did something unless it is useful to you”). Additionally, Sheldon et al. (2000) also found that more extrinsically motivated individuals were less likely to cooperate and more likely to deceive group members in order to attain greater personal rewards.

**Caring about the environment**

Gare (1996) and McGilchrist (2009) suggested that the utilitarian nature of mechanistic thinkers to pursue tangible, quantifiable outcomes such as wealth tends to result in the view that the environment exists as resources to be exploited for human gain rather than as a complex ecosystem which humans are dependent on for survival. Individuals who are more focussed on material acquisition or wealth appear to care less about natural beauty (e.g., “trying to make our cities and countryside more beautiful” p.128; Inglehart, 1971, 1997), have less desire to protect the environment (S. Schwartz, 1992, 1994, 1996), tend to engage in more environmentally damaging behaviours (e.g., choosing to drive a car than ride a bike; Richins & Dawson, 1992), engage in fewer environmentally-friendly behaviours and have more negative attitudes towards the environment (Saunders & Munro, 2000).

**Conclusion**
Overall, these findings accord with the theory of Gare (1996) and McGilchrist (2009), who suggested that mechanistic thinkers should be more individualistic, more self-interested, to have instrumental relationships with others, and to care less about the environment. This suggests that a relationship between mechanistic thinking and extrinsic aspirations is plausible (and conversely, a relationship between holistic thinking and intrinsic aspirations). Therefore, in combination with the historical and cultural (e.g., Gare, 1996; Nisbett, 2003; McGilchrist, 2009), psychophysiological (McGilchrist, 2009), and cognitive (Buchtel & Norenzayan, 2009; Evans, 2008), it appears that holistic and mechanistic thinking are worthy of consideration in attempting to understand the reasons why people choose to pursue intrinsic or extrinsic aspirations and materialistic goals.

A number of attempts have been made to measure dichotomous perspectives which accord with holistic and mechanistic thinking. Based on the work of Nisbett and colleagues (see Nisbett, 2003 for a review), Choi, Koo, and Choi (2007) developed the Analytic-Holistic Scale. Based on the work of Pepper (1942), the World Hypothesis Scale (Harris, Fontana, & Dowds, 1977), Organismic Mechanistic Paradigm Inventory (Johnson et al., 1988), were developed. The Social Paradigm Belief Inventory (Kramer, Kahlbaugh, & Goldston, 1992), incremental and entity lay theories (see Dweck, Chiu, & Hong, 1995 for a review), and the Belief Systems Assessment Scale (Montgomery, Fine, & James-Myers, 1990) also accord with the holistic/mechanistic dichotomy. The suitability of these measures in relation to the current study will be discussed.
Chapter 15: Measurement of constructs which accord with holistic and mechanistic thinking

Analytic Holistic Scale

Based on findings that Asians tend to be holistic and Americans analytic (see Nisbett, 2003 for a review) Choi et al. (2007) developed the Analytic Holistic Scale (AHS). Choi et al. acknowledge that while the analytic-holistic dichotomy was developed from a perspective emphasising between-culture differences, there may be applications for the AHS to investigate within-culture applications. Similarly, research on individualism and collectivism began with between-culture differences before progressing to examining differences within cultures (e.g., Oyserman, Coon, & Kemmelmeier, 2002; Triandis, 1995). Derived from previous research (see Nisbett, 2003 for a review), Choi et al. (2007) identified four factors as being essential to the analytic-holistic dichotomy.

The first factor, locus of attention, measures the extent to which individuals generally examine individual parts or the overall whole. This is based on research suggesting that Westerners tend to focus more on an object than the field (e.g., Ji et al., 2000; Masuda & Nisbett, 2001). The second factor, causality, examines the extent to which dispositional, contextual factors are used in judging the behaviour of others or the outcome of events. Choi et al. (2003) have found that East Asians tend to consider a wider range of information than Americans before making decisions, which is likely to be a reason why East Asians have also been found to be less likely than Americans to make fundamental attribution errors (e.g., Choi & Nisbett, 1998; Choi et al., 1999; Lee et al., 1996; Morris et al., 1995; Morris & Peng, 1994). The third factor, perception of change, assesses whether reality is considered to be in a constantly changing, dynamic state of flux, or the belief that objects do not change dramatically over time and that existence is largely static. Ji, Nisbett, and Su (2001) in
addition to Peng and Nisbett (1999) have found that East Asians tend to assume that change is constant whereas Americans have a linear perspective in which patterns of change or stability will exist in the future as they existed in the past. The final factor, attitude toward contradiction, measures the extent to which one relies on formal logic rather than dialectical approaches in attempting to develop understanding or find the truth. As Peng and Nisbett (1999) found, East Asians tend to prefer a ‘middle way’ approach where differing perspectives can both be seen as being right depending on context or perspective. Americans in comparison prefer to find absolute answers. Gare (1996) and McGilchrist (2009) suggest that a tendency to use rigid, definitive categories and using rule-based logic to find definitive answers is typical of mechanistic thinking.

Validity of the AHS. There are some concerns with the validity of the AHS. Choi et al. (2007) conducted confirmatory factor analyses on two, three, and four factor models. A four factor model provided a better fit with the data than either two or three factor models. Only one fit index (the GFI) was reported, which was .88 in one study and .74 in a second. This is below the .95 cut-off suggested by Tabachnick and Fidell (2007). Thus, while four factors may have provided better model fit than the alternatives, the four factor model may not have been a sufficient fit with the data overall. Choi et al. (2007) found the overall reliability of the AHS to be adequate (α = .74), however items comprising the perception of change (α = .58) and locus of attention (α = .56) factors had quite poor reliability. A number of other problems may be evident with the measure.

Problems with the locus of attention and causality factors. As part of the item-selection process to derive the locus of attention factor, Choi et al. (2007) used an exploratory factor analysis, using a factor loading cut-off of .30. One item (“It is not possible to understand the parts without considering the whole picture”) with a factor loading of .38 also loaded on the causality factor (.30). In addition, another locus of attention item (“We should
consider a situation a person is faced with, as well as his/her personality, in order to understand one’s behaviour”) conceptually exists as a causality item. That is, contextual factors (i.e., the situation a person is faced with) should be considered in addition to dispositional factors (i.e., personality) to understand a person’s behaviour. Accordingly, Choi et al. suggest that the causality factor is intended to assess whether one considers contextual or situational factors. The reason for some of the similarities and the overlap between these two factors may be due to the underlying nature of contextuality (Pepper, 1942). That is, a broad awareness of the ‘big picture’ (i.e., locus of attention) also involves an inherent awareness of contextual factors.

**Problems with the attitude toward contradiction factor.** The attitude toward contradiction factor may have issues as a result of being too culturally derived. Rather than being solely about the dialectical approach of finding the ‘middle way’ or the opposing tendency to seek definitive answers, some items appear to measure a collectivistic desire to maintain group harmony by avoiding conflict. For example, “It is desirable to be in harmony, rather than in discord, with others of different opinions than one’s own”, or “It is more important to find a point of compromise than to debate who is right/wrong, when one’s opinions conflict with other’s opinions”. If the underlying difference between East Asians and Americans is a result of mechanistic/analytic and holistic thinking (see Nisbett, 2003 for a review), this does not presuppose a desire to uphold group harmony. One could be holistic but still be willing to stand by one’s convictions rather than acquiesce to group opinion. Furthermore one item (“Choosing a middle ground in an argument should be avoided”, factor loading = .47) also cross-loaded on the perception of change (.35) factor. The attitude toward contradiction factor was found by Choi et al. (2007) to be correlated with higher levels of collectivism and interdependent rather than independent self-construal. This supports the notion that attitude towards contradiction may measure a normative approach (i.e., the desire
to avoid social conflict and maintain group harmony) that may be typical of collectivistic, interdependent cultures, rather than a core component of holistic thinking.

Additional assessment of the validity of the AHS was undertaken by Lechuga, Santaos, Garza-Caballero, and Villareal (2011) in a study comparing Mexicans to Americans. Similar to Gare (1996) who suggested that colonialism is the legacy of mechanistic Western Europeans, Lechuga et al. (2011) suggested that ancient Aztec and Mayan thought displayed similarities to holistic ancient Chinese thought, and thus deviated greatly to the style of thinking introduced by Western European colonisers. In a large sample (N = 1041), Lechuga et al. found a four factor model, similar to Choi et al. (2007). Despite this, a number of items did not load significantly on any factor or cross-loaded on the wrong factor. For example, within the perception of change factor, “Current situations can change at any time” was found to load more strongly on the causality factor. CFA results indicated that the four-factor model proposed by Choi et al. was not a good fit with the data (Lechuga et al., 2011). Furthermore, GFI was reported to be .85, which was similar to the GFI statistics (.88 and .74) reported by Choi et al. (2007), further indicating that the original model reported by Choi et al. may not have provided adequate model fit. Over multiple analysis, based on recommendations suggested by modification indices, Lechuga et al. (2011) removed 10 items from the AHS. After removing these items, a four-factor model provided adequate fit and was superior to three, two or one factor models. Using the shortened AHS, it was found that Mexicans scored significantly higher than Americans overall on the ATC and locus of attention factors. Contrary to expectation, Americans scored higher than Mexicans on perception of change. No significant differences were found on the causality subscale or on overall AHS scores (Lechuga et al). However, the unexpected results may indicate the Mexicans are more similar to Americans than ancient Aztecs or Mayans. Despite concerns with the factor structure of
the AHS, it has been found to perform in accordance with theory when comparing Asian and American respondents.

A cross-cultural study using Korean and American undergraduates indicated that Koreans scored significantly higher overall and on each subscale than Americans, indicating greater levels of holism (Choi et al., 2007). As mentioned earlier, this may reflect that some items (e.g., within the attitude toward contradiction factor) may be more culturally applicable to collective Asian rather than independent Western respondents. Despite this, within-culture differences were also found using samples of undergraduate Korean psychology students and Korean Oriental Medicine students. Oriental Medicine is based on an adherence to the principles of holistic thinking typical of East Asia (Kaptchuk, 2000; Nisbett, 2003). Previous research has found that Oriental Medicine students in Korea were more holistic than other Koreans (Koo & Choi, 2005). The results indicated that the Oriental Medicine students scored significantly higher on the AHS overall than the Korean psychology students, and also on the locus of attention and causality subscales. No significant differences in mean scores on attitude toward contradiction or perception of change factors were found (Choi et al., 2007).

In a separate sample of Korean students, Choi et al. found that those scoring above the median on the AHS (and thus classified as being holistic), were more likely to use family resemblance rather than logical rules when categorizing objects (see Norenzayan et al., 2002). Choi et al. (2007) also replicated the study of Choi et al. (2003) which involved asking participants to examine information pertaining to a hypothetical murder case. It was found that Korean students with higher AHS scores (i.e., higher levels of holism) significantly excluded fewer items than those who were more analytic, indicating a greater propensity to consider contextual information rather than individual dispositions when attempting to explain causality. The AHS has also been used in other studies.
**Additional research using the AHS.**

Konrath, Bushman, and Grove (2009) found that higher AHS scores were associated with significantly lower levels of narcissism. Higher AHS scores were also significantly associated with higher scores on a measure of interdependent self-construal, but not with having an independent self-construal. Thus, holism was associated with viewing oneself as comprising part of a broader social whole than as an atomistic individual (see Gare, 1996; McGilchrist, 2009).

A large cross-cultural study (Klein et al., 2009) found significant differences between mean AHS scores across all nationalities in the sample. Malaysian respondents reported the higher AHS scores (i.e., higher levels of holism), followed by South Koreans. The next most holistic countries were India, China, and Japan, which did not significantly differ from each other. One Indian sample was not significantly different to one of the two American samples, which reported the lowest mean scores on the AHS (i.e., more analytic). Similar to previous research (i.e., Choi & Nisbett, 1998; Morris & Peng, 1994) it was also found that participants from East Asian countries who scored higher on the AHS were less likely to exclude contextual information when provided with a hypothetical scenario, whereas the American and Indian participants excluded a significantly greater amount of information. Other studies have provided mixed support for the efficacy of the AHS.

In a small sample of Taiwanese undergraduates ($N = 66$), Jen and Lien (2010) found no significant difference between the dispositional attributions made by participants classified as being either analytic or holistic (based on being above or below the mean respectively) under conditions of high cognitive load. Participants were also shown a video in which a woman acted anxiously whilst talking about either an anxiety-provoking topic or a neutral topic. It was expected that analytic respondents would consider the woman’s anxiety to be
dispositional in the neutral topic condition. Again, no significant differences were found between analytic and holistic thinkers in increased or normal cognitive load conditions, or between the anxiety or normal topic conditions. This may be an issue with the process of categorising the participants into groups based on scoring above or below the mean. The difference in means between the two groups was not large (analytic $M = 4.85$, holistic $M = 5.46$) and Jen and Lien did not mention whether this difference was significant. Furthermore, the study comprised a small sample size. Thus, the two groups may have existed as an artificial difference created by the authors rather than genuine representations of holistic and analytic thinkers. Despite this, the authors suggested that the observed group means were similar to those found by Choi et al. (2007) who also defined groups based on being above or below the median score.

**An introduction to root metaphors and world hypotheses**

Another conceptualisation of the holistic and mechanistic dichotomy was provided by Pepper (1942). Pepper contended that there are no objective facts or absolute truths because all knowledge is a participatory process in which conclusions are influenced by one’s existing perspectives which are influenced by social factors (see also Hegel, 1830/1991, 1830/1970, 1830/1971, 1821/2001; Herder, 1765-1797/2004). While conceptually similar to metaphysics or worldviews, Pepper referred to these fundamental perspectives as world hypotheses, as they were considered to provide the fundamental means through which people comprehend all aspects of life and reality. Four world hypotheses were proposed; mechanism, formism, organicism, and contextualism.

Mechanism, much like the conceptualisations provided by Gare (1996) and McGilchrist (2009), was considered by Pepper (1942) as the belief that the universe is like a machine comprising discrete parts which can be examined separately and understood in
isolation of broader contexts. Each part has no intrinsic relationship with any other part but can be understood as having independent effects on, or to be affected by other parts within a system. Pepper considered mechanism to be similar to formism.

Formism involves the belief that universal similarities exist among events or things in the universe which enable them to be understood and classified accordingly. Meaning and structure can be developed by classifying or categorizing things on the basis of definable characteristics or observable similarities (Pepper, 1942). Formism is similar to Plato’s (e.g., 2008, 2011) theory of Forms, as the abstract ideas which represent the underlying essence of what is observed are considered to be more real than the material world which comes to be known through subjective sensation and perception. Formism that involves the belief that knowledge of the universal forms or types is what constitutes real knowledge (Pepper, 1942).

Organicism is similar to the notion of holistic thinking as explained by McGilchrist (2009) and Nisbett (2003). Pepper (1942) conceptualised organicism as the belief that the universe is like an organism, comprised of complex systems of inherently interrelated and interdependent processes and components. Unlike mechanism in which the universe is seen as discrete entities with linear or simple causal relationships connecting them, organicism involves viewing all things as being inherently part of a greater whole, in which meaning is entirely dependent on the context which an entity is embedded within and contributes to. For this reason, organicism was considered to be highly related to contextualism (Pepper).

Contextualism examines the extent to which one considers there to be no absolute truth or understanding (Pepper, 1942). This is similar to the Chinese dialectical principle of contradiction and the ability to seek the ‘middle way’ by being aware of how contextual factors affect subjective interpretation (Peng & Nisbett, 1999). Pepper’s (1942) root metaphors were used as the theoretical basis for the World Hypothesis Scale (WHS; Harris,
World Hypothesis Scale. The WHS (Harris et al., 1977) is purported to measure each of Pepper’s (1942) world hypotheses; mechanism, formism, organicism, and contextualism. The WHS appeared to show adequate criterion validity. Harris et al. (1977) found in a sample of university students that WHS factor scores were generally in accordance with jobs that were appealing to these students. For example, those scoring highest on mechanism were likely to select businessperson or manager (i.e., jobs with a focus on external outcomes, such as financial gain which is typical of mechanistic thinking; see Gare, 1996; McGilchrist, 2009) as a preferred career. The results also suggested that people who felt that their worldview was compatible with that of their friends (e.g., a contextualist with an organicist friend) felt that they had more in common, a better chance of remaining friends and a greater ability to work together than participants who felt that they were incompatible (e.g., a mechanist with an organicist friend). Harris et al. (1977) also examined compatibility between dominant world hypotheses and therapeutic outcomes. Formistic and mechanistic individuals tended not to do well in group therapy but to prefer the more structured environment of Alcoholics Anonymous meetings. It was also found that clients who had world hypotheses which were compatible with their therapist tended to rate their therapeutic interaction more positively and also attended a greater number of sessions than individuals who were seeing an incompatible therapist. There are however, a number of apparent problems with the WHS.

The major problem with the WHS is the response format. Participants are provided with a sentence to provide context (e.g., “Alan is borrowing a lot of money”). Four responses are then provided with the assumption that participants will gravitate toward the answer which best represents their dominant root metaphor. The concern however, is that the four answers are not equivalent. For example, the response for organicism is, “Alan’s borrowing
money is now one stage in the development of his dependability. This development has roots in his past and there are stages in the future through which he will pass” (p. 539). For mechanism, “Alan is a borrowing a lot of money because he wants to buy a new car. Thus there is a specific reason for his borrowing money at this time”. These items do not simply ask people whether they think a mechanistic or organismic outcome is best, but to assess a hypothetical person’s motives framed vaguely within Pepper’s (1942) world hypotheses. While Harris et al. (1977) found that the WHS displayed adequate internal consistency, the WHS did not correlate as hypothesised with measures of authoritarianism, cognitive rigidity, dogmatism, Machiavellianism, verbal intelligence, or locus of control. The formistic thinking factor was also found to be correlated with vocabulary level, suggesting that reading comprehension may have influenced results. Thus, while the WHS appeared to show adequate criterion validity, there are concerns with convergent validity and the response format.

**Organismic-Mechanistic Paradigm Inventory.** Johnson et al. (1988) developed the Organismic-Mechanistic Paradigm Inventory (OMPI), to improve on the WHS (Harris et al., 1977). The OMPI comprises organicism and mechanism on a spectrum, with high scores representing organicism. These two root metaphors were chosen as Pepper (1942) suggested that formism may exist as an element of mechanism, and contextualism as a component of organicism. The decision to focus on organicism and mechanism as a bipolar continuum by Johnson et al. (1988) corresponds with the dichotomous mechanistic and holistic theoretical perspective of Gare (1996) and McGilchrist (2009), or analytic and holistic thinking (Choi et al., 2007; Nisbett, 2003; Nisbett et al., 2001).

In accordance with the proposed relationships between the four root metaphors (Pepper, 1942), Johnson et al. (1988) found that higher scores on the OMPI were correlated as expected with the four root metaphor scales comprising the WHS. The OMPI was
negatively correlated with mechanism and formism, and positively correlated with
organicism and contextualism. To further examine the validity of the measures, Johnson et al.
used OMPI and WHS scores to categorise psychologists from different theoretical
perspectives.

Johnson et al. (1988) assumed that behavioural psychologists would be more
mechanistic than developmental psychologists as a result of their view of persons as passive
who are reactively determined by environmental forces. This reflects the mechanistic (Gare,
1996; McGilchrist, 2009) and analytic (Nisbett, 2003) tendency to see all entities as discrete
and influenced by external, causal relationships. Developmental psychologists on the other
hand were expected to be more organismic due to their tendency to view human development
as being embedded within social contexts, according with holistic thinking (Gare, 1996;
McGilchrist, 2009; Nisbett, 2003). As expected, developmental psychologists obtained the
highest OMPI scores (i.e., organicism), whereas behaviourists reported the lowest OMPI
scores (i.e., mechanism). On the WHS, behaviourists scored highest on mechanism and
developmental psychologists scored highest on contextualism and organicism. Johnson et al.
(1988) also found that developmental and social biologists scored higher on the OMPI (i.e.,
were more organismic) than behavioural psychologists, police force applicants, or
engineering and medical students in Nigeria. More organismic individuals were also more
likely to describe themselves as being imaginative, creative, artistic, socially progressive, and
open to both change and complexity. Those who were identified as being mechanistic rated
themselves as being traditional, conservative, conventional, predictable, inartistic, cold to
others, and simplistic. Higher OMPI scores were also correlated with a tendency to have a
preference for careers with an artistic, creative, or social element (e.g., art teacher, architect,
lawyer, psychologist, sociologist). In comparison, only two conventional jobs (banker and
dental assistant) were associated with mechanism (Johnson et al.). Social scientists (e.g.,
Psychology, Sociology, Nursing) have also been found to be more organismic than traditional scientists (e.g., Chemistry, Mathematics, Microbiology) who appeared to be more oriented towards mechanism (Babbage & Ronan, 2000). These findings accord with the notion that mechanism is focussed on pragmatic, quantifiable outcomes (Gare, 1996; McGilchrist, 2009).

**Cross-cultural research using the OMPI.** In accordance with findings using the AHS (Choi et al., 2007) and general research indicating that East Asians tend to be holistic whereas Westerners tend to be analytic (see Nisbett, 2003 for a review), Japanese adults have been found to be significantly more organismic (i.e., higher OMPI scores) than American adults who tended to be more mechanistic (Chapell & Takahashi, 1998).

**OMPI research on Psychotherapists.** Research on student and practising psychotherapists has shown that those with a mechanistic orientation (i.e., lower OMPI scores) have a preference for behavioural or cognitive-behavioural therapy (Arthur, 2000; Lyddon & Adamson, 1992; Lyddon & Bradford, 1995). An organicist orientation was associated with constructivist approaches. That is, considering problems in life as developmental challenges associated with emotional variability, and that psychological change is a process involving emotional experience, expression and exploration (Lyddon & Adamson, 1992; Lyddon & Bradford, 1995) or psychoanalytic approaches (Arthur, 2000).

Neimeyer, Prichard, Lyddon, and Sherrard (1993) found that therapists with higher scores on the OMPI scored more highly on a thinking style which emphasises understanding the world through symbolic representations (e.g., music, art) rather than rationality or empiricism, and constructivist rather than behaviourist approaches. Vasco, Garcia-Marques, and Dryden (1993) found that behavioural and cognitive therapists scored higher on rationalism, and were also more mechanistic according to OMPI scores.
Research on general population samples. It has been found that first year law students who scored higher on the OMPI (i.e., organicism) reported a greater ethic of care for others (White & Manolis, 1997). Higher OMPI scores have also been associated with a greater likelihood to engage in health promoting behaviours (Kagee & Dixon, 2000). Babbage and Ronin (2000) found that higher scores on the OMPI (i.e., organicism) were also associated with higher scores on the NEO-PI-R (Costa & McCrae, 1992) personality traits of Openness to Experience and Agreeableness. Organicism was also associated with a preference for adjectives emphasising creativity; complexity in thinking; being active rather than passive; cooperation rather than stubbornness; empathy over self-centeredness; liberalism rather than conservatism; change over predictability; modern rather than old-fashioned; progressive than preserving; and experimental rather than conventional (Babbage & Ronan, 2000). Six of these pairs were the same as those found by Johnson et al. (1988).

Similar research by Botella and Gallifa (1995) found that increased cognitive complexity as a result of being an expert in a certain field was associated with more complex, constructivist epistemic assumptions (i.e., the extent to which contradiction is accepted; complexity of decision-making processes; the absolute or relative nature of knowledge; the extent to which divergent findings can be justified by contextual factors). Organicism was associated with these greater levels of cognitive complexity. Similar findings were also reported by Caputi and Oades (2001) who found that organicism was associated with a constructivist approach, and an emphasis on openness to environmental information.

Overall, these findings accord with the theory that holistic thinking should be associated with a view of the world which emphasises change and an awareness of contextual factors, in addition to other components of holistic thinking such as empathy and not focussing on external, quantifiable outcomes (see Gare, 1996; McGilchrist, 2009 for reviews). Despite this, there are a number of concerns with the OMPI.
Concerns with the OMPI. Johnson et al. (1988) did not perform EFA or CFA analyses on the OMPI, and no other studies have reported on factor structure or model fit. Considering that the OMPI was developed to measure philosophical (e.g., ontological, epistemological, analysis and causality, change, dynamics, methodology, and personhood domains) and practical (e.g., parenting, occupations, sexuality, legal, and interpersonal domains), a satisfactory one or two-factor solution may not be obtainable. There are also concerns with the content of various items.

Each response set includes a mechanistic and an organismic option, of which respondents are required to choose one (Johnson et al., 1988). These dichotomous, forced-choice scores are then compiled into an overall score. Thus, the OMPI may delineate between mechanistic and holistic thinking at an absolute level for each item, but based on the number of holistic responses chosen, provide a spectrum of how holistic respondents are. A number of items were identified as not according with holism or mechanism as described by Gare (1996) and McGilchrist (2009), and are also not expected to accord with the theory of Pepper (1942). For example, the first response set comprises the items, “Organisms change by forces from outside themselves” (mechanistic) and “Organisms can change themselves” (organismic). The concern with this item is that organisms can physically change from outside forces (e.g., heat, radiation), or mentally change as a result of external influence (e.g., education). Thus, a holistic person who considers external, contextual factors (Gare, 1996; McGilchrist, 2009; Nisbett, 2003) may select the mechanistic response. Response set seven comprises the holistic item “Before making a big decision, I like to sleep on it”, and the mechanistic item, “Before making a big decision, I like to get all of the information”. It is unclear how ‘sleeping on it’ may be holistic. Additionally, ‘getting all the information’ may be a holistic thing to do. For example, holistic Asian respondents tend to believe more information is useful in understanding a murder case than more analytic/mechanistic
American respondents (Morris et al., 1995; Morris & Peng, 1994). The eleventh response set comprised the holistic item, “I can change things in my family just by being who I am”, and the mechanistic item, “I can change things in my family only by planned action”. These items may also be influenced by personal or situational factors. For example, if someone was highly introverted, or from an especially abusive, domineering family, it may be unlikely that they would feel that they could change their family by being who they are. In such a case, planned action may be the most feasible method of creating change. A more assertive person may feel that they are able to change things just by being who they are. Therefore, this item may not distinguish between, or assess, levels of mechanistic or holistic thinking. Thus, while the OMPI (Johnson et al., 1988) appears to accord with the theory of Pepper (1942), Gare (1996) and McGilchrist (2009), there may be a number of items which do not accurately assess organismic (i.e., holistic) and mechanistic thinking.

**Social Paradigm Belief Inventory**

The Social Paradigm Belief Inventory (SPBI; Kramer et al., 1992) was developed from a developmental perspective, conceptualising the cognitive stages individuals may go through as they progress from adolescence into later adulthood. Kramer (1983) considered this gradual development to within three domains; awareness of the relative nature of knowledge, acceptance of contradiction, and the capacity to integrate knowledge into a greater dialectical whole. These categories are similar to the principles of change, contradiction and relationships which comprise Chinese dialectical thinking (e.g., Nisbett et al., 2001; Peng & Nisbett, 1999).

Kramer et al. (1992) proposed three factors to comprise the SPBI. The first factor, absolutism, refers to a style of thinking in which objects, elements or entities are understood by their basic forms or categories, or through reductionist scientific research. Absolutism also
involves the belief that the world is static and unchanging, that contradiction is intolerable and there must be absolute answers and definitive distinctions. The desire to reduce items to their basic categories corresponds with Pepper’s (1942) conceptualisation of formism, whereas the desire for absolute knowledge within an unchanging universe is akin to mechanistic thinking (e.g., Gare, 1996; McGilchrist, 2009; Pepper, 1942), and the acceptance or denial of contradiction has been found as a difference between East Asian (i.e., holistic) and American (i.e., analytic) thinking (Nisbett et al., 2001).

The second factor, relativism (Kramer et al., 1992) involves the belief that all knowledge and understanding is contextual and dynamic, and depends on each person’s unique viewpoint. This accords with Pepper’s (1942) root metaphor of contextualism, and the Chinese dialectical principle of contradiction (Peng & Nisbett, 1999). Therefore, relativism has some conceptual overlap with absolutism. According to Kramer et al. (1992), relativism can make prediction of outcomes impossible, and can also potentially make it difficult for individuals to act in the world, or result in feelings of anomie resulting from perceiving social norms and constructs to be meaningless. Thus, a third stage, dialectical thinking, was expected to supersede relativism by reorganising and integrating concepts of change and the relativity of knowledge into a more cohesive way of thinking.

Dialecticism, acknowledges the changing, dynamic nature of the universe, but considers contradictions as being part of a greater whole through which personal growth rather than listlessness can emerge. Furthermore, dialectical thinking is characterised by the concepts of emergence and reciprocity, as the dynamic, changing nature of all things constantly yields new structures, ideas and events, which in turn influence and change all other things (Kramer et al., 1992). Dialecticism is thus similar to the Chinese dialectical principle of relationships (Peng & Nisbett, 1999), organicism (Pepper, 1942) and holistic thinking (Gare, 1996; McGilchrist, 2009) which conceptualise all things as being inherently
interdependent and embedded within broader contexts. Ultimately, Kramer et al. (1992) suggest that absolutism corresponds with Pepper’s (1942) root metaphors of formism and mechanism, whereas contextualism and organicism correspond with the SPBI factors of relativism and dialecticism.

**Issues with the SPBI.** Kramer et al. (1992) developed the SPBI in combination with a qualitative component. Participants from various age brackets (i.e., 17-20, 22-39, 40-58, 60-83) were asked to answer an interpersonal dilemma corresponding to their age bracket. Based on their answers, participants were allocated to one of six categories: non-abstract and pre-formal; absolutist; transition between absolutism and relativism; relativistic; transition between relativism and dialecticism; and dialectical. These stages correspond with increasing levels of holism. After ensuring that the independent rating of each interview was accurate, a moderate to strong correlation ($r = .42$) was found between interview responses and SPBI scores. In terms of convergent and discriminant validity, high SPBI scores correlated significantly with high OMPI scores, and high levels of contextualism and low levels of formism and mechanism on the WHS. Contrary to expectation, the SPBI did not correlate with personality or vocabulary measures, social dogmatism, or intolerance of ambiguity.

In relation to each factor, dialecticism only correlated with the contextualism factor of the WHS and not organicism. Relativism correlated with higher OMPI scores ($r = .30$) and organicism, ($r = .20$), but not relativism. Absolutism however, was significantly associated with lower OMPI scores as expected, all four WHS factors, and social dogmatism and intolerance of ambiguity. In addition, absolutism was associated with lower scores on relativism and dialecticism. Relativism however, also correlated negatively with dialecticism. This finding was not mentioned by the authors but does not fit the argument that relativism and dialecticism should correspond with contextualism and organicism (see Kramer et al., 1992). That is, if relativism and dialecticism correspond with organicism, then they should
share a positive relationship. Despite this, Kramer et al. (1992) found that relativism appeared
to decrease with age whereas dialecticism appeared to increase with age. This is theoretically
consistent, as Kramer et al. suggested that dialecticism supersedes relativism as a stage of
development. In contrast however, Johnson et al. (1988) found that mechanism (and not
organicism) appeared to increase with age.

A potential problem with the Kramer et al. (1992) study is that convergent and
discriminant validity were provided for the scale as a whole, whereas criterion validity was
sought on each factor separately. By using total scale scores, Kramer et al. implicitly asserted
that their theory can be suitably measured on a bipolar scale, similar to the OMPI (Johnson et
al., 1988). Furthermore, in a study by Yang, Wan and Chiou (2010) using the SPBI, the
relativism response statements were removed, resulting in a bi-polar scale measuring formal
and dialectical thinking. This study found that higher scores on dialectical thinking were
associated with higher levels of creativity, whereas formal thinking (i.e., formal logic and a
desire to find absolute answers and outcomes) was negatively associated with variables
comprising creative thinking (Yang et al.). Similarly, individuals who score higher on the
OMPI (i.e., are more organismic) tend to value creativity more than those who are more
mechanistic (Babbage & Ronan, 2000; Johnson et al., 1988; Neimeyer et al.,
1993). Therefore, rather than three fixed stages of development, it may be that absolute,
relativist, and dialectical thinking exist on a continuum according with mechanistic/analytic
and holistic/organicist thinking. Therefore, the SPBI may provide no benefit over using either
the OMPI or AHS.

**Incremental and entity lay theories**

Dweck and colleagues (see Dweck, 1999; Dweck et al., 1995 for reviews) have also
suggested that there are two fundamental ways of understanding all aspects of life. Dweck et
al. (1995) using the process philosophy of Whitehead (1929, 1938) which was also influential on the views of Gare (1996), have suggested that there are two distinct views of reality, referred to as implicit lay theories. Similar to metaphysics (Gare, 1996; McGilchrist, 2009), worldview (e.g., Miller & West, 1993; Overton, 1991; Sarason, 1984; Wolman, 1973), or world hypotheses (Pepper, 1942), implicit lay theories are suggested to provide the framework through which judgements and reactions to external events and other people are made (Dweck et al., 1995). There are two implicit lay theories. An incremental lay theory accords with holistic, organismic thinking, in which the world is considered to be in a state of flux, and that the best approach to knowing the world is through understanding dynamic processes. In contrast, an entity lay theory, which accords with mechanistic, analytic thinking, entails a static view of the world in which unchanging dispositions and quantifiable outcomes are the primary means of knowing the world.

Due to the mechanistic approach of focussing on parts rather than the whole (e.g., Gare, 1996; McGilchrist, 2009; Nisbett, 2003; Pepper, 1942), entity theorists are more likely to assume that outcomes are primarily guided by the unchanging, dispositional traits of others (e.g., someone failed a test because they lack intelligence; Dweck et al., 1995). Conversely, the holistic approach of incremental theorists results in a tendency to focus on dynamic, contextual factors when explaining the causes of events (e.g., someone failed a test because of external factors that may have prevented them from studying; Dweck et al., 1995). This is consistent with findings that holistic East Asians are less likely to commit the fundamental attribution error by assuming that the behaviour of others is guided by unchanging dispositions (Morris & Peng, 1994; Nisbett, 2003; Nisbett et al., 2001), and organismic and mechanistic differences in contextualism (Pepper, 1942), as well as key aspects of mechanism and holism (McGilchrist, 2009).
**Measurement of incremental and entity lay theories.** Dweck et al. (1995) use different sets of three questions to assess implicit lay theories. For example, to determine whether one believes that intelligence is a static disposition (entity theorist) or is dynamic, changing, and context-dependent (incremental theorist), three questions (e.g., “You have a certain amount of intelligence and you really can’t do much to change it”; Dweck et al., 1995) are provided. There are also sets of questions to assess lay theories relating to morality (e.g., “A person’s moral character is something very basic about them and it can’t be changed”), other people (e.g., “The kind of person someone is something very basic about them and it can’t be changed much”), and the world in general (e.g., “Our world has its basic or ingrained dispositions, and you really can’t do much to change them”). Dweck et al. (1995) found that the intelligence and morality lay theories were associated with implicit theories about people in general, but this was not the case with the implicit world theory. It was also found that the implicit theories for intelligence, morality and the world were not related to gender, age, political affiliation, religious beliefs, locus of control, cognitive ability, confidence in intellectual ability, a range of scales associated with political ideologies and values, and socially-desirable responding. Despite the lack of potential convergent validity, incremental and entity lay theories have displayed criterion validity in a range of studies.

**Attribution of personal outcomes.** Entity theorists who consider intelligence to be a static trait tend to attribute academic failure to their own intellectual ability to a greater extent than incremental theorists. Incremental theorists tend to consider contextual factors, such as the amount of effort they put into studying (e.g., Blackwell, Trzesniewski, & Dweck, 2007; Henderson & Dweck, 1990). As a result, incremental theorists have more optimistic views on the benefits of putting effort into study, have stronger learning goals, tend to feel less helpless, and perform better in their studies than entity theorists (Blackwell et al., 2007).
Similarly, Nisbett (2003) suggests that the contextual nature of East Asians’ thinking results in them being less susceptible to feelings of failure in comparison to Americans. That is, failure is considered to occur for contextual reasons rather than as a direct result of personal incompetence or lack of ability. Thus, the extent to which dispositional or contextual factors are considered will influence whether individuals respond helplessly or in a mastery-oriented way after encountering setbacks (Diener & Dweck, 1978, 1980). Accordingly, entity theorists’ academic performance has been found to remain static or decrease in the transition from sixth-grade (primary school) to seventh-grade (high school). In comparison, students who were rated as incremental theorists either maintained their high level of achievement or increased at a rate greater than their peers, as a result of being better adapted to handling increased academic pressure (Blackwell et al., 2007; Henderson & Dweck, 1990).

**Attribution of motives governing the behaviour of others.** It was previously mentioned that holistic Chinese respondents tended to consider more contextual than dispositional factors in understanding a hypothetical person’s motivation to carry out a shooting in comparison to analytic Americans (Morris & Peng, 1994; Morris et al., 1995). Similarly, entity theorists, as a result of focusing more on dispositional factors, are more likely than incremental theorists to believe in punishment rather than remedial education when dealing with the negative behaviour of others (Chiu, Dweck, Tong, & Fu, 1997). Children who are rated as entity theorists have also been found to endorse greater levels of punishment for negative behaviour than incremental theorists (Erdley & Dweck, 1993). Entity theorists asked to read a transcript of a hypothetical murder case and provide a verdict for the defendant, tended to consider less contextual information and also displayed a bias towards greater levels of punishment compared to incremental theorists (Gervey, Chiu, Hong, & Dweck, 1999). A further study by Chiu, Hong, and Dweck (1997) presented participants with positive (e.g., risking one’s life to save another), negative (e.g., stealing a car), or neutral
(e.g., a person making their bed in the morning) behaviours. Entity theorists were more likely than incremental theorists to believe that these behaviours were the result of enduring moral dispositions. Both entity and incremental theorists however, rated the behaviours themselves as being similarly positive or negative. This suggests that implicit lay theories may not influence moral or ethical views, but how people and their interactions with the world are viewed (Dweck et al., 1995). Furthermore, when not attributed to any particular individual or group, incremental and entity lay theorists tend to rate positive and negative behaviours similarly (Chiu et al., 1997; Levy & Dweck, 1999; Levy, Stroessner, & Dweck, 1998). This suggests that entity theorists are not necessarily more extreme in their views than incremental theorists.

Despite this, entity theorists are more likely to assume dispositional causation for individual or group behaviours (Levy & Dweck, 1999) even when contextual factors are available (Erdley & Dweck, 1993), whereas incremental theorists are more likely to consider salient goals, needs or emotional states (Levy & Dweck, 1998). Entity theorists were more likely than incremental theorists to assume that behaviour will be consistent across different situations (Chiu, Hong, & Dweck, 1997). Hong, Chiu, Dweck, and Sacks (1997) found that entity theorists, but not incremental theorists, were faster at associating high scores on an aptitude test for a trainee pilot with positive words (e.g., lovely), and low scores with negative words (e.g., gruesome), indicating a tendency to focus on a single aspect to make dispositional judgements.

Categorising people. Levy et al. (1998) found that entity theorists tend to endorse positive and negative stereotypes about other racial or ethnic groups more than incremental theorists, indicating a tendency to focus on traits rather than contextual factors. Levy et al. also found that entity theorists tend to judge unfamiliar groups more expediently and with a bigger focus on traits than incremental theorists. Entity theorists have also been found to be
more negative towards out-group members in comparison to incremental theorists during intergroup conflict (Chiu & Hong, 1999). Entity theorists have also been found to display a greater belief than incremental theorists that both out-group and in-group members are homogenous (Levy et al., 1998; Levy, Plaks, Hong, Chui, & Dweck, 2001). Bégue and Apostolidis (2001) found that heterosexual entity theorists believed that they were more dissimilar to homosexuals and shared less common values than did heterosexual incremental theorists. The finding that entity theorists are more likely than incremental theorists to believe that in-group and out-group members differ greatly has also been observed in samples of American school children (Levy & Dweck, 1999) and Hong Kong university students (Hong, Chiu, Yeung, & Tong, 1999).

The nature of incremental and entity theories. All people have the capacity for analytic/mechanistic or holistic ways of thinking (McGilchrist, 2009; Nisbett, 2003; Nisbett et al., 2001). Accordingly, Levy et al. (1998) found that when primed with an entity (e.g., scientist talking about how personality cannot change) or incremental (e.g., personality can change) theory, children were found to make judgements in accordance with the primed implicit lay theory. Providing individuals with information which provides an incremental perspective also appears to result in a reduced tendency to rely on traits (Chiu, Hong, & Dweck, 1997) or make judgements in accordance with stereotypes (Levy et al., 1998). An intervention emphasising incremental views was also found to help improve academic performance (Blackwell et al., 2007).

In terms of cross-cultural research, Chiu, Hong, and Dweck, 1997) found similar proportions of entity and incremental theorists in North American and Hong Kong samples. Other research has found that incremental theorists are more prevalent than entity theorists in Hong Kong compared to American samples (Chiu, Dweck, et al., 1997; Chiu & Hong, 1999). Chiu, Dweck et al. (1997) found that in both American and Hong Kong samples, entity
theorists were more likely to endorse duty-based morality (i.e., upholding social norms and institutions), whereas incremental theorists from both cultures tended towards right-based (i.e., upholding inherent, natural human rights) morality. Therefore, Entity and Incremental lay theories appear to exist across cultures and age groups (Levy et al., 2001), and these ways of thinking may also be malleable (Levy et al., 1998).

**Concerns with incremental and entity lay theories.** Entity and incremental lay theories have generally performed in accordance with expectations (see Dweck et al., 1995 for a review), which would also be expected based on the theory of holistic and mechanistic thinking (Gare, 1996; McGilchrist, 2009). The main concern with entity and incremental lay theories is the measurement used. As holistic and mechanistic thinking are general metaphysical perspectives, their influence should pertain to how all aspects of life are understood or perceived. By assessing specific domains (e.g., intelligence), entity and incremental theories may not assess the general nature of these perspectives. In addition, it is believed that there may be problems with some of the items.

For example, an item assessing lay theories related to the world in general is, “Though we can change some phenomena, it is unlikely that we can alter the core dispositions of our world”. This item may be influenced by what one considers to comprise ‘core dispositions’. A core disposition for example, could be the fact that the Earth rotates on its axis while orbiting the Sun. This disposition is unlikely to be changed by human forces. A holistic person who understands astrology and physics might thus select ‘Strongly Disagree’, which would categorise them as an entity theorist. Similarly, one of the intelligence items, “Your intelligence is something about you that you can’t change very much” might be influenced by the way in which intelligence is conceptualised. For example, Intelligent Quotient scores tend to be relatively stable throughout one’s lifespan (Mackintosh, 2011). In this sense, intelligence, conceptualised as IQ, may not change very much. However, if intelligence were
conceptualised as one’s skills, abilities, or ways of assessing various situations, intelligence may change depending on circumstances or based on experience (e.g., a situation where you have prior experience compared to a novel situation). Thus, the way in which intelligence is conceptualised may influence whether one is categorised as being an entity or incremental theorist regardless of underlying levels of holism or mechanism.

**Belief Systems Analysis Scale**

Based on observations of traditional African cultures, the Belief Systems Analysis Scale (BSAS; Montgomery et al., 1990) was developed to measure an Afrocentric belief system. The BSAS comprises two factors; optimal and suboptimal thinking. Optimal thinking involves a holistic world view in which all things are connected; a dialectical approach to logic which is accepting of contradiction; and awareness that knowledge is influenced by one's own prior beliefs and perspectives. Similar to the holistic East Asian focus on communalism (e.g., Markus & Kitayama, 1991; Nisbett, 2003; Nisbett et al., 2001), optimal thinking also includes values emphasising interpersonal relationships, and group harmony. Additionally, in accordance with mechanistic thinking as suggested by Gare (1996) and McGilchrist (2009), the suboptimal view measured by the BSAS involves a segmented, atomised worldview incorporating absolutist, dichotomous logic, and the belief that knowledge and truth exist separately from the individual and can be understood objectively through observation. Suboptimal thinking also comprises individualism, mastery and control, personal achievement, and the pursuit of external criteria such as the acquisition of objects to define oneself (Montgomery et al., 1990). The factor structure and face validity of some items however, suggest that the BSAS is worthy of improvement, despite displaying convergent validity.
Concerns with the BSAS. The BSAS comprises 31 items with higher scores reflecting the optimal Afrocentric worldview. In a modest sample ($N = 140$), the BSAS was found to have adequate overall and test-retest reliability, and correlated strongly with higher scores on a measure of one’s interest in pro-social behaviours ($r = .50$), low scores on dogmatism ($r = -.51$), and a moderate to strong ($r = -.38$) relationship with low scores on a measure of psychological distress (Montgomery et al., 1990). A study using an earlier version of the BSAS found that mothers with higher scores reported higher levels of self-esteem, less anxiety and depression, and more satisfaction in being a mother (Fine, Schwebel, & Myers, 1985).

One issue with the BSAS is that some items are open for interpretation depending on one’s stage in life. For example, “I feel badly when I see friends from high school who now have better cars, clothes, or homes than I do”, may be more applicable to middle-aged individuals rather than undergraduate students who have recently completed high school. Another item, “Past philosophers like St. Augustine and Descartes are less relevant today than they were 100 years ago before the modern age” may not discriminate well between those who have a holistic, Afrocentric worldview from those who lack knowledge about philosophers.

Another concern with the BSAS is that Montgomery et al. (1990) found that the items resulted in five factors which did not necessarily fit the theory from which the scale is derived. The factors were interpersonal valuing (i.e., interpersonal relationships over material acquisition); de-emphasis on appearance (i.e., degree to which material factors are considered when making decisions); integration of opposites (i.e., the extent to which progress is viewed as a dialectical process); non-material based satisfaction (i.e., the extent to which wellbeing is defined by material gain); and optimism (i.e., degree to which one considers positive outcomes in situations). With the exception of integration of opposites, which appears to
measure dialectical logic and subjective understanding typical of an optimal Afrocentric worldview, three of the four remaining factors appear to be aligned with intrinsic (i.e., relationships rather than material gain; non-material satisfaction) and extrinsic (i.e., appearance) aspirations (see Grouzet et al., 2005; Kasser & Ryan, 1993, 1996). While Gare (1996) and McGilchrist (2009) suggest that mechanism can lead to a greater focus on extrinsic aspirations and quantifiable outcomes, these three factors do not cover the breadth of Afrocentric worldviews as suggested by theory. For example, Montgomery et al. (1990) did not find a factor pertaining to the awareness that knowledge is influenced by pre-existing beliefs and perspectives.

The remaining factor, optimism, has no theoretical reason to be a part of an Afrocentric worldview, as both optimal and suboptimal views may involve optimism. It was previously mentioned that the right hemisphere provides contextual awareness (McGilchrist, 2009) and may provide more pessimistic views than the left hemisphere (Lazure & Persinger, 1992; Persinger & Makarec, 1991). The left hemisphere (in individuals with damage to their right hemispheres) can overlook obstacles or shortcomings which can prevent success (Stuss, 1991). Thus, a suboptimal Afrocentric perspective, providing it accords with left hemispheric (i.e., mechanistic) functioning, may involve unrealistic optimism as a result of overconfidence. In addition, McGilchrist (2009) suggests that holism may be associated with depression rather than optimism due to being aware of negative aspects of the world. However, both McGilchrist and Gare (1996) suggest that mechanism may lead to greater levels of depression and negative affect due to a nihilistic focus on extrinsic rather than intrinsic goals and sources of meaning in life. Thus, there is no obvious argument suggesting that one way of thinking should emphasise optimism more than the other. Additionally, the items comprising the optimism factor (e.g., “Although I have a favourite kind of music I
listen to, I can usually get into and enjoy most kinds of music”) appear to represent open-mindedness (e.g., Costa & McCrae, 1992) rather than optimism.

Montgomery et al. (1990) also reported that a further five items did not load on any factor. Ideally for factor analysis, there should be 20 cases for each variable examined, or at minimum, five cases for each variable (Tabachnick & Fidell, 2007). Considering that the BSAS comprises 31 items, a minimum sample size for factor analysis should have been 155 participants, with an ideal of 620. As the study did not have a sufficient sample ($N = 140$) to meet either criteria, a better factor structure may have been found with a larger sample. Therefore, while emerging from a theoretical perspective according to holistic and mechanistic thinking (e.g., Gare, 1996; McGilchrist, 2009; Nisbett, 2003) issues with the factor structure and content of the items suggest that the BSAS may not be the most effective measure of these dichotomous metaphysical perspectives.

Conclusion

There are six possible measures to include in the second study to assess holistic and mechanistic orientations; the AHS (Choi et al., 2007), WHS (Harris et al., 1977), OMPI (Johnson et al., 1988), SPBI (Kramer et al., 1992), incremental and entity lay theories (Dweck, 1999; Dweck et al., 1995), and the BSAS (Montgomery et al., 1990). Based on the review provided, it appears that the AHS, OMPI, and lay theories are the constructs and scales which most closely accord with, but are by no means a direct measure of, the theory of holistic and mechanistic thinking provided by Gare (1996) and McGilchrist (2009). All three measures were also deemed to include unsatisfactory items. An additional concern with entity and incremental lay theories is that they may assess specific domains which fail to assess the broad nature of holistic and mechanistic thinking. Thus, the AHS and OMPI are the two best candidates to assess holistic and mechanistic thinking.
Due to the theoretical breadth of the measure and usage in previous research, the AHS is the preferred measure for the second study. The AHS appears to accord with the theory of Gare (1996) and McGilchrist (2009) more closely than the OMPI. In describing the principles of process philosophy, Gare (1996) describes a number of holistic principles. These involve being aware that the reality is constantly in flux; that all things are inherently interconnected; and that contextual factors must be considered in order to understand anything, as all things influence and are influenced by their environment. A lack of awareness of these factors (i.e., to view the world to comprise separate, unrelated parts which exist independently of embedded contexts) can result in a reification of certain things (i.e., money), resulting in utilitarian goal striving. According to McGilchrist (2009), holistic thinking involves a focus on broader contexts; an awareness that all things are inherently related; that life is dynamic and in constant flux rather than being static; and as a result, tends not to focus on instrumental outcomes to the same extent as mechanistic approaches. Peng and Nisbett (1999) suggest that Chinese dialectical thinking comprises three components; the principles of change, contradiction, and relationships. Change relates to the awareness that reality is in a constant flux. Contradiction pertains to the awareness that truth is often in ambiguous grey areas (i.e., the ‘middle way’) rather than definitive black and white answers. Finally, the principle of relationships refers to the awareness of all things as being inherently connected and that nothing is isolated and independent. Thus, all things influence, and are influenced by all other things. Emerging from a theoretically similar conceptualisation, the AHS (Choi et al., 2007) comprises four factors (locus of attention, causality, change, attitude toward contradiction). The OMPI however, was developed with a range of items covering areas of ontology, epistemology, conceptualisations of personhood, causality, change, and social and practical areas such as parenting, relationships and legal procedure (Johnson et al. 1988). Thus, it may be too broad and over-emphasise certain aspects of holistic/mechanistic thinking than others.
Therefore, the AHS may suffice as a better measure of holistic and mechanistic thinking than the OMPI. In addition, EFA and CFA analyses have only been conducted on the AHS (see Choi et al., 2007; Lechuga et al., 2010). Despite these results indicating that the AHS provided inadequate model fit, the OMPI did not undergo the same tests (see Johnson et al., 1988). Thus, there is no evidence of factorial validity for the OMPI, which provides further credence to using the AHS. To further substantiate the importance of mechanistic and holistic thinking, a range of convergent measures will be considered.
Chapter 16: Constructs to provide convergent validity with the assessment of holistic and mechanistic thinking

Ego development and self-actualization

Loevinger’s (1976, 1987) work on ego development suggests that from childhood into adolescence and then adulthood, there is an increasing movement towards greater levels of autonomy. That is, akin to Organismic Integration Theory (OIT; Deci & Ryan, 1985, 2000), higher ego stages are typified by internalising external norms and values and engaging with those which are personally valued and meaningful rather than conforming or adhering to external norms (Loevinger, 1976). For example, the conformist ego development stage which is generally evident in school-age children through to early-to-mid adulthood, involves a desire to be accepted by one’s social group, with behaviour judged on the basis of meeting subjective group norms. The following stage, conscientious-conformism, is marked by an adherence to norms and expectations, whilst also involving a greater awareness of individual differences. According to Loevinger (1976), this stage is generally not reached until at least 25 years of age. The three highest stages, individualistic, autonomous, and the much rarer integrated stage, all involve the use of a mature conscience to attain greater levels of autonomy free of guilt or self-condemnation (Loevinger, 1976). Thus, human development is a natural progression from external non-regulation to autonomous self-regulated behaviour (Deci & Ryan, 1985). Despite this, many individuals remain at the conformist stages of ego development (Loevinger, 1976, 1987). This may accord with the normative mechanistic orientation to the world in Western societies (Gare, 1996; McGilchrist, 2009). This utilitarian, instrumental, individualistic viewpoint emphasises the importance of tangible outcomes as measures of success or to define oneself, and may thus have resulted in the dominant pursuit of extrinsic aspirations as part of a consumer culture (see Dittmar, 2007; Kasser & Ryan, 1993, 1996). Importantly, a society in which the cultural norm is one of acquiring and
seeking external goals, such as material or financial wealth, is one in which individuals may be excessively controlled (Kasser & Ryan, 1993). Mechanistic thinking related to controlled regulation may result in one remaining at the conformist stage of ego development, thus stifling one’s ability to self-actualize.

According to Maslow (1968), all individuals strive to self-actualize; to become self-fulfilled and to realise one’s inner potential. Similarly, Rogers (1959) believed that there is an, “inherent tendency of the organism to develop all its capacities in ways which serve to maintain and serve the person” (pp. 196). Aristotle (1954) also suggested that part of the eudaimonic process of living is to realise the potential in those things which one is naturally skilled. Furthermore, Maslow (1968) suggests that to self-actualize is to ‘grow’ as a human being; to enhance and improve one’s internal skills and abilities. Self-actualization requires one to focus on and enhance characteristics within the self by transcending the constructed rules of society. Life is lived on one’s own terms, pursuing personal goals for internal reasons. Akin to OIT (Deci & Ryan, 1985; 2000), the highest level of mental functioning was considered by Maslow (1968) to involve internalizing external, socially-created demands so that they become autonomously regulated. Much like Deci and Ryan’s (1985, 2000) conceptualisation of autonomy, self-actualization does not infer selfishness (Maslow, 1968). Both do not involve a self-serving orientation to life, but an integration of external demands to maximise harmonious social integration.

Maslow’s (1968) conceptualisation of self-actualization is divided into a hierarchical structure with four subordinate levels of basic, innate human needs that need to be met before self-actualization can occur. The lowest level includes physiological needs, such as food, water and sleep. Above this are safety needs; security, order, avoidance of pain and protection. This level is succeeded by needs for belongingness and love. The fourth level of needs involves esteem and satisfaction with one’s achievements, including needs for self-
respect, unconditional acceptance and respect from others, and to be considered competent and effective. Once these subordinate needs have been mastered, self-actualization can occur. This is not a permanent state of being however, but similar to eudaimonia (Aristotle, 1954), a series of positive feelings derived from an ongoing engagement in self-fulfilling, growth-oriented experiences (Maslow, 1968). Holistic thinking may also be a pre-requisite for self-actualization.

Maslow (1968) suggested that a defining characteristic of self-actualized individuals is their ability to have transcended many of the norms, categories and values of society. Rather than adhering closely to these constructs, the self-actualised person is able to live on their own terms with a clear understanding of the true meaning of all aspects of life. Self-actualizers are thus able to consider, examine and understand all things based on their intrinsic nature and merit rather than seeing things through socially-created lenses or preconceived notions of good or bad. Such a viewpoint may be holistic in nature, as it may involve the ability to view things as being dynamic and changing based on current contexts, as well as a dialectical approach to understand that one’s pre-existing views can alter one’s conclusions (see Morris & Peng, 1999). Similarly, Loevinger’s (1976, 1987) work on ego development suggests that the highest stages of ego development accord with holistic thinking. That is, rather than classifying elements of life into rigid, pre-conceived categories, all things are understood and judged on the basis of current contexts. Similar to self-actualizers, Loevinger suggests that at the highest stage of ego development, individuals do not see things as being inherently good or bad, but that these distinctions only emerge through personal interpretation. Thus, for individuals in Western society, self-actualizing and attaining higher levels of ego development may be a result of transcending mechanistic orientations to life and instead viewing the world through the more complex, context-dependent lens of holistic thinking. In line with this, both Gare (1996) and McGilchrist
(2009), suggest that a greater balance which emphasises the importance of holistic in addition to mechanistic thinking is required for individual and societal wellbeing. The notion that the highest stages of ego development or self-actualization involve viewing the world in a way which does not pass judgement and accepts for things as they inherently are rather than socially-created conceptualisations of how they should be, also accords with the Buddhist concept of Nonattachment.

**Nonattachment**

Attachment is defined in Buddhist writings as the craving for, or clinging to transient things in life; for example, people, ideas, objects, or experiences (Asanga, 4th-5th century BCE/1950). Buddhism assumes a holistic perspective by suggesting that the nature of all things in life is that they are dynamic and ever-changing, and thus their loss is inevitable. Suffering emerges through the ignorance of, or unwillingness to accept this impermanence (Asanga, 4th-5th century BCE/1950; Sahdra, Shaver, & Brown, 2010). Nonattachment therefore involves an acceptance of the dynamic, transient nature of existence, as well as the belief that nothing is inherently good or bad; it is subjective human interpretation which provides things with value. This realisation is similar to that supposedly reached by those who have attained high levels of ego development (Loevinger, 1976) or who have self-actualized (Maslow, 1968). Furthermore, nonattachment involves seeing the nature of existence as an interconnected whole of which the self is part; there is no separate self which is attached to and defined by relationships with objects, ideas or values in the world. With complete unity, there is nothing to attach to (Asanga, 4th-5th century BCE/1950). Nonattachment however, is not a callous or nihilistic orientation to the world. For example, important people in one’s life are still loved and cherished, but with the inherent understanding and acceptance that relationships may change or deteriorate and will inevitably end through dissolution or death.
In contrast, Sahdra et al. (2010) defined attachment as the mental fixation or pressure to acquire, change, or possess ideas, images, or objects. Also typical of attachment is a sense of contingent wellbeing, defensiveness, jealousy, being possessive of other people or of objects, and anxiety about maintaining or changing aspects of life. Nonattachment was considered to involve a lack of fixation on concepts, the ability to recover quickly from negative events, an even-minded analysis of aspects of life, the ability to support the free choice of others, living with a sense of ease, and non-contingent wellbeing. As suggested by Sahdra et al., nonattachment is not restricted to those who partake in Buddhist practices such as meditation. It can result from wisdom gained by confronting difficult life experiences such as the death of loved ones, disruptions such as losing one’s job, and having one’s views and beliefs challenged and altered. Accordingly, Sahdra et al. have found nonattachment to increase with age.

Aspects of nonattachment can also be found in Western and Eastern philosophies and ways of thinking. Holistic Chinese dialectical thinking also emphasises that all things in life are constantly changing and that contradictions – the capacity for things to be simultaneously good and bad – can exist depending on one’s perspective (Morris & Peng, 1999; Nisbett, 2003). A Western example is that of process philosophy, and within it, the fallacy of misplaced concreteness (Whitehead, 1929, 1938). This fallacy is similar to the notion of attachment, in that both involve the reification of external, abstract, man-made concepts, beliefs and values, which are then situated as core, concrete components of life. The fallacy of misplaced concreteness and nonattachment also correspond with Fromm’s (1976/2005) notion of the Having and Being personas.
Having and Being personas

Using external items, objects, ideas or values to define oneself is a key component of what Fromm (1976/2005) referred to as the Having persona. In contrast, the Being persona represents an individual who defines oneself through fundamental personal characteristics. The preoccupation with obtaining material goods corresponds with the Having persona. The Being persona, supports notions of self-actualization (e.g., Maslow, 1968; Rogers, 1959) or eudaimonia (Aristotle, 1954). It involves reaching satisfaction with oneself for internal reasons rather than on the basis of impressing others with what one does or possesses. Therefore, Being is likely to involve focussing on intrinsic aspirations, whereas the Having persona is likely to accord with a greater level of importance placed on extrinsic aspirations (see Kasser & Ryan, 1993).

In accordance with the ability for those who are non-attached to deal with change (Sahdra et al., 2010), Fromm (1976/2005) suggested that individuals typifying the Being persona were the most capable of dealing with change as a result of conceptualising reality as an ever-changing flux in which all things are connected. In contrast, individuals with the Having persona were considered to be the least capable of dealing with change. For example, a Having individual’s sense of self may be predominantly derived from objects, their salary or level of wealth, their job, group membership or relationships with others, and belief in or adherence to certain ideas, beliefs, or values. If circumstances change so that this individual loses their job, they have not just lost their job, but a reified element comprising part of their sense of self. As Fromm suggested, for a Having individual, losing a material object may be felt as strongly as losing a limb. The Being persona however is resilient to these changes; one’s sense of self remains intact regardless of what changes may occur in one’s life. Therefore, it is expected to be the case that those who are more holistic are likely to be more non-attached, which is likely to involve placing a greater level of importance on intrinsic
rather than extrinsic aspirations, in accordance with the fallacy of misplaced concreteness (Gare, 1996; Whitehead, 1929, 1938) and the distinction between Being and Having personas (Fromm, 1976/2005). Accordingly, Sahdra et al. (2010) found that higher levels of nonattachment were associated with lower levels of materialism. In accordance with the assumption that those who are non-attached are able to live on their own terms rather than conforming to societal expectations and demands, higher NAS scores were also associated with greater levels of autonomous motivation and lower levels of impersonal (i.e., a fatalistic orientation with an external locus of control) motivation. Higher NAS scores were also associated with greater life satisfaction, eudemonic wellbeing, positive affect, empathic concern for others, and generosity; and lower levels of negative affect, depression, anxiety and stress.
Chapter 17: Conclusions and Hypotheses for Study 2

Based on the literature review, holistic and mechanistic thinking (Gare, 1996; McGilchrist, 2009) appear to comprise fundamental ways of looking at the world with convergent historical and cultural (e.g., Gare, 1996; McGilchrist, 2009; Nisbett, 2003), psychophysiological (McGilchrist, 2009), and cognitive (Buchtel & Norenzayan, 2009; Evans, 2008) support. Furthermore, holistic and mechanistic thinking appear to share much in common with research on individual and collective self-construals, intrinsic and extrinsic aspirations, self-actualization, and nonattachment. Importantly, holistic and mechanistic thinking may provide the answer to the main question which emerged from the results of Study 1. That is, to further understand the underlying perspective which may result in choosing to place importance on intrinsic rather than extrinsic aspirations, regardless of one’s orientation towards intellective rather than default processing (i.e., higher RIPO scores). Thus, the inclusion of the AHS in Study 2 aims to build on the findings from Study 1.

Based on the theory from Gare (1996) and McGilchrist (2009), mechanistic thinking has contributed to the development of a materialistic consumer culture. Furthermore, both authors suggest that scientific thinking for example, can be overly reductionist by being too mechanistic. That is, by ignoring broader contextual issues which a more holistic perspective would provide. McGilchrist (2009) in particular suggests that mechanistic thinking which is informed by holistic perspectives is likely to be the optimum way of conceptualising the world and thinking about certain issues or situations. Thus, it may be possible for complex thinking (i.e., typical of an orientation towards intellective processing (IP) to occur through either a mechanistic or holistic lens. In this sense, epistemic style and metaphysics may be distinct constructs. This argument is similar to the suggested revisions to System 1 and 2 thinking to consider Type 1 thinking as automatic, unconscious processing, whereas Type 2 processing involves effortful, reflective thinking that could be either mechanistic or holistic
in nature (Buchtel & Norenzayan, 2009; Evans, 2008). Thus, individuals may score highly on IP, which has much in common with Type 2 thinking, but view the world primarily from a mechanistic or holistic viewpoint. Despite this, research on ego development (Loevinger, 1976, 1987) and self-actualization (Maslow, 1968) suggests that the pinnacle of mental functioning involves holistic thinking. This provides an awareness of change and context, and an awareness of how all things are connected within the ‘big picture’, providing the ability to transcend rather than acquiesce to normative beliefs and values. As the tendency to unquestioningly accept the status quo is potentially more likely to occur with default processing (DP; Eigenberger et al., 2007), it may also be that holistic thinking is associated with higher levels of IP. That is, individuals who tend to question things may be more likely to transcend mechanistic norms and become holistic in Western cultures. It is therefore expected that higher levels of IP may be associated with higher levels of holistic thinking.

As shown in the hypothetical model (see Figure 3) it is expected that higher levels of holism (i.e., higher AHS scores) will be indirectly associated with higher levels of wellbeing. As found in Study 1, it is also expected that age and epistemic style will also be indirectly associated with wellbeing. Holism is expected to directly contribute to higher levels of nonattachment, as nonattachment is described as a holistic understanding of the nature of existence (Sahdra et al., 2010). As mechanistic thinking is associated with focussing on quantifiable outcomes and may have contributed to the development of a consumer culture (Gare, 1996; McGilchrist, 2009), lower AHS scores (i.e., higher levels of analytic/mechanistic thinking) are expected to be directly related to placing more importance on extrinsic than intrinsic aspirations and therefore indirectly associated with higher levels of materialism. Based on the holistic nature of self-actualization (Maslow, 1968), higher levels of holism are also expected to be directly associated with self-actualization. Thus, based on
the mediating influence of nonattachment, aspirations, and self-actualization, higher levels of holism are expected to be indirectly associated with increased wellbeing.

Figure 3. Hypothesised model in Study 2.
It is expected that there will be numerous direct paths from nonattachment. As higher levels of nonattachment have been associated with lower levels of materialism (Sahdra et al., 2010), it is expected that higher levels of nonattachment will be directly associated with lower REVO (i.e., placing comparatively more importance on intrinsic than extrinsic aspirations) and materialism scores. In accordance with the findings of Sahdra et al. (2010), higher levels of nonattachment are also expected to be directly associated with higher levels of autonomous regulation. It is also expected that higher levels of nonattachment will be directly associated with increased self-actualization.

In accordance with the findings of Study 1, higher RIPO scores (i.e., placing more importance on IP than DP) are expected to be associated with placing more importance on intrinsic than extrinsic aspirations. As mentioned earlier, higher levels of IP compared to DP do not necessarily infer that someone will have a more holistic perspective, however it is expected that those who are comparatively higher in IP may be more likely to transcend normative mechanistic viewpoints to develop a holistic way of thinking. As nonattachment appears to be a holistic way of understanding all aspects of life (Sahdra et al., 2010), it may be that higher RIPO scores are directly associated with higher levels of nonattachment. As a result of the mediating influence of aspirations, and the potential mediating influence of nonattachment, higher RIPO scores are expected to be indirectly associated with increased wellbeing, as found in Study 1.

In further accordance with the findings from Study 1, placing more importance on intrinsic compared to extrinsic aspirations should be directly associated with lower levels of materialism and higher levels of autonomous regulation. Furthermore, as found in Study 1, higher levels of autonomous regulation are expected to be directly associated with higher levels of self-esteem, and increased self-esteem is expected to be directly associated with higher levels of wellbeing (i.e., higher levels of vitality and life experiences, and lower levels
of depression). As self-actualization is the culmination of a certain way of living which emphasises enhancing and improving one’s skills and abilities, self-respect, unconditional acceptance from others, and feeling competent (Maslow, 1968), it is expected that higher levels of autonomous regulation and self-esteem, and reduced materialism, may contribute to higher levels of self-actualization.

Self-actualization is expected to be directly associated with higher levels of wellbeing. As mentioned earlier, self-actualization and ego development appear to have similar theoretical relationships to holistic thinking. Ego development will not be assessed due to the time consuming nature of the sentence completion task used to measure this construct (Loevinger, 1976, 1987), which was deemed impractical for an online survey considering the number of other measures included.

In relation to age, it is anticipated that older respondents will report lower RIPO scores (i.e., a greater focus on DP than IP) in accordance with findings from Study 1, but may also report higher scores on the AHS (i.e., higher levels of holism) and on nonattachment, as nonattachment can increase throughout one’s lifespan (Sahdra et al., 2010). Finally, in accordance with the results from Study 1, it is expected that older respondents will report placing comparatively more importance on intrinsic than extrinsic aspirations (i.e., lower REVO scores) and that age will also be directly associated with lower levels of materialism. Based on the mediating influence of nonattachment, aspirations, materialism, and subsequently regulation, self-esteem, and self-actualization, it is therefore expected that increased age will be indirectly associated with higher levels of wellbeing.
Chapter 18: Study 2 Method and Results

Method

Design

Similar to Study 1, and as shown in Figure 3, the second study assumes that there is a process from one’s way of looking at the world (i.e., holistic or analytic/mechanistic thinking, and epistemic style) which influences aspirations and associated outcomes such as regulation and self-esteem, which culminate in levels of wellbeing. One’s way of looking at the world however, may be influenced by age. In order to examine the various direct and indirect relationships between these variables which occur as part of this process, SEM was used.

Participants and procedure

After removing those from the original sample \( N = 327 \) who did not complete the entire survey, the sample consisted of 112 males and 119 females \( N = 231 \). Participants had been residing in Australia (80.90%) or the United States of America (11.70%) for at least 10 years. The remaining participants were from a range of Eastern European or Asian countries. It was decided to remove these European and Asian participants as the theory linking mechanistic thinking to the development of a consumer culture is based on Western cultural norms (Gare, 1996; McGilchrist, 2009). Furthermore, the work of Nisbett and colleagues (see Nisbett, 2003 for a review) suggests that there may be differences in levels of holism between Asian and Western respondents. As the influence of holism on aspirations and materialism may be different in Western countries compared to Eastern European or Asian countries, and that there were not enough participants from these countries to provide comparisons to Western respondents, it was decided to remove them from the analysis.

The sample thus comprised 100 males and 114 females \( N = 214 \) aged from 18 to 81 \((M = 31.93, SD = 15.06)\). A majority (71.10%) of participants were born in Australia, 10.30%
born in the United States of America, 3.70% were born in England, with the remainder of the sample from a wide range of European and South East Asian countries. At the time of completing the survey 87.40% of participants were residing in Australia and 12.60% in the United States of America. In addition, 81.80% of participants reporting living in their country of residence for their entire lives, with the remainder having lived there for at least 10 years. Participants (73%) primarily identified with Australian culture, followed by American (10.30%), English (3.80%), Chinese (2.80%), New Zealand (2.40%), and a range of other South East Asian and European cultures.

**Education.** In terms of education, respondents were current (23.80%) undergraduate or postgraduate (10.30%) students, or had completed undergraduate (15.90%) or postgraduate (10.70%) study. Respondents also reported having completed a vocational diploma (13.10%), a trade apprenticeship (2.80%), high school (21%), or had not completed high school (2.30%).

**Income.** In terms of income, 48.60% of the sample claimed to be earning between $0-$20,000 per annum, 17.80% between $20,001-$50,000, 15.90% earning between $50,001-$100,000, and 10.30% reported earning over $100,001 per year. A further 7.50% of respondents chose not to respond to this question.

**Procedure.**

The questionnaire package was offered online. Participants were recruited from those who completed the pen and paper questionnaire from the first study and provided consent to be contacted again (n = 11); snowball sampling through social networking websites and acquaintances of the researcher (n = 140); and a compulsory first year program in which first year undergraduate students participate in research for course credit, n = 80. For this program, students are able to access a website and select a study that they would like to
participate in for course credit. All studies are presented in alphabetical order. All participants were provided information about the study and a link to the survey. Students were able to freely access and complete the survey at a time and place of their convenience. Ethics approval was obtained from the Swinburne University Ethics Committee. A copy of the questionnaire is attached as Appendix B.

Materials

A range of measures from Study 1 were used again in Study 2. These included the aspiration index (Grouzet et al., 2005) assessing intrinsic (i.e., self-acceptance, affiliation, community feeling) and extrinsic (i.e., financial success, image, popularity, conformity) aspirations; the Material Values Scale (MVS; Richins, 2004); General Motivation Scale (GMS; Pelletier et al., 2011) to assess levels of controlled and autonomous regulation; the Rosenberg Self-esteem scale (RSES: Rosenberg, 1989), subjective vitality (Ryan & Frederick, 1997), life satisfaction (Diener et al., 1985) and the depression subscale of the DASS (Lovibond & Lovibond, 1995). All measures were found to be adequately reliable (see Table 2). A number of additional measures were also included in Study 2 and will be described next.
Table 2

*Reliability coefficients for measures being re-used in Study 2.*

<table>
<thead>
<tr>
<th>Measure</th>
<th>α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspiration Index (overall)</td>
<td>.90</td>
</tr>
<tr>
<td>Aspiration Index (intrinsic subscale)</td>
<td>.86</td>
</tr>
<tr>
<td>Aspiration Index (extrinsic subscale)</td>
<td>.92</td>
</tr>
<tr>
<td>Materialism</td>
<td>.87</td>
</tr>
<tr>
<td>General Motivation Scale</td>
<td>.84</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>.90</td>
</tr>
<tr>
<td>Vitality</td>
<td>.90</td>
</tr>
<tr>
<td>Satisfaction with life</td>
<td>.85</td>
</tr>
<tr>
<td>Depression</td>
<td>.96</td>
</tr>
</tbody>
</table>

**Additional measures.**

**Analytic and Holistic thinking.** The Analysis-Holism Scale (AHS; Choi et al., 2007) was used to measure the extent of holistic thinking. Similar to the theory of Gare (1996) and McGilchrist (2009), the AHS assumes that holistic individuals have a greater orientation towards viewing the whole rather than parts; explaining causal relationships as an interaction between actors and their environment rather than due to personal dispositions; viewing life as a constant state of change rather than static; and to opt for dialectical rather than logical ways of dealing with uncertainty (Choi et al., 2007).

The AHS consists of four facets with each comprising six items; causality (e.g., “Everything in the world is somehow related to each other”), attitude toward contradiction
(e.g., “It is more desirable to take the middle ground than go to extremes”), perception of change (e.g., “Every phenomenon in the world moves in predictable directions”), and locus of attention (e.g., “The whole, rather than the parts, should be considered in order to understand a phenomenon”). Each of the 24 items are rated on a seven-point scale (1 = Strongly Disagree; 7 = Strongly Agree). All items are summed to create an overall score, with higher scores ranging from 24 to 168, with higher scores indicating a greater level of holistic rather than analytic thinking. The reliability for the overall scale and each subscale as found by Choi et al. (2007) and in the current study are summarised in Table 3. The AHS was found to be similarly reliable overall in the current study, with the perception of change and locus of attention subscales performing more reliably in the current study than in the data reported by Choi et al. (2007).

Table 3

Reliability coefficients for the overall AHS scale and each facet as reported by Choi et al., (2007) and in Study 2.

<table>
<thead>
<tr>
<th></th>
<th>Choi et al. (2007)</th>
<th>Study 2 sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHS overall</td>
<td>.74</td>
<td>.75</td>
</tr>
<tr>
<td>Causality</td>
<td>.71</td>
<td>.81</td>
</tr>
<tr>
<td>Attitude toward contradiction</td>
<td>.69</td>
<td>.66</td>
</tr>
<tr>
<td>Perception of change</td>
<td>.58</td>
<td>.65</td>
</tr>
<tr>
<td>Locus of attention</td>
<td>.56</td>
<td>.75</td>
</tr>
</tbody>
</table>

The validity of the AHS was discussed previously. While there are some concerns with the factor structure and model fit (see Choi et al., 2007; Lechuga et al., 2010), the AHS does appear to perform in accordance with the theory of Nisbett (2003) in culturally-diverse
samples (Choi et al., 2007; Klein et al., 2009). The four factors of the AHS also appear to accord closely with the theory of Gare (1996) and McGilchrist (2009).

**Nonattachment.** The Nonattachment Scale (NAS; Sahdra et al., 2010) comprises 30 items (e.g., “I do not feel I need to escape or avoid bad experiences in my life”) measured on a six-point scale (1 = Disagree Strongly; 6 = Agree Strongly). Overall scale scores are created by summing and averaging all items, so that scores range from 1 to 6. Higher scores indicate greater levels of nonattachment. Sahdra et al. found the NAS to have excellent reliability across five samples (α = .92 to .93), good model fit according to a CFA and adequate test-retest reliability. In the current study, the NAS displayed excellent reliability, α = .93.

Sahdra et al. (2010) also found the NAS to be a valid measure. Higher levels of nonattachment were associated with lower levels of experiential avoidance (i.e., greater acceptance of current circumstances), greater mindfulness, acceptance, nonreactivity, self-compassion, and autonomous regulation. Nonattachment was also associated with higher levels of wellbeing, and lower levels of depression, stress, and anxiety. Furthermore, in accordance with theory, nonattachment was found to increase with age and there were no significant gender differences.

**Self-actualization.** To investigate the extent to which individuals have self-actualized, the self-actualization index (Jones & Crandall, 1986) was used. The scale consists of 15 items (e.g., “It is better to be yourself than to be popular”), measured on a 4 point scale (1 = Disagree; 4 = Agree). Scores from each item are summed, so that overall scale scores range from 1 to 60, with higher scores representing a greater degree of self-actualization. Jones and Crandall found that the scale displays modest reliability, α = .65. The scale was more reliable (α = .75) in the current study.
Jones and Crandall (1986) assessed the self-actualization scale with principal components analysis and found five factors which were deemed theoretically meaningful; autonomy, self-acceptance, acceptance and freedom of emotional expression; interpersonal trust, and the ability to deal with rather than avoid undesirable aspects of life. The scale displayed adequate test-retest reliability and correlated strongly with longer measures of self-actualization and self-esteem. The scale also correlated with higher scores on a range measures (e.g., personality, tolerance of ambiguity), which the authors felt provided adequate convergent and discriminant validity. This measure was also used in the development of the Subjective Vitality Scale (Ryan & Frederick, 1997) and in other studies examining aspirations and materialism (see Carver & Baird, 1998; Kasser & Ahuvia, 2002; Kasser & Ryan, 1993, 1996; Srivastava et al., 2001).

**Epistemic Preference Indicator-Revised.** The Epistemic Preference Indicator – Revised (EPI-R; Elphinstone, Farrugia, Critchley, & Eigenberger, 2014) which is a short form of the original EPI used in Study 1 (Eigenberger et al., 2007), was used to measure epistemic style. On a five-point scale (1 = Strongly Disagree; 5 = Strongly Agree), four items measure IP and four items measure DP. Subscale scores are created by separately summing IP and DP items, so that each subscale has a range of 5 to 20 with higher scores indicating a greater presence of either IP or DP. For the purpose of SEM analyses, a Relative Intellective Processing Orientation (RIPO) score was calculated by subtracting the sum of DP items from the sum of IP items. Scores thus range from -20 to 20, with higher scores indicating a greater comparative orientation towards IP than DP. Elphinstone et al. (2014) found the short IP (α = .73) and DP (α = .74) subscales to be adequately reliable. Reliability of these scales was found to be similar in the current study; IP, α = .78; DP, α = .69.
Results

Outliers and distribution of variables

The data was examined to ensure that there were no multivariate outliers, to examine the normality of distribution for each variable, and linearity in accordance with the assumptions required for SEM (see Tabachnick & Fidell, 2007). After removing participants from non-Western cultural backgrounds, three multivariate outliers were detected and removed on the basis of exceeding the critical Mahalanobis’ Distance score, $\chi^2(11) = 31.26, p < .001$.

Kolmogorov-Smirnov tests indicated that satisfaction with life and depression ($p < .001$), and vitality and self-esteem ($p < .01$) were negatively skewed. RIPO ($p < .001$), materialism and self-actualization ($p < .01$) and AHS score ($p < .05$) were significantly positively skewed. Shapiro-Wilk tests suggested that life satisfaction, depression, self-esteem (all $p < .001$) and vitality ($p < .01$) were significantly negatively skewed, whereas self-actualization ($p < .01$), and aspirations ($p < .05$) were significantly positively skewed.

An additional method of assessing skewness by dividing the skewness score by the standard error of skewness with a cut-off of ±3.29 ($p < .001$) indicated that only depression (9.23) was significantly positively skewed. Using the same method to calculate whether variables were normally kurtotic (±3.29, $p < .001$) only depression (5.60) was identified as not being normally distributed. Similar to Study 1, it appeared that a majority of respondents reported low levels of depression. Finally, scatterplots indicated that all variables displayed linearity.

Correlations

Bivariate correlations between all variables are presented in Table 4.
Table 4

*Correlations between all variables in Study 2.*

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Holistic/analytic thinking (AHS)</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>2. Epistemic style (RIPO)</td>
<td>.33***</td>
<td>-</td>
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<td>3. Nonattachment</td>
<td>.24***</td>
<td>.09</td>
<td>-</td>
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<td>4. Aspirations (REVO)</td>
<td>-.45***</td>
<td>-.40***</td>
<td>-.46***</td>
<td>-</td>
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<td>5. Regulation (GMS)</td>
<td>.31***</td>
<td>.34***</td>
<td>.45***</td>
<td>-.52***</td>
<td>-</td>
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<td>6. Self-esteem</td>
<td>.08</td>
<td>-.03</td>
<td>.63***</td>
<td>-.26**</td>
<td>.47***</td>
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<td>7. Materialism</td>
<td>-.36***</td>
<td>-.25***</td>
<td>-.57***</td>
<td>.63***</td>
<td>-.32***</td>
<td>-.26***</td>
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<tr>
<td>8. Self-Actualization</td>
<td>.18**</td>
<td>.16*</td>
<td>.63***</td>
<td>-.48***</td>
<td>.62***</td>
<td>.68***</td>
<td>-.46***</td>
<td>-</td>
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<td>9. Vitality</td>
<td>-.06</td>
<td>.02</td>
<td>.47***</td>
<td>-.17*</td>
<td>.37***</td>
<td>.59***</td>
<td>-.12</td>
<td>.39***</td>
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<td>10. Life satisfaction</td>
<td>.03</td>
<td>-.01</td>
<td>.51***</td>
<td>-.24**</td>
<td>.36***</td>
<td>.63***</td>
<td>-.25**</td>
<td>.44***</td>
<td>.60***</td>
<td>-</td>
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<tr>
<td>11. Depression</td>
<td>-.05</td>
<td>.08</td>
<td>-.55***</td>
<td>.20**</td>
<td>-.42***</td>
<td>-.74***</td>
<td>.16*</td>
<td>-.55***</td>
<td>-.57***</td>
<td>-.58***</td>
<td>-</td>
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<tr>
<td>12. Age</td>
<td>.15*</td>
<td>-.12</td>
<td>.38***</td>
<td>-.30***</td>
<td>.16*</td>
<td>.28***</td>
<td>-.32***</td>
<td>.36***</td>
<td>.09</td>
<td>.13</td>
<td>-.22**</td>
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*Note:*** p < .001, ** p < .01, * p < .05*
The results indicated that higher AHS scores (i.e., higher levels of holism) were, as expected, associated with a greater orientation towards IP than DP (i.e., higher RIPO scores) and higher levels of nonattachment. As expected, older people tended to report higher levels of holism. Higher AHS scores and higher RIPO scores were both associated with a greater orientation towards intrinsic than extrinsic aspirations (i.e., lower REVO scores), lower levels of materialism, and higher levels of autonomous regulation (i.e., higher GMS scores) and self-actualization. Both measures were also not significantly correlated with self-esteem, vitality, life satisfaction, depression, or income. Higher RIPO scores, but not AHS scores, were associated with lower incomes.

As expected, the results for nonattachment suggested that those who are more non-attached place comparatively less importance on extrinsic compared to intrinsic aspirations (e.g., lower REVO scores), reported lower levels of materialism, greater levels of autonomous regulation, higher self-esteem and self-actualization, in addition to higher levels of vitality, life satisfaction, and lower levels of depression. The results also indicated that older respondents reported higher levels of nonattachment.

In terms of aspirations, similar to Study 1, higher REVO scores (i.e., a greater comparative focus on extrinsic than intrinsic aspirations) were associated with higher levels of materialism, more controlled regulation (i.e., lower GMS scores), lower levels of self-esteem, self-actualization, vitality, and life satisfaction, and higher levels of depression. Older individuals were again found to report lower REVO scores, indicating a tendency to place more importance on intrinsic than extrinsic aspirations.

Higher levels of autonomous regulation (i.e., higher GMS scores) were associated with lower levels of materialism, in addition to higher levels of self-esteem, self-
actualization, vitality, and life satisfaction, and lower levels of depression. Older individuals and those with higher incomes also reported greater levels of autonomous regulation.

Higher scores on self-esteem and self-actualization were positively correlated with each other, and were also significantly correlated with lower levels of materialism, and higher scores on vitality and life satisfaction, lower levels of depression, and were both positively correlated with age and income. Similar to Study 1, higher scores on materialism were also associated with lower levels of life satisfaction and higher scores on depression. Finally, it was found that higher levels of vitality and life satisfaction were associated with lower levels of depression. Higher scores on life satisfaction, but not vitality, and lower scores on depression, were significantly correlated with age.

In addition to reporting higher levels of holism, as expected, older respondents also tended to place more importance on intrinsic than extrinsic aspirations (i.e., lower REVO scores). Contrary to expectation, and unlike the results from Study 1, age was not significantly correlated with RIPO scores. Older respondents also reported higher levels of autonomous regulation, self-esteem, and self-actualization, in addition to lower levels of materialism and depression.

**Structural Equation Modelling**

SEM using MPlus version 6 (Muthén & Muthén, 2010) was used to investigate the hypothesised model (see Figure 3 previously). Due to multivariate skewness (Mardia’s coefficient = 15.62), the Robust Maximum Likelihood estimation method was used to adjust the parameter estimate and chi-square statistics for non-normality.

With a sample of \( N = 211 \), and 47 free parameters, the case to parameter ratio was 4.49:1. This was below the minimum 5:1 ratio suggested by Bentler and Chou (1987). In
order to ensure an acceptable case to parameter ratio, and to ensure that the model was still investigating the indirect relationships of holism, epistemic style, and age with outcomes of self-actualization and wellbeing, three separate models were created. The first model (see Figure 4) involved removing self-actualization from the original hypothesised model. This was to ensure that the process through which age, epistemic style and holistic thinking may influence wellbeing as a result of nonattachment, aspirations, materialism, regulation, and self-esteem could be investigated. Using the same rationale, the second model (see Figure 5) involved removing wellbeing from the hypothesised model in Figure 3 in order to assess the indirect influence of age, epistemic style, and holism on self-actualization. The third model (see Figure 6) was used to examine the influence of both self-actualization and self-esteem on wellbeing, as neither aforementioned model included both self-actualization and self-esteem.
Figure 4. The revised hypothesised model in Study 2, after the removal of self-actualization.
Figure 5. The revised hypothesised model in Study 2, after the removal of wellbeing.

Figure 6. The third model in Study 2, examining the influence of self-esteem and self-actualization on wellbeing.
Model 1. With 41 parameters, the first model (see Figure 4) had a case to parameter ratio of 5.15:1, which was above the minimum acceptable 5:1 ratio suggested by Bentler and Chou (1987). The model was a poor fit with the data, $\chi^2(34) = 141.76, p < .001$, CFI = .88, TLI = .81, RMSEA = .12 (90% CI = .10-.14), SRMR = .10.

The results suggested that the direct paths from age to RIPO, age to materialism, and RIPO to nonattachment were not significant. It was decided to remove these paths from the model in order to enhance the case to parameter ratio. In addition, modification indices suggested that a direct path from nonattachment to self-esteem (MI = 53.80) would improve model fit. This path was theoretically justifiable, as Sahdra et al. (2010) consider nonattachment to involve a high level of acceptance of all aspects of life, including oneself.

After making these modifications, the revised model (with 39 parameters, and a 5.41:1 case to parameter ratio) was an improved fit with the data, $\chi^2(36) = 83.17, p < .001$, CFI = .95, TLI = .92, RMSEA = .08 (90% CI = .06-.10), SRMR = .06. While the model was not an ideal fit with the data (i.e., TLI < .95), there were no modification indices provided to suggest changes to the model. Thus, the model was deemed suitable for assessing the hypotheses. The model, with significant paths only, is shown in Figure 7.
Figure 7. The first model examining indirect effects to wellbeing with significant paths only

(*** p < .001, ** p < .01, * p < .05).
Direct Effects.

**Age.** Age significantly accounted for variance in AHS (3.42% variance explained), REVO (3.42% variance explained), and nonattachment (12.46% variance explained) scores. Thus, older respondents reported being more holistic, placing more importance on intrinsic than extrinsic aspirations, and having higher levels of nonattachment.

**Analytic-Holistic thinking.** AHS scores were directly associated with higher levels of nonattachment (3.53% of variance explained), and accounted for 6.40% of variance in lower REVO scores. Thus, as expected, respondents who tended to be more holistic in their thinking were more non-attached and placed higher levels of importance on intrinsic rather than extrinsic aspirations.

**Relative Intellective Processing Orientation.** Higher RIPO scores (i.e., a greater orientation towards IP than DP) were associated with less importance placed on extrinsic compared to intrinsic aspirations (i.e., lower REVO scores; \( r = -.31, p < .001, 9.49\%\) variance explained). The direct path from RIPO to nonattachment was not significant.

**Nonattachment.** All four paths from nonattachment were significant. Higher NAS scores were directly associated with greater importance placed on intrinsic rather than extrinsic aspirations (i.e., lower REVO scores; 8.76% of variance explained), lower levels of materialism (12.67% variance explained) higher levels of autonomous regulation (i.e., higher GMS scores; 7.08% variance explained), and higher self-esteem accounting for 27.25% of variance.

**Aspirations.** As expected, REVO scores significantly accounted for 21.16% of the variance in materialism, and 16.32% of the variance in regulation scores. Thus, placing more
importance on intrinsic than extrinsic aspirations was directly associated with lower levels of materialism and higher levels of autonomous regulation.

**General Motivation Scale.** Scores on the GMS accounted for 5.71% of the variance in self-esteem, indicating that higher levels of autonomous regulation were associated with greater self-esteem.

**Covariances.** Significant covariance was found between AHS and RIPO suggesting that the two variables shared 12.32% of variance. Thus, those who were more complex in their thinking (i.e., greater orientation towards IP than DP) also reported higher levels of holism.

**Indirect effects to wellbeing.**

**Indirect pathways from age.** There were six significant indirect paths from age to wellbeing. The first path suggested that increased age was directly associated with higher levels of nonattachment, leading to higher self-esteem and subsequently to higher levels of wellbeing. This indirect path accounted for 15.96% (indirect effect = .16, \( p < .001 \)) of the variance in wellbeing. The next path suggested that increased age was associated with higher levels of nonattachment, leading to higher levels of autonomous regulation, self-esteem, and subsequent wellbeing (indirect effect = .02, \( p < .05 \), 1.94% variance explained). An extension of both of these paths suggested that increased age lead to higher levels of nonattachment, resulting in a greater focus on intrinsic than extrinsic aspirations, higher levels of autonomous regulation, increased self-esteem, and higher wellbeing (indirect effect = .01, \( p < .05 \), .87% variance explained).

Two additional paths involved the influence of holistic thinking. First, increased age was directly associated with higher levels of holism, leading to higher levels of
nonattachment, self-esteem, and greater wellbeing. The next path suggested that increased age resulted in higher levels of holism, leading to placing more importance on intrinsic than extrinsic aspirations, higher levels of autonomous regulation, greater self-esteem, and increased wellbeing. These paths accounted for 1.57% (indirect effect = .02, \( p < .05 \)) and .39% (indirect effect = .004, \( p < .05 \)) of variance in wellbeing respectively.

The final indirect path suggested that increased age directly resulted in placing more importance on intrinsic than extrinsic aspirations, leading to higher levels of autonomous regulation, increased self-esteem, and greater wellbeing (indirect effect = .02, \( p < .01 \), 1.55% variance explained).

**Indirect pathways from analytic-holistic thinking.** There were three indirect paths from AHS scores to wellbeing. Higher levels of holism were directly associated with higher levels of nonattachment, leading to greater self-esteem and higher levels of wellbeing (indirect effect = .09, \( p < .01 \), 8.50% variance explained). Higher levels of holism leading to greater nonattachment also resulted in placing more importance on intrinsic than extrinsic aspirations, leading to higher levels of autonomous regulation, higher self-esteem, and greater wellbeing (indirect effect = .01, \( p < .05 \), .47% variance explained).

Finally, higher levels of holism were directly associated with placing more importance on intrinsic than extrinsic aspirations, leading to higher levels of autonomous regulation, greater self-esteem, and higher subsequent levels of wellbeing (indirect effect = .02, \( p < .01 \), 2.12% variance explained).

**Indirect pathway from relative intellective processing orientation.** A single significant indirect path suggested that higher RIPO scores (i.e., a greater orientation towards IP than DP) resulted in placing more importance on intrinsic than extrinsic aspirations,
leading to higher levels of autonomous regulation, self-esteem, and wellbeing (indirect effect $= .03, p < .01, 2.58\%$ variance explained).

**Indirect effects to materialism.**

As there was no significant relationship between materialism and wellbeing in the current model, there were separate indirect pathways from each of age, AHS, and RIPO scores to materialism that did not include wellbeing.

**Indirect paths from age.** There were six significant indirect paths from age to materialism. Increased age was directly associated with higher levels of nonattachment, leading to lower levels of materialism (indirect effect $= -.13, p < .001, 12.57\%$ variance explained). Increased age leading to higher levels of nonattachment also resulted in placing more importance on intrinsic than extrinsic aspirations which resulted in lower levels of materialism (indirect effect $= -.05, p < .001, 4.81\%$ variance explained).

Three paths involved the direct relationship between age and holism. Increased age was directly associated with higher levels of holism, leading to greater nonattachment and reduced wellbeing (indirect effect $= -.01, p < .05, 1.24\%$ variance explained). Increased age leading to higher levels of holism also resulted in placing more importance on intrinsic than extrinsic aspirations, resulting in lower levels of materialism (indirect effect $= -.02, p < .05, 2.15\%$ variance explained). Finally, increased age directly leading to higher levels of holism resulted in higher levels of nonattachment, higher levels of importance placed on intrinsic compared to extrinsic aspirations, and lower levels of materialism (indirect effect $= -.01, p < .05 , .47\%$ variance explained).
The sixth significant indirect path suggested that increased age was directly associated with placing more importance on intrinsic than extrinsic aspirations, leading to lower levels of materialism (indirect effect = -0.09, \( p < .01 \), 8.51% variance explained).

**Indirect paths from analytic-holistic thinking.** There were three significant indirect pathways from AHS scores to materialism. Higher levels of holism were associated with higher levels of nonattachment, leading to reduced materialism (indirect effect = -0.07, \( p < .01 \), 6.69% variance explained). Higher levels of holism were also directly associated with placing more importance on intrinsic than extrinsic aspirations, leading to lower levels of materialism (indirect effect = -0.12, \( p < .001 \), 11.64% variance explained). Finally, higher levels of holism were directly associated with higher levels of nonattachment, leading to placing more importance on intrinsic than extrinsic aspirations, and lower subsequent levels of materialism (indirect effect = -0.03, \( p < .01 \), 2.56% variance explained).

**Indirect path from epistemic style orientation.** Higher comparative levels of IP than DP (i.e., higher RIPO scores) were directly associated with placing more importance on intrinsic than extrinsic aspirations, leading to lower levels of materialism (indirect effect = -0.14, \( p < .001 \), 14.17% variance explained).

**Model 2.** The second model including self-actualization rather than self-esteem was modified on the basis of the findings from Model 1. For example, as the direct path from age to materialism was not significant, it was removed in Model 2. Additionally, the added path from nonattachment to self-esteem from Model 1 was included in Model 2. Furthermore, while a path from materialism to wellbeing was not included in Model 1 due to the results found from Study 1, a path from materialism to self-actualization was included as Maslow (1968) suggested that material goals should not be a central focus in life. It is expected that higher levels of materialism may result in lower levels of self-actualization.
With 35 distinct parameters (case to parameter ratio of 6.03:1), the model was an adequate fit with the data, $\chi^2(18) = 47.16, p < .001$, CFI = .96, TLI = .91, RMSEA = .09 (90% CI = .06-.12), SRMR = .05. No modification indices were provided to recommend changes to the model. The model is shown in Figure 8.

*Figure 8. Model 2 examining self-actualization, with significant paths only (***, $p < .001$, ** $p < .01$, * $p < .05$).*
**Direct effects.** A majority of the direct effects from Model 2 were identical to those found in Model 1. The direct paths from REVO scores and nonattachment to materialism were slightly different. Higher REVO scores were directly associated with higher levels of materialism, accounting for 22.47% of the variance. Higher levels of nonattachment were again found to be directly associated with lower levels of materialism, with 12.46% variance explained. The direct path from analytic-holistic thinking to self-actualization was not significant. In contrast, higher levels of nonattachment (1.64% variance explained), autonomous regulation (10.89% variance explained), and self-esteem (15.21% variance explained) were directly associated with higher levels of self-actualization. Higher levels of materialism were directly associated with reduced self-actualization accounting for 3.61% of variance.

**Indirect effects from age to self-actualization.** There were thirteen significant indirect paths from age to self-actualization. Eight of these paths included a direct path from increased age to higher levels of nonattachment. Increased age was directly associated with higher levels of nonattachment, which resulted in higher levels of self-actualization (indirect effect = .05, \( p < .05 \), 4.52% variance explained). A second path included age, nonattachment, and higher levels of self-esteem, with a third path including age, nonattachment, and lower levels of materialism. These paths were associated with higher levels of self-actualization, explaining 7.19% (\( r = .07, p < .001 \)) and 2.37% (indirect effect = .02, \( p < .01 \)) of variance respectively. A fourth path included age, nonattachment, higher levels of autonomous regulation, and higher subsequent levels (indirect effect = .03, \( p < .01 \), 3.10% variance explained) of self-actualization.

The fifth path suggested that increased age leads to higher levels of nonattachment, resulting in placing more importance on intrinsic than extrinsic aspirations, higher levels of autonomous regulation, and higher levels of self-actualization (indirect effect = .01, \( p < .01 \), 0.99% variance explained).
1.39% variance explained). The sixth path included age, nonattachment, placing more importance on intrinsic than extrinsic aspirations, lower levels of materialism, and higher levels of self-actualization (indirect effect = .01, \( p < .05 \), .94% variance explained). The seventh path included age, nonattachment, autonomous regulation, increased self-esteem, and higher levels of self-actualization (indirect effect = .01, \( p < .05 \), .88% variance explained). The eighth path suggested that increased age lead to higher levels of nonattachment, leading to in placing more importance on intrinsic than extrinsic aspirations, higher levels of autonomous regulation, higher self-esteem, and higher subsequent levels of self-actualization. This path accounted for .39% (indirect effect = .004, \( p < .05 \)) of the variance in self-actualization.

Three indirect paths to self-actualization included a direct relationship between age and aspirations. Increased age directly resulted in placing more importance on intrinsic than extrinsic aspirations, leading to higher levels of autonomous regulation and greater self-actualization (\( r = .02, \ p < .01 \), 2.47% variance explained). A second path included age, aspirations, lower levels of materialism, and higher self-actualization (indirect effect = .02, \( p < .05 \), 1.67% variance explained). The final path accounted for .70% (indirect effect = .01, \( p < .01 \)) of the variance in self-actualization. This path suggested that increased age leading to placing more importance on intrinsic than extrinsic aspirations resulted in higher levels of autonomous regulation, to higher levels of self-esteem, and higher levels of self-actualization.

The remaining two indirect pathways from age to self-actualization included direct paths from age to higher levels of holism. Increased age lead to higher levels of holism, resulting in placing more importance on intrinsic than extrinsic aspirations, higher levels of autonomous regulation, and greater self-actualization (indirect effect = .01, \( p < .05 \), .62% variance explained). The second path included age, higher levels of holism, greater
nonattachment, higher self-esteem, and higher subsequent levels of self-actualization (indirect effect = .01, \( p < .05 \), .71% variance explained).

**Indirect paths from analytic-holistic thinking to self-actualization.** Nine significant indirect paths from analytic-holistic thinking to self-actualization were found. Six of these paths included a direct relationship from higher levels of holistic thinking to higher levels of nonattachment. Higher levels of holism were found to lead to greater nonattachment, then to either lower levels of materialism, higher levels of autonomous regulation, or greater self-esteem, and then from each of those variables to increased self-actualization. The three indirect paths respectively accounted for 1.26% (indirect effect = .01, \( p < .05 \)), 1.65% (indirect effect = .02, \( p < .05 \)), and 3.83% (indirect effect = .04, \( p < .01 \)) of variance in self-actualization.

The next three paths included a direct path from higher levels of holism to higher levels of nonattachment and to placing more importance on intrinsic than extrinsic aspirations. From aspirations, the indirect paths resulted in increased self-actualization as a result of either higher levels of autonomous regulation (indirect effect = .01, \( p < .05 \), .74% variance explained), lower levels of materialism (indirect effect = .01, \( p < .05 \), .50% variance explained), or higher levels of autonomous regulation leading to increased self-esteem (indirect effect = .002, \( p < .05 \), .21% variance explained).

Higher levels of holistic thinking were also directly associated with placing more importance on intrinsic than extrinsic aspirations. From aspirations there were three indirect paths to self-actualization including either lower levels of materialism (indirect effect = .02, \( p < .05 \), 2.28% variance explained), higher levels of autonomous regulation (indirect effect = .03, \( p < .01 \), 3.37% variance explained), or higher levels of autonomous regulation to higher levels of self-esteem (indirect effect = .01, \( p < .01 \), .95% variance explained).
**Indirect paths from relative epistemic style orientation to self-actualization.**

Higher RIPO scores (i.e., an orientation towards IP rather than DP), were directly associated with placing more importance on intrinsic than extrinsic aspirations. One indirect path included RIPO, aspirations, lower levels of materialism, and greater self-actualization (indirect effect = .03, \( p < .01 \), 2.77% variance explained). The second indirect path included RIPO scores, aspirations, higher levels of autonomous regulation, and greater subsequent self-actualization (indirect effect = .04, \( p < .01 \), 4.11% variance explained). The final indirect path included higher levels of IP than DP, more importance placed on intrinsic than extrinsic aspirations, higher levels of autonomous regulation, greater self-esteem, and higher levels of self-actualization (indirect effect = .01, \( p < .01 \), 1.16% variance explained).

**Model 3.** The third model was used to assess the influence of self-esteem on self-actualization in accordance with the findings from Model 2, and the influence of both variables on wellbeing. With 14 free parameters (case to parameter ratio of 15.07:1), the model was a good fit with the data, \( \chi^2(4) = 11.51, p < .001, \) CFI = .99, TLI = .96, RMSEA = .09 (90% CI = .03-.16), SRMR = .03. The model is shown in Figure 9.

![Figure 9](image.png)

*Figure 9. Model 3 with significant paths only, investigating the influence of self-esteem and self-actualization on wellbeing (*** \( p < .001 \), ** \( p < .01 \), * \( p < .05 \)).*

In accordance with Model 1, higher levels of self-esteem were directly associated with increased wellbeing, accounting for 69.22% of variance. In accordance with Model 2,
higher levels of self-esteem were directly associated with higher levels of self-actualization, explaining 46.38% of variance. The direct path from self-actualization to wellbeing was not significant.
Chapter 19: Study 2 Discussion

The purpose of the second study was to examine the indirect effects of holistic and analytic (i.e., mechanistic) thinking, age, and epistemic style on wellbeing, based on the mediating influence of aspirations, materialism, nonattachment, regulation, self-esteem, and self-actualization. In particular, higher levels of holism, an orientation towards IP than DP, and potentially increased age, were expected to be indirectly associated with higher levels of wellbeing and self-actualization. Three models were created in order to ensure that there were enough participants to sufficiently analyse each model. The results of each model were generally in accordance with expectations. Higher levels of holistic thinking, increased age, and a greater epistemic orientation towards IP than DP were each indirectly associated with higher levels of wellbeing and self-actualization due to the mediating influence of nonattachment, intrinsic aspirations, autonomous regulation, and self-esteem, and for the model including self-actualization, reduced levels of materialism. Greater self-esteem, but not self-actualization, was found to contribute to higher levels of wellbeing.

The results of Models 1 and 2 indicated that a greater orientation towards IP than DP (i.e., higher RIPO scores) was significantly correlated with higher levels of holistic thinking. Age, as expected was directly associated with higher levels of holism, but contrary to findings from Study 1, was not significantly associated with RIPO scores. Thus, older respondents reported being more holistic in their thinking, but epistemic style was not significantly associated with age.

Increased age and higher levels of holism were both directly associated with higher levels of nonattachment. A direct path from RIPO to nonattachment was created to explore whether those who are higher in IP compared to DP may be more non-attached. The results indicated that nonattachment was not directly associated with epistemic style. As expected,
increased age, a greater epistemic orientation towards IP than DP, higher levels of holism and nonattachment, were each directly associated with placing more importance on intrinsic than extrinsic aspirations. Higher importance placed on intrinsic aspirations was, as expected on the basis of findings from Study 1, associated with lower levels of materialism and higher levels of controlled regulation. Contrary to the findings from Study 1 however, age was not directly associated with materialism. Due to the direct path from age to aspirations, increased age was indirectly associated with lower levels of materialism due to placing more importance on intrinsic than extrinsic aspirations.

In Models 1 and 2, higher levels of nonattachment were, as expected, directly associated with lower levels of materialism, in addition to higher levels of autonomous regulation. While not originally expected, the addition of a path from nonattachment to self-esteem indicated that higher levels of nonattachment were directly associated with increased self-esteem in Models 1 and 2. In accordance with expectations, in Model 2, higher levels of nonattachment were also directly associated with higher levels of self-actualization.

In both Models 1 and 2, higher levels of autonomous regulation were associated with increased self-esteem. In Model 2, increased autonomous regulation was directly associated with higher levels of self-actualization. Higher levels of materialism were not associated with wellbeing in Model 1, but directly contributed to lower levels of self-actualization in Model 2. In Study 1 it was found that materialism was indirectly associated with reduced wellbeing due to materialism contributing to reduced satisfaction of basic psychological needs and self-esteem. In both Studies 1 and 2, higher scores on materialism were significantly correlated with greater depression and reduced life satisfaction, and were not significantly correlated with vitality. Thus, consistent with previous research (Dittmar et al., 2011; Wright & Larsen, 1993 for reviews), materialism was associated with wellbeing constructs, but as found in
Studies 1 and 2, after accounting for the influence of aspirations, nonattachment, regulation, and self-esteem, materialism does not appear to be directly associated with wellbeing.

Finally, as expected, higher levels of self-esteem were directly associated with higher levels of wellbeing in Models 1 and 3, and higher levels of self-actualization in Model 2. Contrary to expectations, self-actualization was not significantly associated with wellbeing in Model 3. Thus, it appeared that the most important direct predictor of increased wellbeing was self-esteem, and that self-actualization may be distinct to wellbeing. An additional unexpected finding was that the direct path from holism to self-actualization was not significant. Higher levels of holism were however, indirectly associated with increased self-actualization as a result of holism being associated with nonattachment.

Overall, the results indicated that due to increased age and being more holistic, individuals were likely to be more non-attached, place more importance on intrinsic than extrinsic aspirations, be more autonomously regulated, and have greater self-esteem, resulting in higher levels of wellbeing and self-actualization. Similar to Study 1, higher levels of IP than DP were associated with placing more importance on intrinsic than extrinsic aspirations which led to increased autonomous regulation and greater self-esteem, leading to increased wellbeing and self-actualization. Reduced levels of materialism occurring as an indirect result of increased age, greater holism, or an orientation towards IP rather than DP were also associated with greater self-actualization, but not wellbeing.

**Considerations for Study 3**

A majority of the findings from the second study were in accordance with theory. Importantly, results pertaining to analytic-holistic thinking were in line with theory from Gare (1996) and McGilchrist (2009) who suggested that mechanistic thinking is likely to result in a greater focus on extrinsic, materialistic goals in life. Thus, it appears that it is
worthwhile to continue investigating the influence of holistic and mechanistic thinking on aspirations and materialism. In particular, it may be worthwhile attempting to replicate these results with the OMPI (Johnson et al., 1988). This will help to clarify whether holistic thinking is legitimately associated with placing more importance on intrinsic than extrinsic aspirations, for example, and that it was not an artefact of using the AHS (Choi et al., 2007). That is, as there are concerns regarding the validity and factor structure of the AHS (see results from Choi et al., 2007; Lechuga et al., 2010), there is a possibility that the obtained relationships do not actually exist in the real world, but simply due to concerns with measurement. For example, as suggested earlier, certain items may assess a desire to avoid conflict rather than a ‘middle way’ approach whereby differing perspectives may be considered equally valid depending on context (Peng & Nisbett, 1999). Thus, higher scores may not actually indicate holism, but rather an aversion to conflict or disagreement with others. It is also worthwhile attempting to replicate the results as the sample in Study 2 was modest, resulting in the models having case to parameter ratios below the recommended 10:1 ratio (see Bollen, 1989; Jackson, 2003).

In order to further understand the reasons why individuals may choose to place more importance on extrinsic than intrinsic aspirations, the third study will attempt to understand the means through which holistic and analytic thinking develop. For example, it has been suggested that low self-esteem may lead to being more materialistic (e.g., Banerjee & Dittmar, 2008; Chaplin & John, 2007; Fenichel, 1938; Fournier & Richins, 1991; Heilbroner, 1956; Kasser & Ryan, 1993, 1996; Kasser et al., 2014). The results from the current study however, suggest that placing more importance on extrinsic than intrinsic aspirations may directly and indirectly lead to low self-esteem via controlled regulation, rather than self-esteem influencing which aspirations are deemed important. The current study has also indicated that nonattachment, which has hitherto not been investigated in research on
aspirations, may predict which aspirations people are likely to place importance on. Nonattachment was directly associated with lower levels of materialism, and increased autonomous regulation, self-esteem, and self-actualization. Thus, nonattachment, as a general orientation towards life in general, appears to be directly and indirectly associated with aspects of life such as intrinsic aspirations, autonomous regulation and high self-esteem which contribute to living well (e.g., Aristotle, 1954; Deci & Ryan, 1985, 2000; Maslow, 1968).

Despite the apparent importance of nonattachment, the models indicated that higher levels of holism contributed to higher levels of nonattachment. For this reason, it is important to investigate holistic thinking further. In particular, to identify how holistic thinking may develop. The findings from Models 1 and 2 indicated that holism may be more common in older people. This could be due to having more life experience which lead to the understanding of existence as a dynamic, interconnected wholeness (e.g., Sahdra et al., 2010). Holism may also develop due to generational changes. For example, Gare (1996) and McGilchrist (2009) suggest that materialism may be increasing due to a greater societal emphasis on mechanistic rather than holistic perspectives. This accords with the suggested of Twenge et al. (2010) that there has been a generational increase in psychopathology due to an increase in materialism (see also Dittmar, 2007; Seligman, 1990). Despite this, and as the results from Study 2 indicated, not all people are mechanistic or materialistic. It may be that other factors such as parenting styles are important. Certain parenting styles may lead to a greater adoption of mechanistic or holistic perspectives, which then contribute to aspirations, regulation, self-esteem, and wellbeing.
Chapter 20: Study 3 Introduction

Gare (1996) and McGilchrist (2009) suggest that holistic and mechanistic thinking are fundamental, metaphysical views which influence how individuals understand all aspects of life. The work of Nisbett and colleagues (see Nisbett, 2003 for a review) and Dweck and colleagues (see Dweck, 1999; Dweck et al., 1995 for a review), suggest that there are differences between cultures in these underlying lay theories or metaphysics. There is also evidence of within-culture differences in levels of holistic and mechanistic thinking (Choi et al., 2007; Johnson et al., 1988) and in levels of field dependence or interdependence (e.g., Adevai, et al., 1970; Berry, 1967; Dershowitz, 1971; Witkin & Berry, 1975). Thus, certain influences within-cultures may influence one’s metaphysics or worldview. Thus, if mechanism and holism are fundamental viewpoints between and within cultures, they may exist partly as a result of one’s early experiences in life. Parenting styles may therefore be associated with differing levels of mechanistic and holistic thinking within cultures. Thus, the aim of Study 3 is to investigate the influence of parenting styles on the development of holistic and mechanistic thinking, in addition to examining the efficacy of the OMPI in addition to the AHS.

Parenting styles

Deci and Ryan (1985) have suggested that different parenting styles, such as authoritative, authoritarian, and permissive parenting identified by Baumrind (1966, 1971, 1972) are likely to influence regulation.

Authoritative. Authoritative parenting values the development of autonomous self-will and disciplined conformity (Baumrind, 1966). Responsible control and limit setting equal to a child’s capability in a warm and nurturing environment results in children who are mature, confident and socially responsible (Baumrind, 1966, 1972) who pursue, intrinsic,
self-motivated outcomes (Lindsey & Mize, 2000). This is likely to result in secure attachment, in which individuals have a positive view of self and of others (Bartholomew & Horowitz, 1991). Much like the findings suggesting that people seek out and thrive under optimal challenges (i.e., competence; Deci & Ryan, 1985, 2000), authoritative parenting results in a mature self due to mirroring appropriate behaviours and providing children with optimal levels of frustration (Watson, Little & Biderman, 1992).

**Authoritarian.** Authoritarian parents are cold, rejecting and concerned primarily with their own needs (Baumrind, 1966). Thus, they tend to be rigid, harsh, and demanding, seeking to have the child conform to parental views rather than accounting for the child’s needs or desires. Authoritarian parenting tends to result in children who are conformist and obedient (Lamborn, Mounts, Steinberg, & Dornbusch, 1991), anxious, have low self-esteem, lack self-reliance and subsequently develop a negative self-view (Baumrind, 1971).

**Permissive.** Permissive parenting is defined by over-indulgent and over-encouraging of the child in which there are few, if any, rules and regulations. Permissive parenting tends to result in immaturity, a lack of motivation, and impulsivity (Baumrind, 1966).

**Parenting styles and regulation**

Deci and Ryan (1985, 2000) have suggested that authoritative parenting is likely to result in autonomous regulation due to its emphasis on warmth, consistent limit setting, and being supportive of each child’s self-expression. Based on the regulatory process described within OIT (Deci & Ryan, 1985, 2000), it is expected that authoritarian parenting (i.e., submitting or acquiescing to external demands to avoid punishment or meet the expectations of others; Baumrind, 1971) should be associated with controlled regulation. In addition, permissive parenting, which provides few rules and reasons for motivation (Baumrind, 1966) may be associated with amotivated regulation (see Deci & Ryan, 1985, 2000).
Authoritative parenting has been associated with the development of greater self-regulation than either authoritarian or permissive parenting (Patock-Peckham, Cheong, Balhorn, & Negoshi, 2001). In specific domains such as education, autonomy supportive parenting (similar to authoritative parenting) yields higher levels of self-regulation in comparison to controlling parenting (similar to authoritarian parenting; see Grolnick, Deci, & Ryan, 1997 for a review). Parents who are autonomy granting tend to have children who have internalized external demands and are more autonomous in school-related activities (Grolnick & Ryan, 1989; Grolnick et al., 1991), and are more autonomous and likely to succeed in university (Vallerand & Bissonnette, 1992). A meta-analysis of preschool children by Karreman, van Tuijl, van Aken, and Dekovic (2006) found that positive parental control was associated with higher levels of self-regulation than negative parental control. Maternal permissiveness has also been found to be associated with lower levels of academic self-regulation (Abar, Carter, & Winsler, 2009). Boon (2007) found in an Australian sample that adolescents who rated their parents as warm and involved (i.e., authoritative) achieved more academic success than students who rated their parents as strict and highly supervisory (i.e., authoritarian). In terms of general life motivation, Keller (2008) found that critical, punitive parenting (i.e., authoritarian) was associated with feeling that one ought to uphold duties and obligations (i.e., controlled regulation). Conversely, a supportive, responsive parenting style (i.e., authoritative) was associated with a general focus on attaining one’s ideal self through personal growth and nurturance (i.e., autonomous regulation). Keller found no relationship between permissive parenting and one’s focus in life.

Autonomy is ultimately about finding importance or identifying with a particular external demand, rule, or norm (Deci & Ryan, 1985, 2000; Ryan, 1995). SDT suggests that all people, regardless of culture, have basic psychological needs for autonomy, competence, and relatedness with others. In addition, while culture may influence the nature of salient
external demands, these demands can be internalised and autonomously regulated regardless of culture. This has been found in diverse samples comprising participants from a range of countries including the United States, Canada, Brazil, South Korea, Russia, and Turkey (e.g., Chirkov, Ryan, Kim, & Kaplan, 2003; Chirkov, Ryan, & Willness, 2005; Sheldon et al., 2004). Thus, regardless of one’s cultural norms, providing that one’s parents are authoritative, a sense of autonomy may eventuate. Accordingly, cross-cultural research has indicated that outcomes of parenting styles are similar. For example, authoritarian parenting has been found to be associated with lower levels of academic achievement in Australian, American, and Chinese samples (Leung, Lay, & Lam, 1998). In addition, authoritative parenting has also been associated with better psychological and psychosocial health in four (i.e., Caucasian, Hispanic, African, and Asian) American ethnic groups (Steinberg, Mounts, Lamborn, & Dornbusch, 1991). Chirkov and Ryan (2001) also found that higher levels of autonomy support were associated with increased levels of wellbeing in American and Russian samples.

**Parenting styles and metaphysics**

There are two arguments to substantiate the link between holistic and mechanistic thinking and parenting styles. First, in addition to the aforementioned research which suggests that authoritative parenting is associated with autonomous regulation (e.g., Grolnick et al., 1997; Grolnick & Ryan, 1989; Patock-Peckham et al., 2001; Vallerand & Bissonnette, 1992) the results of Study 2 suggested that higher levels of holistic thinking were associated with increased levels of autonomous regulation. Therefore, it may be the case that parenting styles influence regulation as a result of their effect on the development of holistic or mechanistic thinking. That is, authoritative parenting may leads to higher levels of holistic thinking, which subsequently results in autonomous rather than controlled regulation. Thus, in addition to providing situational autonomy in domains such as education (Grolnick &
Ryan, 1989), authoritative parenting may provide the capacity for children to have the ability to be generally autonomous in life (e.g., Patock-Peckham et al., 2001).

Secondly, Gare (1996) and McGilchrist (2009) suggest that in contemporary Western civilisation, mechanistic thinking defines normative pursuits such as materialism. Mechanistic thinking thus provides the ‘normal’ or ‘expected’ metaphysics or worldview that is typical of living a ‘good life’. Similarly, the work of Nisbett and colleagues (see Nisbett, 2003 for a review) suggests that simply being raised in either Western or Eastern societies can influence the respective development of analytic (i.e., mechanistic) or holistic thinking. Similar cultural differences have been found for entity and incremental theorists (see Dweck, 1999; Dweck et al., 1995). In this case, authoritative parenting provides two means through which holistic thinking may be developed.

First, Deci and Ryan (1985, 2000) suggest that relatedness provides the secure base through which individuals can explore the world, with confidence that others will be supportive if required. The warm, nurturing environment created by authoritative parenting (Baumrind, 1966) may provide the conditions for one to seek out holistic perspectives and to question dominant mechanistic norms. Furthermore, by encouraging exploration and questioning of the world, authoritative parenting may provide the means through which one questions mechanistic norms. This accords with the notion that holistic perspectives develop due to life experience (e.g., Loevinger, 1976, 1987; Maslow, 1968; Sahdra et al., 2010). In addition, rather than punitive punishment, authoritative parenting often enforces rules by explaining to a child why they child have broken the rules, how breaking the rules affects others, and why the rules exist (Baumrind, 1966). This process may also emphasise interconnectedness and an awareness of how one’s actions affect the world. This may enhance one’s ability to understand the ‘big picture’, resulting in higher levels of holistic thinking. In contrast, authoritarian parenting which emphasises acquiescence to the status quo
and an unquestioning respect for authority may be the parenting style that enables the continuation of mechanistic thinking by providing no alternative perspectives, or by discouraging one from questioning the current conceptualisations of what is ‘normal’. Thus, there may be little opportunity to transcend the mechanistic norms which define contemporary Western society (Gare, 1996; McGilchrist, 2009).

**Measurement of holistic and mechanistic thinking**

As mentioned in the Discussion from Study 2, the OMPI (Johnson et al., 1988) in addition to the AHS (Choi et al., 2007), will be used. This is to further indicate that holistic and mechanistic thinking are important constructs in relation to understanding the process through which wellbeing emerges as a result of the aspirations one places importance on in life, and the subsequent influence on regulation and concepts such as self-esteem. In addition, the usage of the OMPI will indicate whether the results from Study 2 are due to the genuine influence of holistic and mechanistic perspectives, or whether they may have occurred due to culturally biased items within the AHS. Despite this, there are practical and theoretical problems with a number of items from the OMPI. Thus, an edited version of the OMPI may provide a more accurate measure of holistic and mechanistic thinking.

**Theoretical concerns with the measurement of holistic and mechanistic thinking.**

A potential benefit of using the OMPI is that the forced-choice response format may be a more accurate method of measuring holistic and mechanistic thinking. Choi et al. (2007) expressed consternation as to whether analysis/mechanism and holism is a bipolar construct measured along a single continuum, or exists as two independent dimensions that coexist within an individual.
In the AHS, Choi et al. decided to assess analytic-holistic thinking as a bipolar construct. The view of holism and mechanism as independent dimensions however, coincides with McGilchrist (2009) who argues that holistic and mechanistic thinking are competing yet complementary differences in how the right and left hemispheres of the brain interpret reality. Furthermore, Nisbett et al. (2001; see also Nisbett, 2003) also suggest that all people are equipped with both ways of thinking but one comes to dominate based on cultural influence. Thus, it is theoretically unlikely that someone could be simultaneously holistic and mechanistic in making a decision or dealing with a certain situation. For example, it is unlikely that one could observe an argument and simultaneously seek to find a ‘middle way’ that embraces subjectivity and contradiction, whilst also demanding to find an absolute, definitive right or wrong answer. Thus, the bipolar construct response format of the AHS suggests that people are able to situate themselves along a continuum, where someone can be neither holistic nor analytic (i.e., mechanistic) in a given situation. The OMPI may have a better response format as each item includes a mechanistic and an organismic (i.e., holistic) option, of which respondents are required to choose one (Johnson et al., 1988). These dichotomous, forced-choice scores are then compiled into an overall score. The OMPI may thus delineating between mechanistic and holistic thinking at an absolute level for each item, but based on the number of holistic responses chosen, provide a spectrum of how holistic respondents are. This provides a similar overall spectrum score as the AHS, but avoids the potential problem of respondents being neither holistic nor mechanistic on any particular item. A close examination of the OMPI however, indicated that the removal of some items may improve the theoretical validity of the measure.

It was previously mentioned that the OMPI may not be as suitable a measure of holistic and mechanistic thinking as the AHS. Whereas the AHS assesses four factors (Choi et al., 2007) which accord with the theory of Gare (1996) and McGilchrist (2009), the OMPI
assesses a range of ontological and epistemological areas, in addition to conceptualisations of personhood, causality, change, and social and practical domains such as parenting, relationships and legal procedure (Johnson et al., 1988). Thus, the OMPI may lack the specificity of the AHS, or include items which are indicative of the authors’ bias on certain issues. Accordingly, a number of items were identified as not according with holism or mechanism as described by Gare (1996) and McGilchrist (2009), or the theory of root metaphors and world hypotheses (Pepper, 1942). Two main considerations were used in examining the theoretical content of each item. First, whether the item accurately measured holism or organicism, and secondly, whether the items may fit into the factors described by Gare (1996), McGilchrist (2009) and Peng and Nisbett (1999). An examination of the OMPI indicated that 14 items may be theoretically flawed. It was decided to remove each of the flawed OMPI response sets, which are discussed next.

**Theoretical assessment of items comprising the OMPI.** The first item comprises the responses, “Organisms change by forces from outside themselves” (mechanistic) and “Organisms can change themselves” (organismic). The concern with these responses is that organisms can physically change from outside forces (e.g., heat, radiation), or mentally change as a result of external influence (e.g., education). The holistic/organismic response in this case accords with a mechanistic belief that individuals can change regardless of contextual or environmental factors. Thus, genuinely organicistic respondents may be unfairly categorised as being mechanistic.

The second item comprised the holistic response, “A good judge is not objective and knows it” and the mechanistic response, “A good judge is purely objective”. This item appears to measure the extent to which one believes that knowledge or interpretation is influenced by external, contextual factors. As Gare (1996) suggests, people influence and are influenced by their environments. Despite this, the responses may not measure what was
intended. First, the term ‘judge’ could be interpreted as a legal judge, or as the ability to judge things in general (e.g., judging the character of another person). Second, even a judge who is knowingly biased or racist, for example, may still be a poor judge despite an awareness of their shortcomings.

The third item (“Great discoveries come from scientific imagination” [holistic]; “Great discoveries come from scientific experimentation” [mechanistic]), was also deemed to be flawed. The responses may distinguish between those who have knowledge of the scientific process compared to those who do not, rather than levels of holistic or mechanistic thinking. For example, someone who is not familiar with scientific fields and is unsure how research is conducted may believe that experimentation is the most important factor in making a scientific discovery. In addition, both responses may be equally viable for some respondents. For example, new ideas (imagination) which are scientifically tested (experimentation) can lead to great discoveries. Gare (1996) and McGilchrist (2009) suggest that mechanistic thinking in scientific research can lead to overly reductive findings which do not consider broader contextual factors. Such a view suggests that mechanism accords with a focus more on findings arising from experimentation than a focus on theory. This does not presuppose however, that experimentation is devoid of holistic considerations. Due to the different ways in which the responses may be interpreted by different people, it was decide to remove the item. Similar concerns were identified for the fourth (“Progress in science occurs when there is a new way of looking at events” [holistic]; “Progress in science occurs when an important observation is made” [mechanistic]) and fifth (“Our knowledge is limited by our imagination” [holistic]; “Our knowledge is limited by our observations” [mechanistic]) items. For the responses within both items, finding new ways of looking at events, or the way in which we choose to observe things, may comprise holistic considerations.
The sixth item comprises the holistic response, “A business executive needs time for creative thinking” and the mechanistic response, “A business executive needs time to analyse the facts”. Similar to the previous items, it is possible that both responses may not delineate well between holistic and mechanistic thinkers. While the emphasis on analysis may infer analytic thinking (see Nisbett, 2003 for a review) which is similar to mechanistic thinking, creative thinking is not necessarily the sole domain of holism. For example, McGilchrist (2009) suggests that logic or creativity can be either holistic or mechanistic in nature. Furthermore, at a practical level, it may be that business executives are required to analyse information, whereas other people in the organisation are employed to think creatively. Thus, there are a number of considerations which may influence responses beyond underlying levels of mechanistic or holistic thinking.

Item seven comprised the holistic response “Before making a big decision, I like to sleep on it”, and the mechanistic response, “Before making a big decision, I like to get all of the information”. It is unclear how ‘sleeping on it’ may be holistic. In addition, holistic Asian respondents tend to believe more information is useful in understanding a murder case than more analytic/mechanistic American respondents (Morris et al., 1995; Morris & Peng, 1994). Thus, a characteristic of holistic people may be to seek out a wide range of information prior to making decisions or passing judgement. This item may therefore unfairly categorise holistic respondents as being mechanistic.

The eighth item included the holistic response, “A criminal has a function in society” and the mechanistic response, “A criminal is just a burden to society”. In this case, it is unclear what function a criminal may provide to society, or the exact definition of the term ‘criminal’. For example, a murderer or thief may be considered a burden on society by many. Conversely, a protestor who attains a criminal record after being charged with civil
disobedience could be considered by some to have been performing an important function in society.

The ninth item comprised, “Divorce is often a phase in each partner’s growth” (holistic) and, “Divorce is usually the result of incompatible personalities” (mechanistic). Either answer may be applicable for a holistic individual. For example, divorce may be viewed as being the result of incompatible personalities emerging as a result of the changes which occur due to personal growth over time. In addition, the interpretation of each response may be influenced by variability in personal experience.

The tenth item which was deemed to comprise poor response content comprised, “War can be understood by examining what purpose it served” (holistic) and “War can be understood by examining its causes” (mechanistic). To examine the causes of conflict may involve holistic principles, such as assessing broad contextual factors, relationships between various nations, and changing, evolving political factions. As Gare (1996) and McGilchrist (2009) suggest, mechanism can lead to a focus on utilitarian outcomes. Thus, examining the purpose served by war may be a mechanistic rather than holistic consideration.

Item eleven comprised the holistic response, “I can change things in my family just by being who I am”, and the mechanistic response, “I can change things in my family only by planned action”. These items may also be influenced by personal or situational factors. For example, if someone is highly introverted, or from an abusive, domineering family, it may be unlikely that they could change their family by being who they are. In such cases, planned action may be the most feasible method of creating change. In contrast, a more assertive person may feel that they are able to change things just by being who they are. Therefore, responses to this item may be influenced by personality or situational factors rather than levels of mechanistic or holistic thinking.
Similar issues were evident with the responses comprising the twelfth item. The holistic (“To resolve a family dispute, it is important how we look at the facts”) and mechanistic (“To resolve a family dispute, it is important to discover all the facts”) responses may also be influenced by situational demands. The first issue is that there are numerous forms of family conflict. A dispute over who needs to complete chores is different to a dispute over someone having an extramarital affair. The type of dispute that an individual thinks of when responding may influence their decision to choose either response. In addition, similar to the research which suggests that holistic Asians consider more evidence in hypothetical murder cases than analytic Americans (Morris et al., 1995; Morris & Peng, 1994), it may be that discovering all of the facts is as typical of holistic thinkers as the awareness of how one’s perspective can influence interpretation of the facts. Thus, both responses may appeal equally to holistic thinkers.

The thirteenth item comprised, “Facts are more useful than a good idea” (mechanistic) and “Facts are less useful than a good idea” (holistic). The mechanistic response pertains to a desire to engage with factual information. As suggested by McGilchrist (2009), analysis or creativity can be either mechanistic or holistic. In addition, the emphasis on the importance of good ideas or factual information may be more representative of IP and DP rather than holistic and mechanistic thinking. As Eigenberger et al. (2007) suggest, IP reflects effortful, elaborative thinking whereas DP tends to involve effortless, expedient thinking. Thus, a belief in the benefit of good ideas may be appealing for IP individuals, whereas those with a tendency towards DP may prefer to expediently accept what is perceived to be factual information. Despite this, Peng and Nisbett (1999) suggest that analytic thinking (i.e., mechanism) may involve a tendency to desire definitive black and white answers rather than utilising a dialectical, ‘middle way’ approach. Thus, a mechanistic individual may prefer facts rather than good ideas. The persistent concern however, in line with the suggestion of
Gare (1996) and McGilchrist (2009), is that holism is an underlying ontological perspective, not an epistemic preference for certain analytic approaches. Thus, while Study 2 indicated that higher levels of holism were associated with IP rather than DP, items assessing epistemic style should not be included in a measure of underlying ontological perspectives. For this reason, a fourteenth item was identified; “We learn by carefully examining individual facts” (mechanistic) and “We learn by finding order in an array of facts” (holistic). These items may not be theoretically consistent with the measurement of holistic and mechanistic thinking. Examining individual or an array of facts may be context dependent, and may occur through either a holistic or mechanistic perspective.

In addition, a previous concern with the OMPI is that while the AHS comprises four factors (locus of attention, causality, change, attitude toward contradiction; Choi et al., 2007) which accord with the theory of holistic and mechanistic thinking from Gare (1996) and McGilchrist (2009), the OMPI measures a wide range of philosophical and practical domains (Johnson et al., 1988). These domains may not provide equal measurement of the various aspects comprising mechanistic and holistic thinking. Therefore, the OMPI items which were deemed to be theoretically adequate were examined and placed into theoretically meaningful factors.

Based on the work of Nisbett and colleagues (see Nisbett, 2003 for a review), and Gare (1996) and McGilchrist (2009), there appear to be three theoretical dimensions underlying mechanistic and holistic thinking. These are similar to those evident within Confucianism (Morris & Peng, 1994); change (i.e., reality exists as an ever-changing state of flux), relativism (i.e., there is rarely absolute truth but subjective interpretation), and that everything in life is inherently connected and defined by context. As shown in Table 5, the remaining items which were considered to be theoretically adequate were categorised into these factors. In all cases, item a) is the holistic and item b) the mechanistic item.
Table 5

*Remaining OMPI items organised into theoretically meaningful factors.*

<table>
<thead>
<tr>
<th>Contextuality</th>
<th></th>
<th>a) Things really look different if we change how we see them.</th>
<th>b) Things really look different only if they are changed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>a) To live independently of other people is not a realistic goal.</td>
<td>b) To live independently of other people is a realistic goal.</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>a) The world is like a large, living organism.</td>
<td>b) The world is like a large, complex machine.</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>a) Persons and their environments affect each other.</td>
<td>b) Persons are made by their environments.</td>
</tr>
<tr>
<td>Change</td>
<td></td>
<td>a) All things change from one moment to the next.</td>
<td>b) All things stay basically the same over time.</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>a) Events are always new and different in some way.</td>
<td>b) Events are sometimes just the same way as before.</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>a) Each relationship I have is different.</td>
<td>b) Each relationship I have is much like the previous one.</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>a) Things are changed by everything else.</td>
<td>b) Things are changed only when they are directly affected.</td>
</tr>
<tr>
<td>Relativism</td>
<td></td>
<td>a) A child’s world is different from mine.</td>
<td>b) A child’s world is like mine, but he/she knows less.</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>a) Schools should be where a child learns to think for him/herself.</td>
<td>b) Schools should be where a child learns basic information.</td>
</tr>
<tr>
<td>Utilitarianism</td>
<td></td>
<td>a) Living is a process of exchanging supplies back and forth.</td>
<td>b) Living is a process of using up the available supplies.</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>a) A child discovers the world by testing his/her dreams and fears.</td>
<td>b) A child discovers the world by being praised and punished.</td>
</tr>
</tbody>
</table>
There was also a fourth factor in Table 5, as three items appeared to assess utilitarian outcomes. This is theoretically consistent, as Gare (1996) and McGilchrist (2009) suggests that mechanism often results in a focus on instrumental, utilitarian outcomes. A concern with this however, is that the results from Study 2 indicated that higher levels of holism were associated with placing more importance on intrinsic than extrinsic outcomes. Gare (1996) and McGilchrist (2009) suggest that an increase in materialism according with higher levels of mechanistic rather than holistic perspectives is the result of focussing on quantifiable, utilitarian outcomes. Therefore, mechanism is theoretically more likely to be a precursor to utilitarianism rather than utilitarianism being an inherent component of mechanistic thinking.

As there was only one item in the relativism factor however, a number of supplemental items were created, as displayed in Table 6. New items were not created for the utilitarianism factor, as this factor may not be theoretically applicable in a revised measure.
Table 6

*New items to supplement the OMPI.*

<table>
<thead>
<tr>
<th>Relativism</th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| 1            | a) | If two people are arguing about something, they might both be right if you consider both perspectives.  
               | b) | If two people are arguing about something, one of them must be wrong. |
| 2            | a) | Reality is subjective and different for all people.  
               | b) | There is a single objective reality which is true for all people. |
| 3            | a) | We do not see the world for what it is, but how we are.  
               | b) | There is a single objective truth, no matter what perspective you take. |
| 4            | a) | There is not always one ‘right’ answer, just different perspectives.  
               | b) | There is always a ‘right’ answer and a ‘wrong’ answer. |

<table>
<thead>
<tr>
<th>Change</th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| 1            | a) | Most things in life are in a constant state of flux and change  
               | b) | Most things in life remain constant and unchanging |

<table>
<thead>
<tr>
<th>Context</th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| 1            | a) | Society is a result of all people connected as a whole  
               | b) | There is no such thing as society, just individuals and their families. |
| 2            | a) | Organisms shape, and are shaped by, their respective environments.  
               | b) | Organisms are independent of their respective environments. |
| 3            | a) | It is not possible to be completely independent in society; all people rely on others one way or another.  
               | b) | It is completely possible to be independent in society without relying on anyone. |
| 4            | a) | The universe, like a living organism, consists of complex, interrelated processes.  
               | b) | The universe, like a machine, consists of separate parts that work together. |
Assessing the validity of the OMPI

As it is intended to remove a number of items from the OMPI, it will be assessed whether the revised measure performs at least as well as the original scale. To assess the validity of the original OMPI (Johnson et al., 1988) and the revised scale, relevant convergent measures will be used. First, as mechanistic thinking is expected to be associated with right-wing political ideologies such as neoliberalism and neoconservatism (Heywood, 2007) which emphasise atomistic, individualistic ways of conceptualising society in general (Gare, 1996; McGilchrist, 2009), OMPI scores are expected to be associated with political affiliation. In particular, lower OMPI scores indicating mechanistic thinking are expected to be reported by individuals who identify themselves as having a right-wing political affiliation. In addition, as holistic Asian respondents tend to be collective and analytic American respondents tend to be individualistic, it is expected that higher OMPI scores (i.e., higher levels of organismic/holistic thinking) will be associated with having a collective self-construal. Mechanism (i.e., represented by low OMPI scores) is expected to be associated with having an independent self-construal. Finally, lay theories (Dweck, 1999; Dweck et al., 1995) were previously suggested to be conceptually similar to holistic and mechanistic thinking as conceptualised by Gare (1996) and McGilchrist, (2009). It is expected that higher OMPI scores will be associated with scores which indicate having incremental rather than entity lay theories. The same pattern of results is also expected for the AHS.
Chapter 21: Study 3 Hypotheses

The hypotheses in Study 3 pertain to the influence of parenting styles on holistic and mechanistic thinking. The study also aims to replicate findings from Study 2 using the OMPI rather than the AHS. Overall, it is anticipated that parenting styles will be indirectly associated with wellbeing due to the mediating influence of holistic/mechanistic thinking, aspirations, regulation, and self-esteem. The hypothetical model is shown in Figure 10. The third study also aims to revise the OMPI by removing items which may be theoretically flawed.

Parenting styles and holistic thinking

Parenting styles. As shown in Figure 10, it is expected that parenting styles may influence levels of holistic/organismic and mechanistic thinking. In particular, it is hypothesised that individuals who retrospectively rate their parents as having been primarily authoritative will report higher scores on holism, leading to a direct path between authoritative parenting and holistic thinking. In comparison, a direct path between higher levels of authoritarian parenting and increased mechanistic thinking is expected. The relationship between permissive parenting and holistic/mechanistic thinking will be explored.

In accordance with previous research (e.g., Abar et al., 2009; Chirkov et al., 2003, 2005; Grolnick et al., 1997; Keller, 2008; Patock-Peckham et al., 2001) it is expected that authoritative parenting will be directly associated with higher levels of autonomous regulation (e.g., higher GMS scores), and authoritarian parenting will be directly associated with lower GMS scores representing more controlled regulation. Higher levels of permissive parenting may also be associated with low GMS scores, in accordance with the proposed link between permissive parenting and amotivation (Baumrind, 1966).
Based on the significant direct path from holistic thinking to aspirations in Study 2, and the theory that mechanistic thinking has contributed to the development of a consumer culture (Gare, 1996; McGilchrist, 2009), it is hypothesised that higher OMPI scores representing higher levels of organismic (i.e., holistic) thinking will be directly associated with lower REVO scores (i.e., placing more importance on intrinsic than extrinsic
aspirations). Materialism will not be investigated in Study 3 as the first two studies have established that placing more importance on extrinsic than intrinsic aspirations is directly associated with reduced materialism, and that materialism is not directly associated with wellbeing. A further reason for emphasising aspirations rather than materialism is previous research from Kasser et al. (1995) indicated that lower levels of maternal nurturance (e.g., what might be expected from authoritarian or permissive parenting) is associated with placing more importance on extrinsic aspirations.

In accordance with the significant paths obtained from the models in Studies 1 and 2, it is expected that lower REVO scores (i.e., placing more importance on intrinsic than extrinsic aspirations) will be directly associated with higher levels of autonomous regulation (i.e., higher GMS scores) and indirectly associated with higher self-esteem due to the expected direct path between higher levels of autonomous regulation and higher self-esteem. Finally, based on the findings from the models in Studies 1 and 2, it is anticipated that higher levels of self-esteem will directly contribute to higher levels of wellbeing. Self-actualization was not included in the current model as it was found in Study 2 to not directly contribute to greater wellbeing.

Therefore, authoritative parenting is expected to be indirectly associated with higher levels of wellbeing due to higher levels of holistic thinking leading to a greater focus on intrinsic than extrinsic aspirations, and higher levels of autonomous regulation and self-esteem. Conversely, higher levels of authoritarian parenting may be indirectly associated with lower levels of wellbeing due to an orientation towards mechanistic thinking which may result in a greater comparative focus on extrinsic than intrinsic aspirations, controlled regulation, and reduced self-esteem. The indirect relationship between permissive parenting and wellbeing including holistic/mechanistic thinking will be explored.
Modification of the OMPI

As the OMPI may not accurately discriminate between those who are genuinely holistic or mechanistic, the study will also aim to develop a revised measure. Prior to removing items from the OMPI, it will be assessed using Confirmatory Factor Analysis (CFA), as this had not been performed by Johnson et al. (1988). If the model fit is found to be inadequate, the model will be modified. Byrne (2011) and Bollen (1989) suggest that scale reduction using CFA should be done with both theoretical and statistical concerns in mind. Thus, items will be removed on statistical grounds and the aforementioned theoretical concerns with certain items. Once a model that provides adequate model fit and includes theoretically acceptable items is obtained, if required, new items (see Table 10 on p. 268) will be added in order to create a revised, three-factor (i.e., change, relativism, contextuality) measure of holistic and mechanistic thinking.

To determine whether the modified measures are suitable, internal consistency, and correlations between the original OMPI, the revised measures, the AHS, and measures of nonattachment, political affiliation, individual and collective self-construals, and lay theories will be assessed. In particular, it is expected that higher scores on the OMPI, the revised measures, and the AHS (i.e., higher levels of holistic thinking), will be associated with higher scores on nonattachment, left-wing political affiliation, higher levels of collective and relational rather than individual self-construal, and a greater tendency to report having incremental rather than entity lay theories.
Chapter 22: Study 3 Method and Results

Method

Three samples were collected in order to investigate the hypotheses based on the model in Figure 10. The first sample comprised first year undergraduate students and was used to investigate the influence of parenting styles on holistic and mechanistic thinking and indirect relationships with wellbeing. Undergraduate students were assessed as Buri (1991) also used an undergraduate sample to develop the Parental Assessment Questionnaire (PAQ). Samples 2 and 3 were also collected online for the purpose of validating a revised version of the OMPI. Data from all three samples was used to validate the OMPI.

Participants and Procedure

Sample 1. After the removal of 31 respondents who did not complete a majority of the survey, the undergraduate sample comprised 302 respondents (234 females, 67 males, 1 not reported) with an age range of 18 to 53 ($M = 20.74$, $SD = 5.17$).

All participants were current first year undergraduate students who had been residing in Australia for at least 10 years. A majority of participants were born in Australia (85.20%), followed by South Africa (1.32%), England (1.32%), New Zealand (1.32%), India (1.32%) and China (.99%). The remaining respondents were born in a range of European, Asian, and African nations. A majority of respondents (79.47%) primarily identified with Australian culture followed by Chinese (2.32%), Greek (2.32%), Indian (2.32%), English (1.99%), and Italian (1.99%) cultural backgrounds. A range of Asian and European cultural affiliations were also reported.

Participants were recruited through a program in first year undergraduate psychology in which students are provided with the opportunity to participate in research for course
Students were freely able to select the current study from a website in which all studies are listed in alphabetical order. Each participant completed the survey at a time and place of their choosing.

**Sample 2.** After removing 69 respondents who did not complete the entire survey, the sample comprised of 142 respondents (66 females, 76 males). A further 28 respondents did not reside in Australia, the United States or another Western-cultural country, and were removed. This decision was made based on the belief that mechanistic thinking has influenced Western culture (Gare, 1996, McGilchrist, 2009). The sample thus comprised 114 respondents (52 females, 62 males) aged from 18 to 81 (\(M = 35.39, SD = 16.23\)). At the time of completing the survey, 62.30% of participants were residing in Australia, 32.40% in the United States and 5.3% in England. A majority of respondents (57.10%) primarily identified with Australian culture, followed by American (27.20%), English (10.50%), or stated that they did not identify with any particular culture.

A majority of the sample were current undergraduate (15.80%) or postgraduate (15.80%) students, or had completed undergraduate (25.40%) or postgraduate (14%) study. Participants had also completed high school (13.20%), a vocational diploma (8.80%) or a trade apprenticeship (1%) as their highest level of educational attainment. A further 6% did not complete high school.

Participants were recruited by emailing those who had successfully participated in Study 1 and provided consent to be contacted to participate in future studies (\(n = 89\)). Participants were also recruited by posting links to the survey on political forums on the website Reddit (\(n = 53\)). The email and forum postings included a description of the study and a link to the survey. Participants were able to follow the link of their own accord and to complete the survey at a time and place of their choosing.
Sample 3. Fifty respondents were removed from the analysis as they did not complete a majority of the survey. The sample comprised 154 respondents (83 males, 71 females). A small number of participants from India (n = 20) were removed in order to maintain a homogenous American sample. The final sample comprising 134 respondents (67 males, 67 females) was aged from 18 to 72 (M = 35.55, SD = 13.40). All participants were born and were residing in the United States of America. With the exception of three participants who each nominated Brazilian, Italian, and Indian cultural backgrounds, all participants identified with American culture.

Respondents were either current undergraduate (32.80%) or postgraduate (9%) students, or had completed undergraduate (22.40%) or postgraduate (11.90%) study. Completion of a high school diploma (15.70%) and trade qualifications (11.90%) were also reported as the highest levels of educational attainment. A further 3% of respondents did not complete high school.

The Mechanical Turk website (www.mturk.com) was used to advertise the study and recruit participants. Each study that is posted on the website includes information regarding the approximate length of time the study will take to complete and how much participants will be paid for successfully completing the study. All studies are displayed on a list which can be ordered according to the user’s preference (e.g., by newest to oldest studies, alphabetical order, by how much each study is paying). Respondents who selected the current study from the list were provided with information about the study and a link to the online questionnaire. Participants were able to complete the study at a time and place of their choosing.

Materials

Administered to all samples.
Organismic Mechanistic Paradigm Inventory. All participants (i.e., Samples 1, 2, and 3) completed the Organismic Mechanistic Paradigm Inventory (OMPI; Johnson et al., 1988), in addition to 15 supplementary items (see Table 10 on p. 268) created for the purpose of revising the OMPI. The OMPI measures two fundamental ontological perspectives; organismism (i.e., the universe exists as complex, interrelated processes) and mechanism (i.e., the universe exists as separate parts which can be understood in isolation from the whole).

The original OMPI consists of 26 forced-choice questions covering a range of philosophical (e.g., ontology, epistemology, causality, change) and practical issues (e.g., parenting styles, occupational, legal and interpersonal concerns; Johnson et al., 1988). Each question is made up of two statements. For example, the organismic statement, “The world is like a large, living organism” is matched by the mechanistic statement, “The world is like a large, complex machine”. Respondents must select their preferred option. One point is given to each organismic statement chosen. Therefore, the possible range of scores is 0 to 26, with higher scores reflecting higher levels of organicism.

Germer, Efran, and Overton (1982, as cited in Johnson et al., 1988) found the OMPI to be adequately reliable (α = .76). No reliability coefficients were reported by Johnson et al., (1988). In the current study the reliability was found to be low, but still adequate, α = .63.

As mentioned previously, Johnson et al. (1988) found the OMPI to be an adequately valid measure. For example, social psychologists were found to be more organicist than behaviourists, and individuals who reported higher levels of organicism were also more open to change and complexity. Similar findings were reported by Babbage and Ronan (2000). Organismic psychotherapists have also been found to be more likely to view problems in life as processes of change involving emotional experience, expression, and exploration (Lyddon
& Adamson, 1992; Lyddon & Bradford, 1995; see also Arthur, 2000; Neimeyer et al., 1993; Vasco et al., 1993).

**Political affiliation.** All participants were given a single statement; “In political matters, people talk about ‘the left’ and ‘the right’. On a scale from 1 to 10 where 1 = Left and 10 = Right, where would you place your views generally speaking?” This measure has previously been used in the World Values Scale (see Inglehart et al., 2000).

**Administered to Sample 1 only.**

The measures provided to Sample 1 were used with the intention of investigating the indirect influence of parenting on wellbeing as a result of levels of holism, aspirations, regulation, and self-esteem. The aspiration index assessing intrinsic and extrinsic aspirations (Grouzet et al., 2005), General Motivation Scale (GMS; Pelletier et al., 2011) and Rosenberg Self-esteem Scale (Rosenberg, 1989) from Studies 1 and 2 were administered to Sample 1. As shown in Table 7, these scales were highly reliable in the current study.

**Table 7**

*Reliability coefficients for measures administered to Sample 1.*

<table>
<thead>
<tr>
<th>Measure</th>
<th>(\alpha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspiration Index (overall)</td>
<td>.93</td>
</tr>
<tr>
<td>Aspiration Index (intrinsic subscale)</td>
<td>.92</td>
</tr>
<tr>
<td>Aspiration Index (extrinsic subscale)</td>
<td>.92</td>
</tr>
<tr>
<td>General Motivation Scale</td>
<td>.83</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>.87</td>
</tr>
</tbody>
</table>
Wellbeing. In Studies 1 and 2 wellbeing was assessed with a combination of life satisfaction, vitality, and depression. For the third study it was decided to assess wellbeing in accordance with Subjective Wellbeing (SWB), which comprises a positive global assessment of life (i.e., satisfaction with life), high positive affect and low negative affect (Csikszentmihalyi & Seligman, 2000; Diener et al., 1996, 1999). This was to ensure that findings this thesis pertaining to wellbeing are consistent across multiple methods of assessing wellbeing, and not simply a result of using a combination of life satisfaction, vitality, and depression. Thus, to assess SWB, the five-item Satisfaction With Life Scale (SWLS; Diener et al., 1985) was used, and again found to be highly reliable, α = .86. The International Positive Affect Negative Affect Scale Short Form (I-PANAS-SF; Thompson, 2007) was also used to measure SWB.

The I-PANAS-SF (Thompson, 2007) was developed from the original PANAS (Watson, Tellegen, & Clark, 1988) which comprised 20 items. Thompson (2007) assessed the original 20 items in a multicultural sample, which did not provide an adequate fitting two-factor model. Items were removed on the basis of low item-total correlations and overall reliability of the positive and negative affect subscales. Subsequent analyses by Thompson on the I-PANAS-SF found that it provided adequate fitting structural equation models, and suitable reliability, α = .78, .76. Both the short positive affect subscale correlated with the original subscale (r = .65) and the short negative affect subscale with the original subscale (r = .59) at moderate to strong levels. Over an eight-week interval, the short positive and negative affect subscales were found to display good test-retest reliability, both r = .84. Positive affect was associated with higher levels of life satisfaction and happiness, whereas the opposite was found for negative affect.

The scale provides a prompt to participants (“Thinking about yourself and how you normally feel, to what extent do you generally feel”) who must then select how often they
felt, for example, ‘Upset’, ‘Ashamed’ or ‘Active’, on a five-point scale (1 = Never; 5 = Always). Scores from each subscale are summed to create independent positive and negative affect scores. Scores range from 1 to 5, with higher scores indicating a greater level of either positive or negative affect. The five negative affect items (α = .75) and five positive affect items (α = .81) of the I-PANAS-SF were found to be adequately reliable in the current study.

**Parental Assessment Questionnaire.** To assess the perceived parenting style used by the participants’ parents, a short form (Alkharusi, Aldhafrı, Kazem, Alzubiadi, & Al-Bahrani, 2011) of the Parental Assessment Questionnaire (PAQ; Buri, 1991) was used. The original PAQ comprises 30 items for each the maternal and paternal parenting styles (60 items in total), with 10 items measuring each of authoritarian, authoritative, and permissive parenting (e.g., Baumrind, 1966, 1971, 1972).

The Parental Assessment Questionnaire-Short (PAQ-S; Alkharusi et al., 2011) comprises 20 items separately assessing each of maternal and paternal parenting styles (40 items in total). Seven items pertain to authoritative, seven to authoritarian, and six items assess permissive parenting. The PAQ-S was developed with a large sample (N = 3025), with items removed during factor analyses if they cross-loaded on multiple factors, or did not load on any factor. The 20 item scales for maternal and paternal parenting styles provided adequate statistical models in CFA, and better model fit than the original 30 item scales.

The authoritative (e.g., “Once family policy has been established, my mother/father discussed the reasoning behind the policy with the children”), authoritarian (e.g., “As I was growing up, my mother/father let me know what behaviour she/he expected of me, and if I didn’t meet those expectations she/he punished me”), and permissive (e.g., “My mother/father has always felt that children need to be free to make up their own minds and do what they want to do, even if this does not agree with what their parents might want”) items
are measured on a five-point scale (1 = Strongly disagree; 5 = Strongly agree). The items for each parenting style are summed and averaged so that scores range from 1 to 5, with higher scores indicating a greater retrospective perception of one’s parents using that parenting style. In the current study maternal authoritative ($\alpha = .84$), authoritarian ($\alpha = .86$), and permissive ($\alpha = .69$) parenting were found to be adequately reliable. Paternal authoritative ($\alpha = .83$) and authoritarian ($\alpha = .85$) parenting were highly reliable, however reliability for paternal permissive parenting ($\alpha = .60$) was poor.

Alkharusi et al. (2011) determined that the PAQ-S was a valid measure of parenting styles, as it provided a three factor solution in EFA and adequate statistical models in CFA. The subscales of the PAQ-S displayed intercorrelations in accordance with findings from Buri (1991) using the original PAQ. That is, for both maternal and paternal parenting styles, authoritarian parenting was associated with lower levels of authoritative and permissive parenting. Authoritative and permissive parenting styles were not significantly correlated. The PAQ-S also correlated strongly with the original PAQ. In accordance with the notion that authoritative parenting should lead to more positive developmental outcomes (Baumrind, 1971; Deci & Ryan, 1985, 2000), Alkharusi et al. (2010) found that students who reported lower levels of academic, economic, personal, health, family, and emotional problems, tended to consider their parents as being higher on authoritativeness, and lower on authoritarian and permissive parenting styles.

**Administered to Sample 2 only.**

A number of measures used in Study 2 were again used in the current study and administered to respondents in Sample 2 in order to validate the OMPI and revised version of the OMPI. Reliability coefficients for these measures are summarised in Table 8. These measures included the Analytic Holistic Scale (Choi et al., 2007), Epistemic Preference
Indicator-Revised (Elphinstone et al., 2014), materialism (Richins, 2004), self-actualization (Jones & Crandall, 1986), subjective vitality (Ryan & Frederick, 1997) and nonattachment. In this case, a short form of the Nonattachment Scale (NAS-7; Elphinstone, Sahdra, & Ciarrochi, 2014) was used.

The NAS-7 comprises a subset of seven items from the original NAS (Sahdra et al., 2010), measured on a six-point scale (1 = Disagree Strongly; 6 = Agree Strongly). Elphinstone et al. (2014) found the NAS-7 to be adequately (α = .83 - .84) reliable. The NAS-7 was found to display better model fit and reliability than the original 30-item NAS (as used in Study 2), and was associated with greater acceptance of current circumstances, higher levels of autonomous regulation, wellbeing, self-actualization, mindfulness, and reduced materialism and depression (Elphinstone et al., 2014). Measures were also included to assess self-construal and entity/incremental lay theories.

Table 8

<table>
<thead>
<tr>
<th></th>
<th>α</th>
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<tbody>
<tr>
<td>Analytic Holistic Scale</td>
<td>.77</td>
</tr>
<tr>
<td>Epistemic Preference Indicator-Revised (IP)</td>
<td>.77</td>
</tr>
<tr>
<td>Epistemic Preference Indicator-Revised (DP)</td>
<td>.72</td>
</tr>
<tr>
<td>Materialism</td>
<td>.81</td>
</tr>
<tr>
<td>Self-actualization</td>
<td>.72</td>
</tr>
<tr>
<td>Subjective vitality</td>
<td>.89</td>
</tr>
<tr>
<td>Nonattachment</td>
<td>.82</td>
</tr>
</tbody>
</table>
**Relational Individual Collective scale.** The original Relational, Individual, Collective scale (RIC; Kashima & Hardie, 2000) was designed to measure relational, individual, and collective self-construals. The RIC is comprised of 10 sets of questions, each with three options. For example “I think it is most important in life to…” is completed separately by “Have personal integrity/be true to myself” (individual), “Have good personal relationships with people who are important to me” (relational) and “Work for causes to improve the wellbeing of my group” (collective). Respondents are required to respond to each option, measured on a seven point scale (1, Does not describe me, not true of me; 7, Describes me, very true of me). The relational (α = .85), individual (α = .82) and collective (α = .81) measures were also found to be adequately reliable (Kashima & Hardie, 2000).

Hardie (2009) developed a short version of the RIC comprising nine questions across three question sets. For example, “I find it very satisfying to do something…” is completed by, “for the benefit of someone else” (relational), “just for myself” (individual), and “for the benefit of other people” (collective). While less reliable than the original measure, each shortened subscale (relational, α = .69; individual, α = .67; collective, α = .71) was found to be adequately reliable (Hardie, 2009). In the current study, the brief RIC was found to be adequately reliable overall, α = .75. Relational (α = .38), individual (α = .42), and collective (α = .74) self-construals varied from poor to adequate reliability.

Validity for the original RIC was demonstrated by theoretically appropriate, significant correlations with a range of measures assessing individual, collective, and independent self-construals. Females were also found to report a higher relational self-construal than male respondents (Kashima & Hardie, 2000). The short version of the RIC was found to provide an adequate three-factor CFA model and correlated appropriately with the original RIC and convergent measures. Female respondents were also found to report a greater relational self-construal than male respondents (Hardie, 2009).
Implicit lay theories. Incremental (i.e., tendency to consider broad contextual factors) and entity (i.e., tendency to focus on unchanging, fundamental dispositions or characteristics) lay theories were assessed with the measures developed by Dweck and colleagues (see Dweck et al., 1995 for a review). All implicit theory sets (i.e., world, person, morality, intelligence) are measured with three items. These items are ordinarily measured on a scale from 1 (Strongly Agree) to 6 (Strongly Disagree; Dweck et al.). It was decided to measure these items on a scale from 1 (Strongly Disagree) to 6 (Strongly Agree) in order to maintain the same response format for all questionnaires within the survey, so that high scores represent agreement. This modified scoring method was used by Eigenberger et al. (2007), and did not compromise the efficacy of the lay theory measures.

Four implicit theories were assessed; intelligence (e.g., “You have a certain amount of intelligence and you really can’t do much to change it”), morality (e.g., “A person’s moral character is something very basic about them and it can’t be changed much”), people in general (e.g., “The kind of person someone is, is very basic about them and it can’t be changed much”) and about the world in general (e.g., “Though we can change some phenomena, it is unlikely that we can alter the core dispositions of our world”).

Dweck et al. (1995) found that the internal consistency across numerous studies for the intelligence (α = .94 to .98), morality (α = .85 to .94), and general person (α = .90 to .96) implicit theories were found to be excellent. Intelligence (r = .80), morality (r = .80), and implicit person (r = .82) theories were found to be reliable over a two week interval. Correlations and reliability for the world implicit lay theories were not reported. In the current study, the intelligence (α = .94), morality (α = .86), person (α = .89), and world (α = .86) implicit lay theories were found to be highly reliable.
As mentioned previously, the incremental-entity lay theory measures appear to be valid. For example, in accordance with research suggesting that East Asians are more holistic than Westerners, incremental theorists have been found to be more prevalent in Hong Kong compared to American samples (Chiu, Dweck, et al., 1997; Chiu & Hong, 1999). Incremental theorists have been found to be less likely than entity theorists to make fundamental attribution errors (Dweck et al., 1995) by being more likely to consider contextual factors (e.g., Blackwell et al., 2007; Diener & Dweck, 1978, 1980; Henderson & Dweck, 1990).

Results

Assessment of OMPI

Prior to conducting the main analyses, as the OMPI may comprise items which do not adequately measure holistic or mechanistic thinking, it was decided to assess the measure and if necessary, remove items. Byrne (2011) and Bollen (1989) suggest that scale reduction using CFA should be done with both theoretical and statistical concerns in mind. Thus, rather than initially removing all items which were deemed as being theoretically flawed, it was decided to examine their statistical performance. If the items are not measuring the theory of holistic or mechanistic thinking as expected, they should contribute less variance to the model and thus detract from overall model fit in comparison to items which are not theoretically flawed. That is, flawed items may be measuring other distinct constructs, beliefs or values which are related to, but not core aspects of holistic or mechanistic thinking. The supplementary items which were created will be considered after assessing the original OMPI.
Assessing the OMPI

**Data screening.** In order to create a large sample for the purpose of assessing the OMPI, Samples 1, 2, and 3 were combined, leading to a sample of \( N = 550 \). To satisfy the assumption of there being no multivariate outliers for SEM analysis (Tabachnick & Fidell, 2007), Mahalanobis’ distance scores were calculated. No multivariate outliers were detected. According to Rummel (1970) with dichotomous variables, outliers are generally those responses that may make up the minority in a 90-10 split between responses. That is, responses from the 10% of participants who selected a certain answer may be outliers. The frequency of responses for each answer was examined, which indicated that for each item, there was generally a 50-50 split, with the most extreme being close to a 70-30 split. Skewness and linearity were unable to be calculated due to the dichotomous response format.

**Confirmatory Factor Analyses**

Assessment of the original 26-item model. Prior to removing items, it was decided to first examine the original OMPI using Confirmatory Factor Analysis (CFA) with MPlus version 6 (Muthén & Muthén, 2010) to determine whether the original scale would provide adequate model fit. A model was created with a single latent variable comprising all 26 organismic (i.e., holistic) items as Johnson et al. (1988) considered the OMPI to be a one factor model. No error covariance was created between items. There were 52 parameters to be estimated with a sample of 550, resulting in an acceptable ratio of 10.58:1 (Bollen, 1989; Jackson, 2003).

Due to multivariate skewness of the 12 variables (Mardia’s coefficient = 5.40), the Weighted Least Squares Means and Variance Adjusted (WLSMV) chi-square estimation method was used to account for non-normality. WLSMV does not assume normal distributions and is suitable for categorical data (Brown, 2006; Muthén & Muthén, 2010).
The output provided by MPlus includes CFI, TLI and the Weighted Root Mean Square Residual (WRMR). The same criteria to determine model fit as used in Studies 1 and 2 (i.e., CFI and TLI ≥ .95, RMSEA ≤ .06; Hu & Bentler, 1999; Kline, 2005) were applied. The WRMR is provided by MPlus for CFA in which categorical variables are used. Each OMPI item is categorical as it is measured dichotomously. A WRMR value of .90 or less is considered representative of good model fit. Despite this, it is considered to be an unreliable fit index, so even if it is above .90, good model fit can still be obtained if the other fit indices are suitable (Schreiber, Nora, Stage, Barlow, & King, 2006; Muthén & Muthén, 2010; Yu, 2002). As a result, the 26-item model was found to be an inadequate fit with the data, $\chi^2$(299) = 581.96, $p < .001$, CFI = .88, TLI = .87, RMSEA = .04 (90% CI = .04-.05), WRMR = 1.23.

Twelve items were initially identified as contributing little variance to the model. Two items (OMPI 20: “War can be understood by examining what purpose it served”; OMPI 21: “The world is like a large, living organism”) each had SMCs of .01, indicating that each item contributed no more than 1% of variance to the model. OMPI 20 had previously been identified as being theoretically flawed, but not item 21. OMPI 21 appears to attempt to measure the idea of the world as an organic, interdependent whole in comparison to being made of up separate parts (i.e., the mirrored mechanistic option). This is however, an abstract concept. Individuals who lack knowledge of complex ecological systems may not view the planet in the same way that other organisms (e.g., animals, people) are viewed.

A further ten items contributed little variance to the model and were previously identified as being theoretically flawed. These items included OMPI 4 (“A good judge is not objective and knows it”, SMC = .07), OMPI 5 (“Great discoveries come from scientific imagination”, SMC = .02), OMPI 8 (“Before making a big decision, I like to sleep on it”, SMC = .05), OMPI 9 (“Progress in science only occurs when there is a new way of looking at
events”, SMC = .03); OMPI 10 (“A criminal has a function in society”, SMC = .03), OMPI 11 (“Our knowledge is limited by our imagination”, SMC = .06), OMPI 14 (“Divorce is often a phase in each partner’s growth”, SMC = .02), OMPI 15 (“Facts are less useful than a good idea”, SMC = .05), OMPI 19 (“To live independently of others is not a realistic goal”, SMC = .08), and OMPI 24 (“A child’s world is different from mine”, SMC = .07).

While OMPI 24 was not previously identified as being theoretically flawed, there may be variability in how respondents understand and respond to the item. The mechanistic item also comprising this response set is, “A child’s world is like mine, except he/she knows less”. It seems that the response set is attempting to assess whether respondents consider reality to be objectively the same or different for all people; in this case, based on differences in how children may view the world. The way in which one conceptualises the ‘world’ in this case, may influence responses. Johnson et al. (1988) may have intended ‘world’ to mean one’s subjective sense of reality. However, ‘world’ could also be interpreted as the current social, economic, and political environment affecting one’s day to day life. In this case, one could argue that a child’s ‘world’ is the same, but he or she knows less about those intervening factors. Therefore, OMPI 24, in addition to all of the aforementioned items, were removed from the model.

**Assessment of the 14 item model.** Prior to reassessing the model, the sample was assessed for multivariate outliers on the remaining 14 OMPI items. Four multivariate were detected due to exceeding the critical Mahalanobis’ Distance value \( \chi^2(14) = 36.12, p < .001 \), and were removed. The model was a good fit with the data, \( \chi^2(77) = 129.63, p < .001, \) CFI = .97, TLI = .97, RMSEA = .04 (90% CI = .02-.05), WRMR = .92. While no modification indices were provided by the output, SMCs were again examined to determine the amount of
variance contributed to the model by each item. According to Byrne (2011) a good model should comprise items with SMCs of at least .25. Four items did not meet this criterion.

Three items, OMPI 7 (“A business executive needs time for creative thinking”, SMC = .09), OMPI 18 (“We learn by finding order in an array of facts”, SMC = .15), and OMPI 26 (“To resolve a family dispute, it is important how we look at the facts”, SMC = .14), contributed an unacceptably low amount of variance and were previously identified as being theoretically flawed.

**Assessment of the 11 item model.** The 11 items were assessed for multivariate outliers, using a critical Mahalanobis’ Distance value of, $\chi^2(11) = 31.26, p < .001$. Four multivariate outliers exceeded this value and were removed. The model was found to be an excellent fit with the data, $\chi^2(44) = 71.91, p < .01$, CFI = .98, TLI = .98, RMSEA = .03 (90% CI = .02-.05), WRMR = .83.

Despite the good model fit, two items (OMPI 23: “I can change things in my family just by being who I am”; OMPI 3: “Organisms can change by themselves”) which had been identified as being theoretically flawed still comprised the model. Regardless, an eleven item, one factor model (henceforth referred to as the OMPI-11, see Table 9) was created which may provide an improvement over the original OMPI. Items appeared to be theoretically consistent with the contextuality, change, causality, and utilitarianism factors (e.g., Gare, 1996; McGilchrist, 2009; Nisbett, 2003).
Table 9

*Items comprising the OMPI-11.*

<table>
<thead>
<tr>
<th>Change</th>
<th>OMPI 3</th>
<th></th>
<th>OMPI 6</th>
<th></th>
<th>OMPI 13</th>
<th></th>
<th>OMPI 17</th>
<th></th>
<th>OMPI 16</th>
<th></th>
<th>OMPI 23</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a)</td>
<td>Organisms can change themselves</td>
<td>b)</td>
<td>Organisms change by forces from outside themselves</td>
<td>a)</td>
<td>All things change from one moment to the next</td>
<td>b)</td>
<td>All things stay basically the same over time</td>
<td>a)</td>
<td>Events are always new and different in some way</td>
<td>b)</td>
<td>Events are sometimes just the same as before</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relativism</td>
<td>OMPI 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a)</td>
<td>Things really look different if we change how we see them</td>
<td>b)</td>
<td>Things really look different only if they are changed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contextuality</td>
<td>OMPI 25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a)</td>
<td>Persons and their environments affect each other</td>
<td>b)</td>
<td>Persons are made by their environments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utilitarianism</td>
<td>OMPI 11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a)</td>
<td>School should be where a child learns to think for her/himself</td>
<td>b)</td>
<td>Schools should be where a child learns basic information</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OMPI 22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a)</td>
<td>A child discovers the world by testing his/her dreams and fears</td>
<td>b)</td>
<td>A child discovers the world by being praised and punished</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OMPI 12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a)</td>
<td>Living is a process of exchanging supplies back and forth</td>
<td>b)</td>
<td>Living is a process of using up the available supplies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Assessment of the Mechanistic Holistic Paradigm Inventory. A revised version of the OMPI, referred to as the Mechanistic Holistic Paradigm Inventory (MHPI) was created by adding new items created for the current study (see Table 10) to OMPI items which were determined to be theoretically and statistically adequate. Despite OMPI 3 and OMPI 23 (see Table 9) contributing to good model fit in the OMPI-11, it was decided to remove them as they may not be theoretically consistent with holistic thinking as defined by Gare (1996) and McGilchrist (2009).

Prior to analysing the MHPI, the sample was assessed for multivariate outliers in the original N = 550 sample. With 15 independent variables (six remaining OMPI items, and nine newly created items), six cases were found to exceed the critical Mahalanobis’ distance value ($\chi^2(15) = 37.70, p < .001$) and were removed ($N = 544$). With 33 free parameters, the case to parameter ratio was 16.49:1. Due to multivariate skewness (Mardia’s coefficient = 92.46), the Weighted Least Squares Means and Variance Adjusted (WLSMV) chi-square estimation method was used to account for non-normality.

A CFA was conducted using MPlus version 6 (Muthén & Muthén, 2010). The model (see Figure 11) comprised three latent variables each including five holistic items representing the change, relativism, and contextuality factors (15 items in total, see Table 10). These three latent variables were then used to comprise the latent MHPI variable. With 18 parameters, a suitable case to parameter ratio (30.22:1) was obtained. The model was found to be an excellent fit with the data, $\chi^2(87) = 146.36, p < .001$, CFI = .99, TLI = .99, RMSEA = .04 (90% CI = .03-.05), WRMR = .81.
Table 10

*Items comprising the MHPI.*

<table>
<thead>
<tr>
<th>Context</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a) The universe, like a living organism, consists as a system of complex, interrelated processes</td>
<td>b) The universe, like a machine, consists of separate parts that work together</td>
</tr>
<tr>
<td></td>
<td>a) Society is a result of all people connected as a whole</td>
<td>b) There is no such thing as society, just individuals and their families</td>
</tr>
<tr>
<td></td>
<td>a) Organisms shape, and are shaped by, their respective environments</td>
<td>b) Organisms are independent of their respective environments</td>
</tr>
<tr>
<td>4</td>
<td>a) It is not possible to be completely independent in society; all people rely on others one way or another</td>
<td>b) It is completely possible to be independent in society without relying on anyone</td>
</tr>
<tr>
<td>5</td>
<td>a) Persons and their environments affect each other</td>
<td>b) Persons are made by their environments</td>
</tr>
<tr>
<td>Change</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>a) Most things in life are in a constant state of flux and change</td>
<td>b) Most things in life remain constant and unchanging</td>
</tr>
<tr>
<td>7</td>
<td>a) All things change from one moment to the next</td>
<td>b) All things stay basically the same over time</td>
</tr>
<tr>
<td>8</td>
<td>a) Things are changed by everything else</td>
<td>b) Things are changed only when they are directly affected</td>
</tr>
<tr>
<td>9</td>
<td>a) Events are always new and different in some way</td>
<td>b) Events are sometimes just the same way as before</td>
</tr>
<tr>
<td>10</td>
<td>a) Each relationship I have is different</td>
<td>b) Each relationship I have is much like the previous one</td>
</tr>
<tr>
<td>Relativism</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>a) If two people are arguing about something, they might both be right, if you consider both perspectives</td>
<td>b) If two people are arguing about something, one of them must be wrong</td>
</tr>
<tr>
<td>12</td>
<td>a) Reality is subjective and different for all people</td>
<td>b) There is a single, objective reality which is true for all people</td>
</tr>
<tr>
<td>13</td>
<td>a) We do not see the world for what it is, but how we are</td>
<td>b) There is a single objective truth, no matter what perspective you take</td>
</tr>
<tr>
<td>14</td>
<td>a) There is not always one 'right' answer, just different perspectives</td>
<td>b) There is always a 'right' answer and a 'wrong' answer</td>
</tr>
<tr>
<td>15</td>
<td>a) Things really look different if we change how we see them</td>
<td>b) Things really look different only if they are changed</td>
</tr>
</tbody>
</table>

*Note:* a) represents holistic and b) represents mechanistic items.
Figure 11. Model for the MHPI (**p < .001, *p < .05).

Comparison of OMPI, OMPI-10, and MHPI

OMPI, OMPI-11, and MHPI scale scores were created in the original N = 550 sample. No univariate outliers were found on any of the three scales. Using SPSS Version 21, the MHPI was found to display excellent reliability (α = .90), followed by the OMPI (α = .50),
and the OMPI-11 ($\alpha = .18$). The results suggested that if one item (“School should be where a child learns to think for her/himself”) were removed, the reliability of the OMPI-11 would increase to $\alpha = .77$. The strongest correlation was between the OMPI and OMPI-11, $r = .77$, $p < .001$. The OMPI and MHPI ($r = .57$, $p < .001$) were also strongly correlated, as were the OMPI-11 and MHPI, $r = .64$, $p < .001$. As these correlations may have been inflated by the inclusion of six OMPI items within the MHPI, the OMPI items were removed and the correlations re-assessed. After removing these six items, the remaining nine MHPI items correlated strongly with the OMPI ($r = .54$, $p < .001$) and OMPI-11, $r = .63$, $p < .001$.

Correlations between the OMPI, OMPI-11, and MHPI were also assessed in Sample 2.

**Correlations in Sample 2.** Sample 2 comprised 114 respondents who successfully completed all of the items comprising the OMPI, OMPI-11, and MHPI. There were however, 13 participants who did not complete all of the convergent measures in the survey. The number of successful completions for each questionnaire in Sample 2 are shown in Table 11. For the purpose of maximising the number of participants for correlations it was decided to retain all participants rather than remove those who did not complete the entire survey.

**Outliers.** Univariate outliers on each measure were detected using histograms, boxplots and examining whether cases had $z$-scores greater than $\pm 3.29$ (two-tailed test, $p < .001$; Tabachnick & Fidell, 2007). The $z$-scores indicated that there was one outlier on the MHPI (-3.83), and another on individual self-construal (-3.41). Both items were removed, reducing the sample in $N = 112$. The sample was also assessed for multivariate outliers on all of the measures, but no cases were found to exceed the critical Mahalanobis’ Distance value, $\chi^2(16) = 39.25$, $p < .001$. 
Table 11

*Successful completions for each measure in Sample 2.*

<table>
<thead>
<tr>
<th>Measure</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>OMPI/OMPI-11</td>
<td>114</td>
</tr>
<tr>
<td>MHPI</td>
<td>114</td>
</tr>
<tr>
<td>AHS</td>
<td>103</td>
</tr>
<tr>
<td>Epistemic style (IP and DP)</td>
<td>114</td>
</tr>
<tr>
<td>Incremental-Entity theorist scales</td>
<td>101</td>
</tr>
<tr>
<td>Nonattachment</td>
<td>101</td>
</tr>
<tr>
<td>Materialism Values Scale</td>
<td>111</td>
</tr>
<tr>
<td>Relational-Individual-Collectivism Scale</td>
<td>101</td>
</tr>
<tr>
<td>Self-Actualization</td>
<td>102</td>
</tr>
<tr>
<td>Subjective Vitality</td>
<td>102</td>
</tr>
</tbody>
</table>

*Distribution of data.* Results of Kolmogorov-Smirnov tests suggested that scores on the MVS \( p = .15 \), AHS \( p = .20 \), OMPI \( p = .09 \), and RIPO \( p = .06 \) scales were normally distributed. All other variables \( p < .01 \) were not normally distributed. Shapiro-Wilk normality tests suggested that materialism \( p = .21 \), AHS \( p = .92 \), RIPO \( p = .11 \), and OMPI scores \( p = .10 \) were normally distributed. All other variables \( p < .01 \) were not normally distributed.

Further analysis, using a critical value of ±3.29 \( p < .001 \) indicated that the MHPI (5.23) and nonattachment (3.38) were significantly positively skewed, whereas the collective self-construal (-3.54) was significantly negatively skewed. These results suggested that respondents tended to report lower scores on collectivism, and higher scores on the MHPI and nonattachment. All measures were also found to be normally kurtotic. As the results did not consistently suggest that a particular variable was skewed, transformations were not performed.
Correlations. Correlations and alpha coefficients for the OMPI, OMPI-10, AHS, and MHPI with convergent measures and political affiliation are summarised in Table 12. The correlations indicated that the OMPI, OMPI-11, AHS, and MHPI were positively correlated at moderate to strong levels, indicating that holistic individuals tended to score higher on all measures. The reliability coefficients indicated that the AHS was adequately reliable whereas reliability for the OMPI and MHPI was poor and unacceptably low for the OMPI-11.

As expected, higher OMPI, OMPI-11, AHS, and MHPI scores (i.e., higher levels of holistic or organismic thinking) were associated with higher RIPO scores (i.e., a greater comparative orientation towards IP than DP). Rather than significant correlations with all measures, only higher scores on the OMPI were associated with greater self-actualization, whereas only higher scores on the MHPI were associated with increased vitality. In line with expectations, higher scores on the OMPI, OMPI-11, and MHPI, but not the AHS, were associated with higher scores on a measure of collective self-construal. Higher scores on the AHS and the OMPI-11 were also associated with having a greater relational self-construal. Contrary to expectation, higher scores on the OMPI (i.e., organismic thinking) were associated with lower scores on the morality, world, and person lay theory measures, indicating a greater tendency to be an entity rather than incremental theorist. The AHS was also associated with lower scores (i.e., entity theorist) on the morality measure. Finally, contrary to expectations, neither the OMPI, OMPI-11, AHS, or MHPI were significantly associated with nonattachment or political affiliation. On the basis of the reliability coefficients and correlations, it appeared that the OMPI may perform better than the OMPI-11.
Table 12

*Correlations between the OMPI, OMPI-10, AHS, and MHPI and convergent measures in Sample 2.*

<table>
<thead>
<tr>
<th></th>
<th>OMPI (α = .61)</th>
<th>OMPI-11 (α = .42)</th>
<th>AHS (α = .75)</th>
<th>MHPI (α = .50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OMPI</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OMPI-11</td>
<td>.63***</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AHS</td>
<td>.32***</td>
<td>.29**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MHPI</td>
<td>.51***</td>
<td>.70***</td>
<td>.44***</td>
<td>-</td>
</tr>
<tr>
<td>RIPO</td>
<td>.39***</td>
<td>.24*</td>
<td>.21*</td>
<td>.23*</td>
</tr>
<tr>
<td>Nonattachment</td>
<td>.12</td>
<td>.18</td>
<td>.08</td>
<td>.15</td>
</tr>
<tr>
<td>Materialism</td>
<td>-.13</td>
<td>-.04</td>
<td>-.17</td>
<td>-.03</td>
</tr>
<tr>
<td>Self-Actualization</td>
<td>.21*</td>
<td>.11</td>
<td>.15</td>
<td>.12</td>
</tr>
<tr>
<td>Vitality</td>
<td>.14</td>
<td>.15</td>
<td>.08</td>
<td>.21*</td>
</tr>
<tr>
<td>Relational</td>
<td>.17</td>
<td>.26*</td>
<td>.30***</td>
<td>.11</td>
</tr>
<tr>
<td>Individualistic</td>
<td>.08</td>
<td>.14</td>
<td>.05</td>
<td>.13</td>
</tr>
<tr>
<td>Collectivistic</td>
<td>.25*</td>
<td>.38***</td>
<td>.15</td>
<td>.20*</td>
</tr>
<tr>
<td>I-E Intelligence</td>
<td>-.06</td>
<td>-.10</td>
<td>.01</td>
<td>-.09</td>
</tr>
<tr>
<td>I-E Morality</td>
<td>-.26***</td>
<td>-.13</td>
<td>-.24*</td>
<td>-.11</td>
</tr>
<tr>
<td>I-E World</td>
<td>-.23*</td>
<td>-.20</td>
<td>-.01</td>
<td>-.16</td>
</tr>
<tr>
<td>I-E Person</td>
<td>-.23*</td>
<td>-.16</td>
<td>-.09</td>
<td>-.14</td>
</tr>
<tr>
<td>Political affiliation</td>
<td>-.14</td>
<td>-.06</td>
<td>-.09</td>
<td>-.04</td>
</tr>
</tbody>
</table>

*Note:* ***p < .001, **p < .01, *p < .05
Assessment of the OMPI and MHPI with parenting styles in Sample 1

Of the 302 undergraduate respondents in Sample 1, four participants did not complete a majority of the measures and were removed from the analysis ($N = 298$). Prior to the removal of outliers (see below), 48 participants did not complete the parenting questionnaire related to paternal parenting styles as they reported that their father did not play an important role in raising them (e.g., they were from a single parent household). A further 15 did not complete the maternal PAQ items for the same reason. These participants were retained for the benefit of examining correlations between other variables but were removed for SEM analyses involving the PAQ.

Outliers. Univariate outliers were detected using histograms, boxplots and examining whether cases had z-scores greater than ±3.29 (two-tailed test, $p < .001$; Tabachnick & Fidell, 2007). One univariate outlier (-3.45) was found on the MHPI, in addition to outliers on negative affect (3.50), positive affect (-3.65), maternal authoritative parenting (-3.45), paternal permissive parenting (3.54), regulation (-4.51), intrinsic aspirations (-4.12, -3.46), and extrinsic aspirations (-3.33). The removal of these outliers reduced the sample to $N = 290$. In addition, two multivariate outliers exceeded the critical Mahalanobis’ Distance ($\chi^2(16) = 39.25, p < .001$) and were removed from the analysis, resulting in a sample size of 288.

Distribution of data. Results of Kolmogorov-Smirnov tests suggested that scores on the GMS ($p = .20$) and on extrinsic aspirations ($p = .06$) were normally distributed. All others variables ($p < .05$) were not normally distributed. Shapiro-Wilk normality tests indicated that paternal authoritarian parenting ($p = .15$), GMS ($p = .11$), extrinsic aspirations ($p = .08$), and maternal permissive parenting ($p = .05$) were normally distributed. Other variables were not normally distributed, $p < .05$. 

Further analysis, using a critical value of ±3.29 ($p < .001$) indicated OMPI-11 (-4.15), MHPI (-7.65), maternal (-3.69) and paternal (-4.15) authoritative parenting, satisfaction with life (-4.19), vitality (-3.60), and intrinsic aspirations (-3.79) were significantly negatively skewed. Thus, participants tended to report higher scores on each of these measures. Scores on negative affect (3.32) were significantly positively skewed, indicating a tendency for lower levels of negative affect. All measures were found to be normally kurtotic. Consistent with previous analyses, transformations were not performed. This was partly because certain variables are likely to be skewed (e.g., wellbeing measures), and that multivariate rather than univariate skewness is a larger concern for SEM (Tabachnick & Fidell, 2007).

**Correlations.** Correlations were assessed using SPSS Version 21. The results are shown in Table 13.
Table 13

*Correlations between the OMPI, OMPI-11, and MHPI with convergent variables in Sample 1.*

<table>
<thead>
<tr>
<th></th>
<th>OMPI (α = .57)</th>
<th>OMPI-11 (α = .47)</th>
<th>MHPI (α = .65)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OMPI</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>OMPI-11</td>
<td>.72***</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>MHPI</td>
<td>.56***</td>
<td>.68***</td>
<td>-</td>
</tr>
<tr>
<td>Relative Extrinsic Values</td>
<td>-.41***</td>
<td>-.32***</td>
<td>-.37***</td>
</tr>
<tr>
<td>Orientation Regulation</td>
<td>.18**</td>
<td>.18**</td>
<td>.25***</td>
</tr>
<tr>
<td>Authoritative (Father)</td>
<td>-.04</td>
<td>.08</td>
<td>.10</td>
</tr>
<tr>
<td>Authoritarian (Father)</td>
<td>-.16*</td>
<td>-.12</td>
<td>-.10</td>
</tr>
<tr>
<td>Permissive (Father)</td>
<td>.05</td>
<td>-.08</td>
<td>-.14*</td>
</tr>
<tr>
<td>Authoritative (Mother)</td>
<td>-.01</td>
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<td>.10</td>
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<tr>
<td>Authoritarian (Mother)</td>
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<td>-.16*</td>
<td>-.17**</td>
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<tr>
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<td>.05</td>
<td>-.07</td>
<td>-.16**</td>
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<tr>
<td>Self-Esteem</td>
<td>.11</td>
<td>.11</td>
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<tr>
<td>Life Satisfaction</td>
<td>.11</td>
<td>.14*</td>
<td>.12*</td>
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<tr>
<td>Negative Affect</td>
<td>-.16**</td>
<td>-.21***</td>
<td>-.20**</td>
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<tr>
<td>Positive Affect</td>
<td>.11</td>
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<td>.14*</td>
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<tr>
<td>Political affiliation</td>
<td>-.23***</td>
<td>-.16**</td>
<td>-.18**</td>
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*Note: ***p < .001, **p < .01, *p < .05*

The correlations indicated that the OMPI, OMPI-11, and MHPI were strongly correlated, suggesting that higher scores on one measure (i.e., higher levels of holism) were associated with higher scores on the other measures. As expected, higher scores on the
OMPI, OMPI-11, and MHPI were associated with lower REVO scores, which indicated a tendency to place more importance on intrinsic than extrinsic aspirations. Higher scores on all three measures were also associated with lower levels of negative affect, and as expected, a tendency to report a left-wing (i.e., lower scores) political orientation.

In accordance with expectations, higher OMPI scores were associated with lower levels of paternal and maternal authoritarian parenting. Higher MHPI scores were associated with lower levels of maternal authoritarian parenting, and lower levels of paternal and maternal permissive parenting. Higher OMPI-11 scores were associated with increased maternal authoritative and reduced maternal permissive parenting. Higher scores on the OMPI-11 and MHPI were also associated with greater levels of life satisfaction. Correlations were also assessed between other variables used in Sample 1 (see Table 14).
Table 14

*Correlations between convergent variables in Sample 1.*

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<td>1. Relative Extrinsic Value Orientation</td>
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<td>2. GMS</td>
<td>-.39***</td>
<td>-</td>
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<td>-.10</td>
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<td>-</td>
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<tr>
<td>5. Permissive (Father)</td>
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<td>-.08</td>
<td>-.11</td>
<td>-.36***</td>
<td>-</td>
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<td>6. Authoritative (Mother)</td>
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<td>-.13*</td>
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<td>7. Authoritarian (Mother)</td>
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<td>.31***</td>
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<td>8. Permissive (Mother)</td>
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<td>-.15*</td>
<td>.07</td>
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<td>.13*</td>
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<td>9. Self-Esteem</td>
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<tr>
<td>10. Life Satisfaction</td>
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<td>.26***</td>
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<td>.01</td>
<td>.22***</td>
<td>.00</td>
<td>.09</td>
<td>.60***</td>
<td>-</td>
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<tr>
<td>11. Negative Affect</td>
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<td>-.27***</td>
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<td>-.48***</td>
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<td>12. Positive Affect</td>
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<td>.24***</td>
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<td>.09</td>
<td>.57***</td>
<td>.48***</td>
<td>-.36***</td>
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*Note:*** p < .001, ** p < .01, * p < .05*
Higher REVO scores (i.e., more importance placed on extrinsic than intrinsic aspirations) was associated with more controlled regulation (i.e., lower GMS scores), higher levels of paternal authoritative, paternal and maternal authoritarian parenting, and maternal permissive parenting. Placing more importance on extrinsic than intrinsic aspirations was also associated with reduced self-esteem, life satisfaction and positive affect, and higher levels of negative affect.

Higher GMS scores (i.e., a greater level of autonomous regulation) were associated with lower levels of maternal authoritarian and permissive parenting, but not with any other paternal or maternal parenting style. Autonomous regulation was also associated with higher levels of self-esteem, life satisfaction, vitality and positive affect, and lower levels of negative affect.

In terms of parenting, it was found that the pairs of maternal and paternal authoritative, authoritarian, and permissive parenting were each positively correlated. This suggested that respondents who recalled their father as being more authoritarian also recalled their mother as being more authoritarian, for example. Maternal and paternal authoritative parenting styles were significantly associated with higher levels of life satisfaction and positive affect. Maternal authoritative parenting was also significantly associated with lower levels of negative affect. Paternal authoritativeness was not significantly associated with any other maternal or paternal parenting style. Maternal authoritative parenting was significantly associated with higher levels of paternal authoritarian parenting and maternal permissive parenting, and lower levels of permissive paternal parenting, and maternal authoritarian parenting. Maternal authoritarian parenting was found to be associated with lower levels of maternal permissive parenting. Similarly, higher levels of paternal authoritarianism were associated with lower scores on paternal permissive parenting. Maternal and paternal authoritarianism and paternal permissive parenting styles were not significantly associated
with any other variables. Maternal permissiveness was associated with higher scores on vitality.

Finally, self-esteem, life satisfaction, and positive affect were all positively correlated, indicating that a higher score on one predicted a higher score on the other measures of wellbeing. These variables were also significantly associated with lower levels of negative affect.

**Structural Equation Modelling**

**OMPI and paternal parenting styles.** Prior to assessing the hypothetical model (see Figure 10), 46 respondents who did not complete the paternal parenting styles questionnaire were removed, resulting in a sample size of \( N = 242 \). Due to multivariate skewness of the 12 variables (Mardia’s coefficient = 11.43), the Robust Maximum Likelihood estimation method was used to account for non-normality. With 36 distinct parameters, the model had a case to parameter ratio of 6.72:1, above the minimum 5:1 level suggested by (Bentler & Chou, 1987). The model was found to be a poor fit with the data, \( \chi^2(29) = 91.47, p < .001, \text{CFI} = .87, \text{TLI} = .82, \text{RMSEA} = .09 \) (90% CI = .07-.12), \( \text{SRMR} = .07 \).

The results suggested that the paths from authoritative and permissive parenting to OMPI scores were not significant, and that the direct paths from each parenting style to regulation were not significant. The largest modification index (21.99) suggested that a direct path from authoritative parenting to wellbeing should be created. It was decided to add this path, as authoritative parenting has been found to result in higher levels of self-esteem, life satisfaction and reduced depression (Milevsky, Schlechter, Netter, & Keehn, 2007). Alkharusi et al. (2010) also found that children who reported fewer personal and emotional problems rated their parents as being higher on authoritative parenting. After the inclusion of
these two paths model fit was still unacceptable, $\chi^2(28) = 68.47, p < .001$, CFI = .92, TLI = .88, RMSEA = .08 (90% CI = .05-.10), SRMR = .05.

Modification indices suggested adding direct paths from authoritative (MI = 8.95), authoritarian (MI = 6.55) and permissive (MI = 5.46) parenting to aspirations. The addition of these paths is theoretically suitable, as parental influence has been implicated in higher levels of materialism (Csikszentmihalyi & Rochberg-Halton, 1981; Kasser et al., 1995). These studies however, suggested that parental materialistic values rather than parenting styles may contribute to higher levels of materialism in children. In accordance with the notion that extrinsic, materialistic values are cultural norms within Western civilisation (DeBord, 1995; Dittmar, 2007; Fromm, 1976/2005; Gare, 1996; Kasser & Ryan, 1993, 1996), it may be that certain parenting styles emphasise these norms to differing extents. For example, as authoritarian parenting may be associated with upholding the status quo of society, higher levels of authoritarian parenting may lead to a greater focus on extrinsic aspirations. In addition, despite research which has suggested that parenting styles influence regulation (e.g., Grolnick et al., 1997; Grolnick & Ryan, 1989; Keller, 2008; Patock-Peckham et al., 2001; Vallerand & Bissonette, 1992), the direct paths from parenting styles to regulation were not significant in the current model. Thus, it was decided to remove these non-significant paths from the model and to include the direct paths from parenting styles to aspirations so as not to have a case to parameter ratio below 5:1 (Bentler & Chou, 1987). As there was a direct path from aspirations to regulation, parenting styles were indirectly associated with regulation. The modified model is shown in Figure 12.
The modifications to the model improved model fit, but not to a completely acceptable level, $\chi^2(28) = 56.90, p < .01, \text{CFI} = .94, \text{TLI} = .91, \text{RMSEA} = .07$ (90% CI = .04-.09), SRMR = .05. With the exception of the CFI and TLI values being below .95, the
RMSEA and SRMR values were indicative of good model fit (Hu & Bentler, 1999; Kline, 2005). As there were no theoretically meaningful modification indices available, the model was not modified further and was deemed suitable enough for the purposes of examining relationships between the variables.

**Direct effects.** Higher levels of authoritarian parenting were directly associated with lower OMPI scores (i.e., mechanistic thinking), accounting for 2.25% of variance. The direct paths from permissive and authoritative parenting to OMPI scores were not significant.

Direct paths from each parenting style to REVO scores were significant. Higher levels of authoritative (3.35% of variance explained), permissive (2.25% variance explained) and authoritarian (2.76% variance explained) parenting were each associated with higher REVO scores, indicating a greater level of importance placed on extrinsic than intrinsic aspirations. Authoritative parenting (6.76% variance explained) was directly associated with higher levels of wellbeing.

Higher OMPI scores indicating higher levels of holistic thinking were directly associated with lower REVO scores (13.84% of variance explained) indicating a greater level of importance placed on intrinsic rather than extrinsic aspirations. Higher REVO scores were directly associated with lower GMS scores (i.e., higher levels of controlled rather than autonomous regulation), accounting for 17.22% of variance. GMS scores accounted for 22.47% of the variance in self-esteem, indicating that higher levels of autonomous regulation were associated with increased self-esteem. Finally, higher levels of self-esteem were directly associated with higher levels of wellbeing, 69.56% of variance explained.

**Covariances.** The relationships between authoritative and both permissive and authoritarian parenting styles were not significant. Higher levels of authoritarian parenting (10.89% variance shared) were significantly associated with lower levels of permissive parenting. Higher levels of vitality also shared 7.18% of variance.
**Indirect effects.**

**Indirect effects from parenting styles.** While a direct path suggested that authoritative parenting was directly associated with wellbeing, an indirect path suggested that authoritative parenting was associated with lower levels of wellbeing (indirect effect = -.03, \( p < .05 \), 3.00% variance explained). Thus, higher levels of authoritative parenting resulted in placing more importance on extrinsic than intrinsic aspirations, leading to controlled regulation, lower levels of self-esteem, and reduced wellbeing. As permissive and authoritarian parenting were also directly associated with placing more importance on extrinsic than intrinsic aspirations, permissive (indirect effect = -.03, \( p < .05 \), 2.46% variance explained) and authoritarian (indirect effect = -.03, \( p < .01 \), 2.72% variance explained) parenting were also indirectly associated with lower levels of wellbeing.

A second indirect path from authoritarian parenting included a direct relationship with lower OMPI scores (i.e., a greater orientation towards mechanistic than organismic thinking) leading to placing more importance on extrinsic than intrinsic aspirations, controlled regulation, reduced self-esteem, and subsequently lower levels of wellbeing. This indirect path accounted for .92% (indirect effect = -.01, \( p < .05 \)) of the variance in wellbeing.

**Indirect effects from OMPI scores.** There was one significant indirect path from OMPI scores to wellbeing. Higher OMPI scores, indicating higher levels of holism, were associated with placing more importance on intrinsic than extrinsic aspirations (i.e., lower REVO scores), higher levels of autonomous regulation, self-esteem, and subsequent higher levels of wellbeing. This indirect pathway accounted for 6.10% (\( r = .06, p < .001 \)) of the variance in wellbeing.

**MHPI and paternal parenting styles.** In order to compare the performance of the MHPI to the OMPI, the previous model was replicated, with the exception of the MHPI being used instead of the OMPI. The model (see Figure 13) comprised 37 parameters, resulting in a
case to parameter ratio of 6.54:1. The model fit was similar to the model comprising the OMP, $\chi^2(28) = 56.54, p < .01$, CFI = .94, TLI = .91, RMSEA = .06 (90% CI = .04-.09), SRMR = .05.

![Diagram](image_url)

**Figure 13.** Model for paternal parenting styles using the MHPI (with significant paths only; *** $p < .001$, ** $p < .01$, * $p < .05$).
Direct effects. A majority of direct effects were identical to those from the previous model. Direct effects from parenting styles to REVO scores were different, as were those which included the MHPI. Higher levels of authoritative (5.06% variance explained) and authoritarian (2.56% variance explained) parenting were directly associated with higher REVO scores (i.e., placing more importance on extrinsic than intrinsic aspirations). The direct path from permissive parenting to REVO scores was not significant.

Higher levels of paternal permissive (3.61% variance explained) and authoritarian (2.37%) parenting were significantly associated with lower MHPI scores, indicating higher levels of mechanistic thinking. Higher MHPI scores were directly associated with lower REVO scores, (16.16% variance explained) indicating that higher levels of holism were directly associated with placing less importance on extrinsic compared to intrinsic aspirations.

Indirect effects from authoritative and authoritarian parenting. There were two significant indirect paths from authoritative and authoritarian parenting to wellbeing. Higher levels of authoritative (indirect effect = -.04, \( p < .01 \), 3.69% variance explained) and authoritarian (indirect effect = -.03, \( p < .05 \), 2.63% variance explained) parenting were associated with placing more importance on extrinsic than intrinsic aspirations (i.e., lower REVO scores), leading to more controlled regulation (i.e., lower GMS scores), reduced self-esteem, and lower subsequent levels of wellbeing.

Indirect effects from MHPI scores. Higher MHPI scores indicating higher levels of holistic thinking were associated with placing more importance on intrinsic than extrinsic aspirations, leading to higher levels of autonomous regulation, self-esteem, and higher subsequent levels of wellbeing. This indirect pathway accounted for 6.60% (indirect effect = .07, \( p < .001 \)) of the variance in wellbeing scores.
**OMPI and maternal parenting styles.** The same model as used to examine paternal parenting styles was used, with the only change being the inclusion of maternal parenting styles. With 37 distinct parameters and 275 successful completions of the maternal PAQ-S, the case to parameter ratio was 7.43:1. Due to multivariate skewness (Mardia’s coefficient = 12.81), the Robust Maximum Likelihood estimation method was used to adjust the parameter estimate and chi-square statistics for non-normality. The model (see Figure 14) was an adequate fit with the data, $\chi^2(28) = 68.59, p < .001$, CFI = .92, TLI = .90, RMSEA = .07 (90% CI = .05-.09), SRMR = .06. Despite the CFI and TLI indices being below .95, RMSEA and SRMR were indicative of good model fit (see Hu & Bentler, 1999; Kline, 2005). Furthermore, the changes to the model recommended by the modification indices were not theoretically meaningful. Thus, the model was considered suitable for examining the expected direct and indirect relationships.

**Direct effects.** Maternal authoritarian parenting was directly associated with lower levels of holistic thinking (i.e., lower OMPI scores, 3.10% of variance explained). The direct paths from authoritative and permissive parenting to OMPI scores were not significant. Higher levels of authoritarian (2.82% variance explained) and permissive (3.42% variance explained) parenting were directly associated with placing more importance on extrinsic than intrinsic aspirations (i.e., higher REVO scores). While the direct path from authoritative parenting to aspirations was not significant, higher levels of authoritative parenting were directly associated with higher levels of wellbeing, explaining 2.31% of variance.
Higher OMPI scores indicating higher levels of holistic thinking were directly associated with placing more importance on intrinsic than extrinsic aspirations, accounting for 14.67% of variance. Higher REVO scores (i.e., placing more importance on extrinsic than intrinsic aspirations) were directly associated with lower GMS scores (i.e., more controlled regulation), explaining 15.52% of variance. Higher GMS scores accounted for 20.98% of the
variance in self-esteem scores, indicating that higher levels of autonomous regulation were directly associated with higher levels of self-esteem. Finally, higher levels of self-esteem were directly associated with higher levels of wellbeing, accounting for 70.73% of variance.

**Covariances.** Higher levels of maternal authoritative parenting were associated with higher levels of permissive (1.69% variance shared) and lower levels of authoritarian parenting, 2.53% variance shared. Higher levels of authoritarian parenting were also significantly (5.76% variance shared) associated with lower levels of permissive parenting. Higher levels of vitality also shared 12.39% of variance with higher levels of positive affect.

**Indirect effects including parenting styles.** There were no significant indirect pathways from authoritative parenting to wellbeing. Higher levels of permissive and authoritarian parenting were each associated with placing more importance on extrinsic than intrinsic aspirations (i.e., higher REVO scores), leading to controlled regulation (i.e., lower GMS scores), reduced self-esteem, and lower subsequent levels of wellbeing. The indirect path from authoritarian parenting accounted for 2.55% (indirect effect = -.03, \( p < .05 \)), and the indirect path from permissive parenting 2.81% (indirect effect = -.03, \( p < .01 \)) of the variance in wellbeing.

It was also found that higher levels of authoritarian parenting resulted in lower OMPI scores (i.e., higher levels of mechanistic thinking), leading to a greater focus on extrinsic than intrinsic aspirations, controlled regulation, lower self-esteem, and reduced wellbeing. This indirect pathway significantly accounted for 1.02% (indirect effect = -.01, \( p < .05 \)) of the variance in wellbeing.

**Indirect effect from OMPI.** The indirect path from OMPI, including lower REVO scores (i.e., placing more importance on intrinsic than extrinsic aspirations), higher levels of autonomous regulation (i.e., higher GMS scores), and self-esteem, accounted for 5.81%
(indirect effect = .06, $p < .001$) of the variance in wellbeing. Therefore, higher levels of holism were indirectly associated with higher levels of wellbeing.

**MHPI and maternal parenting styles.** The model was modified to replace the OMPI with the MHPI. The model fit was found to be similar to that as the model including the OMPI, $\chi^2(28) = 65.93, p < .001$, CFI = .93, TLI = .90, RMSEA = .07 (90% CI = .05-.09), SRMR = .06. The model, with significant paths only, is displayed below in Figure 14.

**Direct effects.** A majority of the direct effects and covariances between existing variables were identical to the previous model. In the MHPI model, the direct path from permissive parenting to aspirations was no longer significant; however the direct path from authoritarian parenting to aspirations remained the same, accounting for 2.82% of variance. Higher levels of permissive (5.15% variance explained) and authoritarian (4.00% variance explained) parenting where directly associated with lower MHPI scores, indicating that higher levels of each parenting styles were associated with lower levels of holism. Finally, higher MHPI scores were associated with placing more importance on intrinsic than extrinsic aspirations, accounting for 11.42% of variance.

**Indirect effects from parenting styles.** Two separate indirect pathways suggested that higher levels of permissive (indirect effect = -.01, $p < .05$, 1.16% variance explained) and authoritarian (indirect effect = -.01, $p < .05$, 1.03% variance explained) parenting lead to lower MHPI scores, resulting in higher REVO scores (i.e., placing more importance on extrinsic than intrinsic aspirations), lower GMS scores (i.e., more controlled regulation), lower levels of self-esteem, and lower subsequent levels of wellbeing.

Authoritarian parenting was also directly associated with placing more importance on extrinsic than intrinsic aspirations, subsequently leading to controlled regulation, lower levels of self-esteem, and lower levels of wellbeing. This indirect path accounted for 2.55% ($r = - .03, p < .05$) of the variance in wellbeing.
Indirect effects from MHPI scores. There was one significant indirect path to wellbeing, suggesting that higher levels of holistic thinking (i.e., higher MHPI scores) were directly associated with placing more importance on intrinsic than extrinsic aspirations (i.e., lower REVO scores), leading to more autonomous regulation (i.e., higher GMS scores), higher self-esteem, and greater levels of wellbeing. This indirect pathway accounted for 5.13% (indirect effect = .05, \( p < .001 \)) of the variance in wellbeing scores.

Figure 14. Model (with significant paths only) for maternal parenting styles using the MHPI, (*** \( p < .001 \), ** \( p < .01 \), * \( p < .05 \)).
Chapter 23: Study 3 Discussion

There were two primary aims in Study 3. The first was to assess the OMPI and if necessary, develop a revised version of the measure. The second was to investigate the influence of parenting styles on the development of holistic/mechanistic thinking. In particular, it was expected that higher levels of authoritative parenting would be associated with holistic thinking, higher levels of authoritarian parenting with mechanistic thinking, and the relationship with permissive parenting was to be explored. As a result, it was expected that authoritative parenting would be indirectly associated with increased wellbeing, whereas authoritarian parenting was expected to be indirectly associated with lower levels of wellbeing.

Assessment of the OMPI

The analyses indicated that the OMPI provided a poor fitting statistical model. The statistical removal of items which contributed little variance to the model and had previously been identified as being theoretically flawed culminated in the development of an eleven item scale (OMPI-11). Despite comprising two items which had previously been identified as being theoretically flawed, all items contributed an adequate amount of variance to the model and model fit was excellent. The removal of these two items, and a further three items which were deemed to comprise a theoretically unsuitable factor assessing utilitarianism, and the inclusion of nine supplementary items resulted in the 15-item Mechanistic Holistic Paradigm Inventory (MHPI). The MHPI comprised three factors (change, contextuality, relativism) which accord with theory associated with, and contribute to overall levels of, mechanistic and holistic thinking (Gare, 1996; McGilchrist, 2009; see also Nisbett, 2003). The MHPI provided excellent model fit and was consistently found to be more reliable than the original
OMPI and OMPI-11 in the combined samples. The MHPI was also assessed alongside the OMPI and AHS in Sample 2, and as part of the investigation of parenting styles in Sample 1.

**Sample 2 results.** The results in Sample 2 indicated that the AHS was more reliable than the OMPI, and both measures were more reliable than the MHPI, which displayed a higher reliability coefficient than the OMPI-10. The OMPI, OMPI-10, AHS, and MHPI were correlated at moderate to strong levels, indicating that higher scores representing holism on one measure were associated with higher scores on the other measures.

As expected, all four measures were associated with higher RIPO scores, indicating an orientation towards IP rather than DP. The remaining correlations provided mixed evidence for the efficacy of the holistic/mechanistic measures. It was expected that higher levels of holism would be associated with higher scores on collective and lower scores on individual self-construals, a tendency towards having incremental rather than entity lay theories, and a left-wing political affiliation. The relationship with the relational self-construal and holism was to be investigated. In line with expectation, higher scores on the OMPI, OMPI-11, and MHPI, but not the AHS, were associated with higher scores on collective self-construal. There were no significant correlations with individual self-construal, however higher scores on the OMPI-11 and AHS were associated with higher scores on the relational self-construal. This is likely to indicate that a relational self-construal, which involves defining oneself based on relationships with others, accords with the contextual nature of holistic thinking (e.g., Gare, 1996; McGilchrist, 2009; Nisbett, 2003).

Contrary to expectations, only the OMPI and AHS correlated with the entity/incremental lay theory measures (see Dweck 1999; Dweck et al., 1985). Furthermore, higher OMPI and AHS scores (i.e., higher levels of holism) were associated with lower lay theory measure scores (OMPI: on morality, world, and person; AHS: on morality), indicating
a preference for entity rather than incremental lay theories. Finally, neither the OMPI, OMPI-11, AHS, or MHPI were significantly correlated with the measure of political affiliation or nonattachment. In contrast, higher AHS scores were associated with higher levels of nonattachment in Study 2. Thus, the lack of relationships may have been due to the sample used rather than the efficacy of the measures. In addition, the reliability coefficients were generally lower for the OMPI, OMPI-11, AHS, and MHPI in Sample 2 than in the combined samples from Study 3. This may have been the result of the small sample size (Sample 2 \( N = 114 \)), certain characteristics of the sample, or both factors in combination. As a result, further research is required to determine the validity, and if necessary, to refine the measurement, of holistic and mechanistic thinking. Despite this, while the small sample or poor reliability may explain the lack of correlations, it was not expected that higher levels of holism as measured by the OMPI and AHS would be associated with scores representing entity lay theories.

The unexpected correlation between entity theories and holism may have been due to the aforementioned concerns regarding the wording of the entity/incremental lay theory items. For example, there may be variable responses to an item such as, “Though we can change some phenomena, it is unlikely that we can alter the core dispositions of our world” (Dweck et al., 1995). If a holistic person considered that the Earth rotating around the Sun constitutes a core disposition, they may rate this as something which cannot be changed. If ‘world’ is instead interpreted as a synonym for ‘social domain’, a holistic person may believe that certain social norms or values (i.e., dispositions) are malleable and can be altered. This suggests that cultural differences which have been identified using the entity/incremental theorist measures (see Dweck et al., 1995 for a review) may represent differences in the interpretation of items rather than underlying differences in considering contextual factors and relationships, which are components of holistic thinking (Gare, 1996; McGilchrist, 2009; Nisbett, 2003). Further research may thus be required to assess the validity of incremental
and entity lay theories, as they may not sufficiently validate measures of holistic and mechanistic thinking. The second part of Study 3 provided results which were generally in line with expectations.

**Parenting styles, OMPI, and MHPI in Sample 1**

The MHPI was found to be more reliable than the OMPI, which had a greater reliability coefficient than the OMPI-11. Similar to findings from Study 2, the OMPI, OMPI-10 and MHPI were strongly correlated, and were all associated with lower RIPO scores. As expected, the OMPI, OMPI-11, and MHPI were all negatively correlated with the measure of political affiliation, indicating a left-wing political orientation. The three measures were also correlated with higher GMS scores, and lower levels of negative affect. In addition, higher scores on the OMPI-11 and MHPI were also correlated with higher levels of life satisfaction and positive affect, whereas the OMPI, OMPI-11, and MHPI were all associated with reduced negative affect. Thus, it appeared that higher levels of holistic thinking were associated with higher levels of autonomous regulation and wellbeing. The remaining correlations were line with findings from Studies 1 and 2. The results of the structural equation models provided mixed support for the hypotheses.

As expected, higher levels of holistic thinking (i.e., higher OMPI and MHPI scores) were consistently associated with placing more importance on intrinsic than extrinsic aspirations (i.e., lower REVO scores). In combination with findings using the AHS in Study 2, the results from Study 3 provide additional support for the argument that higher levels of mechanism are associated with emphasising extrinsic aspirations (Gare, 1996; McGilchrist, 2009). Furthermore, and in accordance with findings from Studies 1 and 2, placing more importance on intrinsic than extrinsic aspirations was directly associated with more autonomous regulation (i.e., higher GMS scores). Higher levels of autonomous regulation,
were associated with higher levels of self-esteem, and higher levels of self-esteem were directly associated with wellbeing. Thus, as expected, higher levels of holism were indirectly associated with increased wellbeing. Wellbeing was also found to be significantly comprised of higher levels of vitality, life satisfaction and positive affect, and lower levels of negative affect. The indirect paths including parenting styles however, were not entirely as expected.

The models indicated that higher levels of maternal and paternal authoritarianism were directly associated with lower OMPI and MHPI scores. Maternal and paternal permissive parenting was only associated with lower MHPI scores, and direct paths from maternal and paternal authoritative parenting to OMPI and MHPI scores were not significant. Thus, there was consistent support for higher levels of maternal and paternal authoritarian parenting leading to mechanistic thinking (i.e., lower OMPI and MHPI scores), and some support for permissive parenting leading to mechanistic thinking (i.e., lower MHPI scores). The results for authoritarian parenting accord with the belief that authoritarian parenting, which may uphold the status quo by encouraging acquiescence to established authority (Baumrind, 1971), may result in an adherence to the dominant mechanistic metaphysics of Western society (e.g., Gare, 1996; McGilchrist, 2009). For permissive parenting, in which there are few rules or restrictions provided by one’s parents (Baumrind, 1966, 1971, 1972), children may unquestioningly adopt mechanistic norms as they are the ‘normal’ way in which to engage with the world. That is, when provided with the opportunity to seek out any way of living without restriction, perhaps mechanistic norms are adopted as they are the most prevalent or accessible. The lack of relationship between authoritative parenting and OMPI or MHPI scores is potentially more complex.

Authoritative parenting may provide people with the ability to question mechanistic societal norms. In addition, authoritative parenting provides a framework through which to explore the world in a mature way, and a parental tendency to explain why rules and
regulations exist and how breaking them affects others (Baumrind, 1966, 1971, 1972). This may result in holistic thinking by creating a contextualised, ‘big picture’ understanding of how aspects of life are related. This does not infer however, that all people from authoritative parental backgrounds will question mechanistic norms. It also does not suggest that those who question mechanistic norms will reject them or adopt holistic perspectives. Thus, some people from authoritative backgrounds may be mechanistic whereas others become holistic. This may explain the lack of a significant direct relationship between authoritative parenting and OMPI or MHPI scores. It may be important to examine parental levels of holism and mechanism, in addition to epistemic style. The findings in Study 2 suggested that an orientation towards IP than DP was associated with greater holism. It may be the case for example, that individuals from authoritative backgrounds who are higher in IP than DP may be more likely to develop higher levels of holism.

Contrary to the belief that authoritarian parenting would be directly associated with controlled regulation and authoritative parenting with autonomous regulation (e.g., Grolnick et al., 1997; Grolnick & Ryan, 1989; Keller, 2008; Patock-Peckham et al., 2001; Vallerand & Bissonnette, 1992), the models were modified as there were no significant direct relationships between parenting styles and regulation. The models were modified so that parenting styles were directly associated with aspirations. As indirect effects from parenting styles to wellbeing involved both aspirations and regulations, it indicated that parenting styles were indirectly associated with regulation. In accordance with expectations, the results indicated that permissive and authoritarian parenting were indirectly associated with higher levels controlled regulation (i.e., lower GMS scores), as a result of lower levels of holistic thinking and placing more importance on extrinsic than intrinsic aspirations. Contrary to expectations, similar results were obtained for paternal authoritative parenting. In the MHPI and OMPI models assessing the influence of paternal parenting styles, higher levels of authoritative
parenting were associated with placing more importance on extrinsic than intrinsic aspirations (i.e., higher REVO scores), leading to more controlled regulation (i.e., lower GMS scores), lower self-esteem, and lower wellbeing. This suggests that all paternal parenting styles encourage the pursuit of extrinsic rather than intrinsic aspirations, leading to controlled regulation. Therefore, in a consumer culture (e.g., Dittmar, 2007; Gare, 1996; Kasser & Ryan, 1993, 1996; McGilchrist, 2009), even authoritative parenting may encourage extrinsic goals (e.g., get a good job to buy a nice house) as part of a ‘normal’ life, which can result in controlled regulation (i.e., a sense that such goals must be attained in order to meet the expectations of others). While a comparatively greater focus on extrinsic than intrinsic aspirations and controlled regulation were indirectly associated with reduced wellbeing, in the maternal and paternal parenting models, authoritative parenting was directly associated with higher levels of wellbeing. Thus, as suggested by Baumrind (1966, 1971, 1972) and Deci and Ryan (1985), authoritative parenting is likely to result in better outcomes. However, on the basis of the current study, it is unclear how authoritative parenting may result in higher levels of wellbeing. The inconsistent relationship between authoritative parenting and OMPI/MHPI scores suggests that a range of other factors could be considered in future research.

Considerations for future research

The inconsistent relationships with maternal and paternal permissive parenting, and the lack of relationship with maternal and paternal authoritative parenting with OMPI and MHPI scores, suggests that other types of relationships (e.g., peer, romantic, and workplace relationships; Collins, Gleason, & Sesma Jr., 1997) may need to be considered as influences on personal levels of holism or mechanism. In addition, epistemic style and parental levels of holism/mechanism as mentioned earlier, may be required to explain how parenting styles influence the development of holistic or mechanistic thinking.
Furthermore, to further understand the relationship between parenting styles, aspirations and regulation, it may be worth ascertaining parental levels of extrinsic aspirations and materialism (see Csikszentmihalyi & Rochberg-Halton, 1981; Kasser et al., 1995). For example, there may be differences between individuals who have authoritative parents that emphasise extrinsic aspirations, and those who have authoritative parents that emphasise intrinsic aspirations. This may be useful in understanding the interpersonal antecedents which may underlie the development of holism and mechanism.

Future research could also consider collecting qualitative data. Such a focus could be informed by narrative psychology, in which participants’ are asked to provide information pertaining to key life episodes (i.e., earliest memory, high points, important adulthood experience), main characters (i.e., influential people), and questions relating to how particular values and beliefs (i.e., religious and political beliefs) have evolved over the lifespan. This may also provide the ability to distinguish between those who are mechanistic or holistic, as previous research has found life narratives of Americans to be more self-focussed than those of Asians (Wang, 2001). As correlations in the current study found that holism is associated with having a greater collective self-construal, it may be that holistic individuals have broader, more socially-minded life narratives than mechanistic individuals. In addition, similar to the indirect relationship between holism and self-actualization in Study 2, and the theoretical link between self-actualization and ego development, narrative complexity is associated with higher stages of ego development (McAdams, 1993).

The additional benefit of understanding key life events is that they may contribute to increases in holism. For example, Sahdra et al. (2010) suggest that nonattachment can increase through the lifespan as a result of influential life experiences (i.e., death of a loved one, birth of a child, losing one’s job). Furthermore, Grouzet (2013) has suggested that while human beings have evolved to seek intrinsic aspirations, social pressures can result in a
primary focus on extrinsic aspirations. Major life events, such as those suggested by Sahdra et al. (2010), may provide the means to reconsider one’s life and to shift one’s focus back towards intrinsic aspirations (Grouzet, 2013). This process may enable the development of holistic thinking, or may be more likely to occur, or have a larger influence, on those who are already holistic. An awareness of these factors may be enhanced by qualitative assessment. Qualitative assessment however, may be time consuming and costly. Thus, there are still benefits in quantitative measures, providing that they are a valid assessment of holism/mechanism.

**Implications for the measurement of holistic and mechanistic thinking**

The correlational findings from Study 3 provided mixed support for the efficacy of the OMPI, OMPI-11 and MHPI. The correlations did not provide strong evidence for the superiority of any one of these measures, however the correlations (in addition to reliability coefficients) suggested that the original OMPI performed better than the OMPI-11. Importantly, the MHPI is more theoretically sound than the OMPI as it assesses three underlying factors representing holistic and mechanistic thinking (e.g., McGilchrist, 2009; Nisbett, 2003; Peng & Nisbett, 1994) rather than a range of philosophical (e.g., ontological, epistemological, methodological) and practical (e.g., parenting, relationships, legal matters) areas chosen by Johnson et al. (1988). Accordingly, the MHPI was generally found to be more reliable than the OMPI, and also provided superior model fit. While both measures provided similar results in structural equation models used to assess maternal and paternal parenting styles, the MHPI is shorter than the OMPI (15 items compared to 26 items). This can result in faster completion rates and less participant fatigue or boredom which can result in inaccurate responding. Despite this, if the MHPI is a better alternative to the OMPI, it must be compared further against the AHS, as the results from Sample 2 (N = 114) were not sufficient to provide adequate comparisons.
Conclusion

Overall, despite concerns with measurement, the findings of this study provide further evidence to suggest that underlying holistic or mechanistic metaphysical perspectives may play an important role in influencing the types of goals and aspirations individuals choose in life, and the subsequent influence these can have on regulation, self-esteem and wellbeing. Furthermore, the relationships with maternal and paternal authoritarian, and paternal permissive parenting, with holistic and mechanistic thinking provide some evidence that these perspectives may develop as part of early, formative experiences. Further research is required to explicate a wider range of antecedent factors.
Chapter 24: Conclusions

This thesis started as an exploration of the psychological reasons underlying the development of intrinsic and extrinsic aspirations and consumer materialism. In addition, outcomes such as regulation, self-esteem and their influence on wellbeing were investigated. This commenced with an examination of epistemic style before moving towards an investigation of the related, but broader and more encompassing concepts of holistic and mechanistic thinking. In addition to being described in a range of cogent, convergent theories (see Gare, 1996; McGilchrist, 2009; Nisbett, 2003; Pepper, 1942), the results from Studies 2 and 3 indicated that holistic and mechanistic thinking, which have hitherto been unexplored in research on aspirations, regulation, materialism, or wellbeing, have the potential to be important constructs worthy of additional research. Each study will be briefly summarised before discussing the overall conclusions obtained from this research.

Study 1

The rationale underlying the first study was that individuals who are more complex in their thinking (i.e., Intellective rather than Default Processors; Eigenberger et al., 2007) may question and reject the normative extrinsic, materialistic values typical of a consumer culture (see DeBord, 1995; Dittmar, 2007; Fromm, 1976/2005; Kasser & Ryan, 1993, 1996), and instead choose to focus more on intrinsic aspirations. It was also expected that a greater focus on intrinsic than extrinsic aspirations would be associated with lower levels of materialism, in addition to more autonomous regulation, greater satisfaction of basic psychological needs and self-esteem, and higher subsequent levels of wellbeing (i.e., life satisfaction, vitality, and reduced depression). The influence of income was also investigated.

As expected, the SEM results indicated that higher comparative levels of Intellective than Default Processing (i.e., higher RIPO scores) were indirectly associated with higher
levels of wellbeing as a result of placing more importance on intrinsic than extrinsic aspirations (i.e., lower REVO scores), lower levels of materialism, higher levels of autonomous regulation, basic psychological need satisfaction, and self-esteem.

In accordance with the notion that wealth can be a quantifiable means of judging how successful one is in life (e.g., Dittmar, 2007; Fromm, 1976/2005; Kasser & Ryan, 1993, 1996), and that increased wealth can enable freedom and security (e.g., Aknin et al., 2009; Kahneman & Deaton, 2010; see also Aristotle, 1954; Maslow, 1968), and the ability to pursue meaningful experiences (e.g., Dunn & Aknin, 2008; Guevarra & Howell, 2014; Howell et al., 2012; Van Boven & Gilovich, 2003), higher incomes were directly associated with greater self-esteem and greater satisfaction with basic psychological needs, and thus indirectly associated with increased wellbeing. Income was also directly associated with lower levels of depression. Higher levels of materialism and placing more importance on extrinsic than intrinsic aspirations however, were involved in indirect paths to reduced wellbeing, due to their direct relationships with reduced basic psychological need satisfaction, for example. Thus, in accordance with research which has suggested that money is not inherently detrimental to wellbeing (e.g., Carver & Baird, 1998; Garðarsdóttir et al., 2009; Srivastava et al., 2001), it is the extrinsic reasons which motivate why someone might want money rather than money itself, which results in low levels of wellbeing.

Additional interesting findings from Study 1, which spurred the investigation into holistic and mechanistic thinking, were the results pertaining to age. Increased age was directly associated with placing less importance on extrinsic compared to intrinsic aspirations. This was in accordance with Kasser and Ryan (1993, 1996) who found that older respondents reported placing less importance on extrinsic aspirations than younger respondents. Interestingly, increased age was found to have a direct negative relationship with epistemic style (i.e., RIPO) scores, indicating that older respondents were more likely to
have an orientation towards DP rather than IP. This provided a slightly paradoxical conclusion, in that an orientation towards DP than IP was directly associated with a greater focus on extrinsic aspirations, indirectly leading to lower levels of wellbeing. Yet older people, who were higher in DP, generally placed more importance on intrinsic aspirations, which indirectly resulted in higher levels of wellbeing. This result may have been the result of generational differences. For example, Twenge et al. (2010) suggest that more recent generations emphasise the importance of extrinsic aspirations to a greater extent than older generations. Thus, older people may believe that intrinsic aspirations are more important than extrinsic aspirations, and that this is the ‘normal’ way to live which does not require complex thought (i.e., DP). Accordingly, increased age was directly associated with greater wellbeing. In accordance with theory from Gare (1996) and McGilchrist (2009) however, it was believed that there may be a fundamental metaphysical reason (i.e., higher levels of holistic thinking) which may explain why society emphasises extrinsic, materialistic values, and which may also be a better indicator of why people choose to focus on extrinsic or intrinsic aspirations than epistemic style.

Study 2

The second study commenced an investigation into holistic and mechanistic/analytic thinking. In particular it was expected that higher levels of holism would be indirectly associated with higher levels of wellbeing. In accordance with expectations, higher levels of holism were directly associated with higher levels of nonattachment and placing more importance on intrinsic than extrinsic aspirations, leading to lower levels of materialism, higher levels of autonomous regulation, increased self-esteem and higher subsequent levels of wellbeing. A second model found that higher levels of holism were indirectly associated with higher levels of self-actualization. These models also indicated that age and higher RIPO scores (i.e., a greater orientation towards IP than DP) were also indirectly associated with
higher levels of wellbeing. A third model indicated that self-esteem was associated with higher levels of self-actualization, but only self-esteem was directly associated with higher levels of wellbeing.

Contrary to findings from Study 1, a direct path from age to RIPO was not significant. Thus, epistemic orientation towards either IP or DP was not related to age. The model also indicated that older respondents reported higher levels of holism. Longitudinal study may be required to determine whether this is indicative of generational differences (e.g., Twenge et al., 2010) or whether holism may increase throughout one’s life as a result of meaningful or influential life experiences (e.g., Grouzet, 2013; Sahdra et al., 2010).

Despite the result generally being in line with expectations, it was deemed necessary to replicate the findings from Study 2 using the OMPI (Johnson et al., 1988), as there may be theoretical concerns with the AHS (Choi et al., 2007). In particular, the AHS may be culturally biased and assess Western and Eastern cultural differences rather than inherent differences in holistic thinking. Due to theoretical concerns with the OMPI related to face and content validity however, another aim of the third study was to consider developing a revised measure. In addition, it was decided to examine parenting styles as a potential means through which holistic or mechanistic thinking may develop.

Study 3

The findings of the third study indicated that the MHPI may provide a better measure of holistic and mechanistic thinking than the OMPI. While both measures appeared to perform similarly, the MHPI was more reliable and is also a shorter measure. With the exception of the correlation results from Sample 1, results were generally in line with expectations.
The SEM results indicated that as expected, higher levels of holism as measured by both the MHPI and OMPI, were indirectly associated with increased wellbeing as a result of direct relationships with higher levels of importance on intrinsic than extrinsic aspirations, which lead to more autonomous regulation and greater self-esteem. As expected, the results also consistently indicated that higher levels of maternal and paternal authoritarian parenting were directly associated with mechanistic thinking. The models using the MHPI also suggested that permissive parenting leads to mechanistic thinking (i.e., lower MHPI scores).

There was also some support in Studies 2 and 3 for higher levels of mechanism to be associated with a right-wing political affiliation, whereas holism is associated with left-wing political affiliations. While this is consistent with theories provided by Gare (1996) and McGilchrist (2009) and validates the OMPI and MHPI, further research is required to investigate the relationships between holistic/mechanistic thinking and specific ideological beliefs. For example, to determine if there are differences in holism/mechanism between people who have beliefs and values according with modern liberal compared to neoconservative ideological backgrounds.

Implications

Overall, the findings from the three studies indicated that the measurement of holistic and mechanistic thinking is a potentially fruitful area of future research. First, the results from the studies undertaken in this thesis suggest that holistic/mechanistic thinking can be used to understand the types of goals and aspirations people are likely to value in life, and how these may subsequently influence outcomes such as wellbeing. Despite being a unique contribution to psychological research, further research is required to ensure the efficacy of the measurement of holistic/mechanistic thinking. It is believed that the accurate assessment of holistic and mechanistic thinking will have applications in a range of research and practical
domains. In particular, in providing insight into the political, social, economic, and environmental values people have in life.

**Politics and moral psychology.** Haidt and colleagues (see Haidt, 2012 for a review) have identified six domains which represent the moral beliefs which influence political values; care/harm, liberty/oppression, fairness/cheating, loyalty/betrayal, authority/subversion, and sanctity/degradation. Some of these moral domains may arise from underlying levels of holistic or mechanistic thinking. For example, the care/harm domain pertains to how much one feels that society should care for all people (a potentially holistic view) or simply to those who are part of our respective in-groups (potentially more mechanistic). Similarly, the fairness/cheating domain has hallmarks of the fundamental attribution error (Ross, 1977). For example, whether people on welfare as seen as cheating the system because they are lazy (i.e., a mechanistic perspective which does not consider contextual factors) or deserving of welfare as they may have befallen negative extenuating circumstances (i.e., a broader, holistic perspective; see Nisbett, 2003 for a review).

Haidt (2012) suggests that these moral domains explain the animosity towards Wall Street arising from the Global Financial Crisis by those with a left-wing political affiliation. These individuals believed that the amount of money being earned by Wall Street executives was not fair as they were earning far more money than their contribution to society warranted, and that the resulting disparity in wealth between rich and poor ensures that all people are not cared for. This viewpoint may be indicative of a holistic perspective. In contrast, right-wing individuals, potentially as a result of having committed the fallacy of misplaced concreteness and reifying the importance of money (Gare, 1996; see also DeBord, 1995; Fromm, 1976/2005) felt that the Occupy Wall Street protests were indicative of socialism. That is, ‘the left’ was seen to comprise individuals wanting money which rightfully (e.g., the fairness/cheating domain) belonged to those who were self-evidently
more productive and hardworking than the rest of society, indicated by their high levels of wealth. Thus, anyone who is poor is deserving of harm and should improve their work ethic rather than expect charity. This view, which emphasises individual effort and the reification of wealth, may be more indicative of a mechanistic perspective.

Such holistic/mechanistic perspectives and moral considerations may manifest in ideological values or beliefs. For example, the mechanistic individual who believes that fairness equates to rewards consummate with the amount of individual effort applied, may be likely to endorse neoliberal, neoconservative, or libertarian ideological perspectives. The holistic individual who believes that all people are deserving of a level of welfare and that society should aspire to be as equal as possible, may thus endorse modern liberal or social democratic ideological preferences (see Gare, 1996; Heywood, 2007; McGilchrist, 2009). This is also consistent with the finding from Study 3 that higher levels of holism were associated with a more left-wing political orientation. Therefore, further research could investigate whether holistic and mechanistic thinking are associated with moral domains (see Haidt, 2012), and whether they can also predict political support for particular candidates or parties, or support for particular issues. This knowledge may enable political parties to communicate their policies more effectively. For example, if mechanistic rather than holistic individuals primarily provide opposition to policies pertaining to climate change, it may be important to communicate policies in a way which emphasises mechanistic aspects or concerns (e.g., economic concerns, the number of jobs which increased funding in the renewable energy sector will create).

**Social concerns.** The extent to which individuals are mechanistic or holistic may also influence individual and social wellbeing. Findings from Studies 2 and 3 suggested that higher levels of holism may be indirectly associated with higher levels of personal wellbeing. Higher levels of holism may also benefit society as a whole.
It has been suggested that human beings have evolved to be social animals as it provides the best means of survival (Darwin 1871/1981; Koeslag, 1997; Wynne-Edwards, 1962). Accordingly, relatedness is a basic psychological need (Bowlby, 1968; Deci & Ryan, 1985, 2000), a prerequisite for eudaimonia (Aristotle, 1954), a necessary component of the Maslovian need for love and belonging (Maslow, 1968), and isolation is an antecedent of depression (Baumeister & Leary, 1995). The purely mechanistic conceptualisation of the self and others as individual entities, defined by internal characteristics rather than influenced by social, cultural, economic, and historical contexts (see Hegel, 1830/1991, 1830/1970, 1830/1971, 1821/2001; Herder, 1765-1797/2004), is one in which Machiavellian competition is emphasised (Gare, 1996; McGilchrist, 2009). Differences in Machiavellian individualism and the empathic treatment of others have been observed in games such as the Prisoner’s Dilemma.

Axelrod (1990) described a competition in which people submitted computer programs to partake in the Prisoner’s Dilemma. The Prisoner’s Dilemma is a game in which larger rewards are given to those who secretly choose to take advantage of others, providing others have chosen to cooperate. For example, if three people choose to cooperate and one person chooses to take advantage of them, the three co-operators receive nothing and all rewards go to the individual who chose to exploit them. If all people choose to take advantage of others, everyone receives nothing. If everyone chooses to cooperate, everyone is rewarded, but to a lesser extent than taking advantage of those who have unwittingly chosen to cooperate. Axelrod found that the most self-interested programs which seek to take advantage of others tended to fare poorly. Tit For Tat (TFT), a program which is completely reciprocal and co-operative, and will only seek to exploit another program if it has taken advantage of TFT, is consistently the best performer. Axelrod also described versions of the game which proceed in generational iterations. At the end of the round, the worst performing
program is removed, and the process replicated. TFT consistently wins in this ‘survival of the fittest’ contest. Orbell, Morikawa, and Allen (2002) in a similar simulation study found that cooperative rather than competitive programs resulted in the most successful ‘societies’ over time (see also Koeslag & Terblanche, 2003). Therefore, greater benefits are likely to occur at societal and individual levels, if people choose to cooperate rather than to compete.

In Studies 2 and 3, lower AHS, OMPI and MHPI scores (i.e., higher levels of mechanism) were associated with a tendency to place more importance on extrinsic aspirations. Sheldon et al. (2000) found that more extrinsically motivated individuals were less likely to cooperate when participating in the Prisoner’s Dilemma game. When placed into groups comprised of their friends, extrinsically motivated individuals tended to attain fewer points than more cooperative participants. The extrinsically motivated participants tended to have extrinsically motivated friends, and thus attempted to exploit each other, resulting in fewer rewards. When there were cooperative, intrinsically motivated participants to exploit, extrinsically motivated participants tended to attain higher rewards. Therefore, an optimal society in which the largest number of people are likely to succeed, is one in which cooperation is emphasised rather than self-interested competition.

Research using similar experimental paradigms to the Prisoner’s Dilemma in which there are opportunities for mutual gain but also scope for exploitation, has found that individuals are willing to punish exploitative others, even at personal expense (Fehr & Gächter, 2002). Thus, individuals are willing to act against their self-interest in order to punish a member of the group deemed to have behaved inappropriately. Despite this, American participants often utilise self-interested approaches over those that benefit group harmony (Henrich et al., 2005). Indigenous non-Western societies which are based on communal farming practices (i.e., potentially more holistic) rather than market economies (i.e., potentially more mechanistic; see Gare, 1996; McGilchrist, 2009), are more likely than
Westerners to provide fairer offers and to accept offers to avoid conflict (Henrich et al. 2010). These findings accord with those of Nisbett and colleagues (see Nisbett, 2003 for a review) which indicated that Asians tend to be more holistic and focussed on one’s group than more analytic, self-interested American participants. These findings are also in line with the theory of Gare (1996) and McGilchrist (2009) which argues that mechanistic thinking has become preeminent in contemporary Western civilisation.

The benefits of cooperation and fairness are further highlighted by the tragedy of the commons (Hardin, 1968). That is, if everyone cooperates by sharing a common resource, everybody gains. If one person or a small group of people take more than their fair share and exhaust the resource, while they may enjoy short-term benefits, everyone receives less in the long run. Sheldon and McGregor (2000) created a game in which each participant represented a logging company. In each in-game year participants could choose to cut down a number of trees, knowing that the trees would grow back at a certain rate. If a participant cut down a lot of trees they would make larger short-term profits but at the risk of deforestation. Groups comprising highly materialistic individuals tended to seek higher profits, resulting in faster deforestation which diminished the profitability of their own business and those of other participants. A group comprising participants with lower levels of materialism remained profitable for much longer by avoiding deforestation. Thus, in comparison to striving to maximise personal gains, cooperation, or at least acting in a way which does not disadvantage others for the sake of personal gain, may have fewer immediate benefits, and those benefits may be smaller. Greater long-term benefits for the majority of people are more likely to occur from cooperation and consideration for others.

Therefore, research on cooperation and competitiveness may benefit from the inclusion of holistic/mechanistic as an addition insight into who is more likely to be competitive for example, and why this is the case. In addition, creating conditions within
organisations which minimise mechanistic outlooks may yield higher levels of cooperation, for example. Higher levels of holism may also contribute to greater social equality, and in turn greater individual and societal wellbeing.

**Social and economic equality.** Gare (1996) and McGilchrist (2009) suggest that mechanistic thinking emphasises social Darwinism as a result of focussing on individualism and extrinsic outcomes as measures of importance. That is, those who can make more money are the ‘fittest’ in society, and poverty is evidence of inferiority. Furthermore, as mechanism tends not to consider contextual factors, which is generally associated with holism (e.g., Choi et al., 1999; Nisbett et al., 2001; Nisbett & Masuda, 2003; Peng & Nisbett, 1999), social and cultural factors which may provide barriers to success (e.g., racial discrimination, lack of access to education or social resources) may not be considered.

In accordance with the fundamental attribution error (Ross, 1977), in a culture which has normalised self-interest and economic rationalism (Gare, 1996; McGilchrist, 2009; Miller, 1990), it is unlikely that resources will be dedicated to those who are deemed to be in poverty as a result of internal characteristics (e.g., laziness) rather than contextual factors. Furthermore, future developments, such as government policy, may be those that emphasise individual economic self-striving rather than attempting to ensure equality by focussing on reducing issues associated with intervening contextual factors. This is concerning, as poorer individuals within societies with high economic inequality are at greater risk of low self-esteem, higher levels of materialism, in addition to higher rates of crime, obesity, infant mortality, and mental illness, and lower levels of high school completion (see Wilkinson & Pickett, 2010 for a review). Ensuring that society comprises people with lower levels of mechanism and higher levels of holistic thinking may be required to address the underlying contextual issues resulting in greater economic equality, which may have the capacity to reduce negative outcomes such as higher crime (Wilkinson & Pickett, 2010). Thus, in
addition to promoting individual wellbeing as found in Studies 2 and 3, higher levels of holism may also encourage greater levels of equality, promoting societal wellbeing. In addition, it is believed that greater holism may be of benefit in business and economic domains.

**Economic and operational benefits.** Hampden-Turner and Trompenaars (1993) administered a questionnaire to approximately 15,000 managers as part of business seminars, in organisations from a range of countries including the United States of America, Britain, Japan, France, Germany, Sweden and the Netherlands. Similar to research identifying East Asians as holistic and Americans as analytic (see Nisbett, 2003 for a review), Hampden-Turner and Trompenaars (1993) found that Japanese and Singaporean managers tended to view their organisations as being similar to organisms (i.e., a holistic view emphasising all people connected as part of a broader whole), whereas American, British, and Australian managers viewed organisations as machines (i.e., a mechanistic view that people are separate parts which constitute a whole, and can be hired or fired at will). German managers appeared to have a concurrently organismic and mechanistic view, considering their organisations as machines which operate as complex systems. Responses to a number of other questions provide support for a holistic/mechanistic dichotomy, particularly between American and Asian managers.

American managers were more likely to believe that they are more volitional and self-driven than Asian managers who felt that they were guided by external forces. American managers were also more likely than Asian managers to desire employees who were self-driven, and to prefer jobs in which personal efforts are encouraged and rewarded rather than focussing on how the group works as a whole. Furthermore, in accordance with the mechanistic tendency to not consider context and the fundamental attribution error, a greater proportion of American managers believed that success and respect is the direct result of hard
work (i.e., dispositional characteristics) than Japanese or Korean managers. In addition, Western managers were also more likely than Asian managers to see the past, present, and future of the company as being completely separate, rather than intertwined (Hampden-Turner & Trompenaars, 1993). These mechanistic and holistic differences in management styles can be detrimental to economic success.

Systems theorists such as Senge (2006) have suggested that viewing an organisation as a complex, interconnected process which exists in a dynamic, ever-changing world is necessary for success. This view is akin to process philosophy (Whitehead, 1929, 1938; see also, Gare, 1996) and various holistic viewpoints (e.g., Dweck et al., 1995; McGilchrist, 2009; Nisbett, 2003). Senge (2006) suggests that it is important for all departments within an organisation to be in constant communication; no department exists as an independent entity whose work is entirely separate from the work of all other departments. An example of the importance of seeing business as comprising interconnected entities rather than separate parts is shown through the beer distribution game (Sterman, 1989). This game places participants in one of a number of roles; the retailer (i.e., owner of the store that sells the beer), the wholesaler who sells the beer to the store, the distributor that sells the beer to the wholesaler, and the brewer that produces the beer which is sold to the distributor. The aim for the participants, who are not allowed to directly communicate with each other, is to minimise costs whilst maximising profit. The game runs for 36 in-game weeks.

At the beginning of the game, customer demand starts at four cases of beer per week. This creates an initial equilibrium in which participants in each role order or produce the right amount of beer to meet demand. In the fifth in-game week there is a sudden increase in customer demand to eight cases per week. As participants are not allowed to directly communicate, this demand is only known to the retailer. The wholesaler for example, only knows that there is an increase after one additional in-game week, which is when they receive
their order for beer from the retailer. There is an additional one-week delay in when the
distributor finds out there is an increase in demand from the wholesaler, and another week
until the brewer finds out from the distributor that demand has increased. This creates a
delayed feedback system, in which current decisions are affected by current situations, which
are the outcomes of previous decisions. This tends to result in an amplification effect, in
which there is a great imbalance in the amount of beer being produced or held in inventory
(Sterman, 1989).

For example, the retailer first increases their order to eight cases, which cannot be
fulfilled due to deficits in the amount of beer in the supply chain. Despite the demand for beer
remaining at a constant of eight cases per week, to fulfil backorders, the retailer may increase
the number of cases of beer that are ordered. This creates a flow-on effect in which the
number of orders from the wholesaler and distributor are increased, leading to an increase in
the amount of beer produced by the brewer to fulfil the growing backlog of unfilled orders.
This can, by approximately week 20, result in an average of 32 cases of beer per week being
ordered from and produced by the brewer. This then creates a surplus of beer in the supply
chain, with the distributor’s warehouse containing more cases of beer than needed, and the
wholesaler and retailer receiving more beer as a result of previous orders than is actually
required (Sterman, 1989). Similar to the finding that American managers tend to feel that
they are self-driven rather than influenced by external factors (Hampden-Turner &
Trompenaars, 1993), Sterman (1989) noted that a majority of participants in the beer game
(recruited from an economics program in an American university) expressed feeling
frustrated that they had little control and were instead influenced purely by uncontrollable
external factors. Participants also generally believed that customer demand was variable, and
that the backlog of unsellable beer was the result of a sudden decrease in customer demand.
As Senge (2006) suggests, problems occur within the game when participants fail to consider broader, dynamic contextual factors (i.e., not being holistic).

In the case of the beer distribution game, the lack of contextual awareness is contrived as participants are not allowed to directly communicate. In the real world for example, the wholesaler might directly speak with the retailer to ascertain why there has been a sudden increase in demand, and whether this increase will be sustained or might be a random, momentary increase. Senge (2006) suggests however, that lacking contextual awareness can affect businesses which choose to outsource work or decrease their workforce, for example. These changes to the organisation might reduce costs, but may also decrease the quality of the product or overall employee morale, which may also reduce efficiency, or the quality of work being produced. These outcomes might then lead to consumers choosing to buy a better quality product from a competitor, making the company less profitable than when the decision to outsource work was first made. Thus, a mechanistic approach (i.e., viewing expenditure and potential profit in isolation of the marketplace and employee and consumer needs) may lead to less profitable outcomes than a holistic perspective which aims to understand latent feedback systems by considering contextual factors (Senge, 2006).

Senge (2006) also explains that the development of more holistic perspectives is important for management staff. This is the normal process in Japanese and German companies (recall that Japanese and German managers are more likely to view their organisations as complex systems; Hampden-Turner & Trompenaars, 1993). In these countries, new management staff spend time in each department of an organisation before commencing their official management role. By understanding each department and how they contribute to the broader whole, every higher-level management decision is based on an awareness of how it will affect lower levels of the organisation (Senge, 2006). Block (2003) also suggests that a holistic management style is important to create dynamic organisations
that can adapt with changes in the marketplace and also create inspiring, meaningful working environments. Such environments may be more likely to yield creativity and new ideas, which can sustain the profitability of an organisation into the future. In addition, positioning an organisation as an entity which can make a difference to a community or to people’s lives (i.e., intrinsic aspirations; Grouzet et al., 2005; Kasser & Ryan, 1993, 1996) creates a more meaningful rationale for work (i.e., autonomous regulation) than pursuing instrumental outcomes such as profit (i.e., extrinsic aspirations and controlled regulation). In accordance with findings from Studies 1, 2, and 3, which implicated a focus on intrinsic aspirations and autonomous regulation with greater wellbeing, research has found that those who have a meaningful passion or interest in a particular career or type of work (i.e., a ‘calling’; Dobrow & Tosti-Kharas, 2011) tend to be happier (Dik & Duffy, 2008; Peterson, Park, Hall, & Seligman, 2009), more engaged (Van Zyl, Deacon, & Rothmann, 2010), and more committed and satisfied in their work than those who work primarily for wealth, material gain, or career enhancement (Dobrow & Tosti-Kharas, 2011; Duffy, Bott, Allan, Torrey, & Dik, 2012; Duffy, Dik, & Steger, 2011; Peterson et al., 2009; Wrzesniewski, McCauley, Rozen, & Schwartz, 1997). In contrast, Block (2003) argues that viewing employees as resources from which to extract value, and the marketplace as a static, unchanging environment, with a focus on instrumental outcomes (i.e., mechanistic views; Gare, 1996; McGilchrist, 2009), is likely to result in long-term problems for the organisation itself. For example, the extra financial and interpersonal costs associated with high levels of employee turnover.

In addition, as suggested by Gare (1996) and McGilchrist (2009), and alluded to by the research of Sheldon et al., (2000), the mechanistic tendency to exploit resources for personal gain rather than a cooperative focus on the greater good (e.g., tragedy of the commons; Hardin, 1968) may result in greater levels of social and economic inequality, creating a less desirable society for all people to live in (Wilkinson & Pickett, 2010). It may
thus be important for individuals, businesses, and society in general, to as McGilchrist (2009) argues, find a greater balance between mechanistic and holistic perspectives, by shifting towards a more holistic way of thinking overall. This may occur as a result of reducing authoritarian parenting and values (see the results of Study 3), but also ensuring that selection and promotion practices within organisations place value on candidates with holistic rather than mechanistic perspectives.

To provide further evidence for the importance of holistic thinking, future research could replicate the forestry study of Sheldon et al. (2000), the beer distribution game (Sterman, 1989), with conditions in which the game is played by people who are predominantly holistic or mechanistic. Future research could also assess the levels of holistic and mechanistic thinking in successful managers from around the world who run companies which are both profitable and have highly satisfied employees. That is, if contemporary Western society is dominated by mechanistic thinking as suggested by Gare (1996) and McGilchrist (2009), it is important to show the practical benefits of holism which may appeal to, and influence, those whose current mechanistic perspectives are considered to be the most natural, or superior, ways of conceptualising the self, other people, and society in general. Greater levels of holistic thinking may also be of benefit to the university education system and the environment.

**Education.** There is increasing need within many universities to enhance student engagement in order to improve student outcomes such as retention, persistence, and course completion (Astin, 1999; Bradley, Noonan, Nugent, & Scales, 2008; Zepke & Leach, 2005). Student disengagement can also increase demands on lecturers and academic staff due to requests for special consideration and remedial intervention (McInnis, 2002). Disengagement may be ameliorated by emphasising holistic perspectives within courses, but also within the overall culture of an institution. For example, mechanistic thinking tends to emphasise
instrumental outcomes (Gare, 1996; McGilchrist, 2009). Accordingly, the findings of Studies 2 and 3 indicated that higher levels of mechanism were associated with extrinsic aspirations. It has been suggested that the education system uses external rewards (e.g., grades, avoiding punishment) to motivate learning (Csikszentmihalyi & Rochberg-Halton, 1981; Reeve, 2012). Furthermore, university education is often focused on vocational preparation rather than learning-centered pursuits (Nash & Saurman, 1978), and universities often market education as a means to an end (e.g., to get a degree before moving into the workforce) rather than a significant experience in its own right (Kazmi, 2010). Thus, many universities may implicitly emphasise a mechanistic approach to education in which the focus is on instrumental outcomes (e.g., vocational success). The problem with this is that providing external rewards tends to diminish intrinsic interest and autonomous motivation (Deci, 1971; Deci & Ryan, 1985, 2000). Accordingly, students often consider education to be an uninteresting process of striving for grades (Pope, 2002).

Research on the positive outcomes involved with developing a meaningful rationale for work (i.e., autonomous regulation) which comprises pursuing one’s ‘calling’ in life (e.g., Dobrow & Tosti-Kharas, 2011) has indicated that a calling can be found across numerous professions (Bunderson & Thompson, 2009; Duffy et al., 2012) and also in university students (Hirschi, 2011; Hunter, Dik, & Banning, 2010). As the results from Studies 2 and 3 indicated that higher levels of holism were associated with greater levels of autonomous regulation, emphasising holistic perspectives or approaches to education may enable the development of an autonomously regulated ‘calling’. For example, it may be better to emphasise ‘big picture’ views of how the skills or knowledge from one’s course could be applied to helping the community (i.e., intrinsic aspirations) rather than attaining a high paying job in the future (i.e., extrinsic aspirations).
In addition, Eigenberger et al. (2007) found that students studying liberal arts subjects (e.g., philosophy, history) tended to be higher in IP than DP. These levels of IP were higher, and levels of DP lower, than those reported by students majoring in Business, who scored higher on DP than IP. Therefore, liberal arts students tended to be more intellective in their processing, whereas Business majors tended to be more expedient and effortless in their processing. Recall that in Studies 2 and 3, a greater orientation towards IP than DP was associated with higher levels of holistic thinking. Higher levels of holistic thinking were also consistently associated with placing more importance on intrinsic than extrinsic aspirations. It may be that students who are more holistic may have more complex reasons for attending university that may be associated with intrinsic aspirations. Conversely, mechanistic students may be more likely to attend university for less complex, extrinsically motivated (e.g., to attain a degree before moving into the workforce) reasons. Thus, it may be important for universities to help mechanistic students consider their degrees from more meaningful, holistic viewpoints.

Martin, Wilson, Liem, and Ginns (2013) found that students who deferred their university study after high school by choosing to spend a year or more working, travelling, or volunteering had more meaningful reasons for choosing to commence university study. These experiences, in addition to general skills gained by students through their period of deferment lead to greater academic success in comparison to students who did not defer their studies. In a similar fashion to nonattachment which can increase due to life experience (Sahdra et al., 2010), and the finding from Study 2 that nonattachment is associated with higher levels of holism, it may be that various life experiences (e.g., volunteering, travelling) lead to an increase in holism and meaningfulness in study. These applications of holistic and mechanistic thinking to student engagement require further study.
The environment. In a longitudinal study using undergraduate psychology students, Farrugia (2014) found that students who increased in IP also displayed greater awareness of, and care about, the environment and environmental issues. As found in Studies 2 and 3, a greater orientation to IP than DP was associated with higher levels of holism. Thus, perhaps students who became more holistic were better able to understand and see the importance in, environmental systems. In line with this, Gare (1996) and McGilchrist (2009) suggest that mechanistic thinking is antithetical to caring for the environment, as it creates a tendency to view the natural world as resources to be exploited rather than as a complex ecosystem which humanity needs to live in harmony with. Further research however, is required to see if there is any difference in levels of acceptance of climate science, or awareness of how climate change occurs, between holistic and mechanistic individuals. If however, holistic thinking is found to be an important component of caring about the environment, in addition to academic success, societal wellbeing, and as found in Studies 2 and 3, individual wellbeing, it may be important to devise methods of increasing levels of holism.

Ways of increasing holism. Farrugia (2014) found that psychology students who concurrently studied process philosophy (such as that of Gare, 1996) increased in IP. In contrast, psychology students who did not study philosophy were found to increase in DP. Thus, being introduced to the style of thinking and way of looking at the world typical of process philosophy (i.e., that all things are interconnected within a dynamic, ever-changing reality) may result in an increase in holistic thinking. This however, may only have been the case for students who were open-minded, intellective in their processing, or interested enough in undertaking a philosophy course in the first place. A more practical method of increasing holism is based on the work of Martin et al. (2013). Higher education institutions could ensure that more students have access to foreign exchange programs, or are helped to find degree-relevant experience in either paid or voluntary work. The perspective gained through
experiencing new cultures or the realities of work in a particular field may lead to an increase in holistic thinking.

A more radical approach suggested by Haidt (2012; see also Leary, Metzner, & Alpert, 1964/1992), is that certain hallucinogenic drugs such as psilocybin or lysergic acid diethylamide (LSD) may provide people with a perspective which emphasises unity and wholeness rather than fragmented individualism. Thus, hallucinogens could be used to increase levels of holism. Accordingly, in a review of neuroimaging studies in which participants ingested LSD, Gasser et al. (2014) concluded that these studies consistently elicited greater activation of the right hemisphere. The right hemisphere is responsible for holistic perspectives (McGilchrist, 2009). Thus, LSD may enable greater levels of holistic thinking in Western participants who may naturally be more mechanistic. Gasser et al. (2014) also found, in a sample of those with life-threatening illnesses such as cancer, that those who ingested LSD rather than a placebo also experienced a decrease in anxiety. It may be that these individuals increased in nonattachment, in which one accepts the flow of events in life without judgement (Sahdra et al., 2010). Nonattachment was found in Study 2 to be associated with higher levels of holism. Further research however, is required to substantiate these claims. In addition to further research being required to determine the applicability of holistic and mechanistic theory in various social domains, there are some caveats required in interpreting findings from this thesis.

Limitations

The main concern, particularly in Studies 2 and 3, was the representativeness of the samples used and the sample sizes used in the analyses. In all three studies, undergraduates, community samples of convenience, and respondents to a nationwide telephone survey were used. Undergraduate students and individuals comprising the convenience samples,
particularly contacts of the researcher, may not have levels of holism or mechanism, or IP and DP, typical of the average person. For example, Eigenberger et al. (2007) found that university educated individuals tended to be higher in IP than non-university educated members of the general public. While respondents from the nationwide telephone survey may provide a greater level of representativeness, this sample was still influenced by a selection bias. That is, it was only individuals who previously completed the telephone survey and consented to participate in future research who were contacted to participate in Study 1. These individuals may be more interested in research (e.g., due to a greater orientation towards IP than DP) than the average person. Furthermore, those who completed the telephone survey, and were subsequently contacted and completed Study 1, and then consented to be contacted to participate in Studies 2 and 3, may represent a subset of people in the community who are especially interested in participating in research. Overall, these issues of representativeness limit the generalizability of findings.

An additional concern was the sample sizes used in the analyses. In Studies 2 and 3 in particular, the case to parameter ratios were below the 10:1 ratio recommended by Bollen (1989) and Jackson (2003). In combination with concerns regarding the representativeness of the samples used, if the same models comprising Studies 1, 2, and 3 were tested with larger, more representative samples, different results may be obtained. This could result in stronger relationships, or result in paths which were previously non-significant to become significant. The opposite could also be found, which further limits the generalizability of the results.

A further possible limitation is that changes were made to the models in each study on the basis of modification indices. While these changes were theoretically justifiable, the changes were largely data driven and may only be applicable to a particular dataset. Assessing the models in separate samples would provide stronger evidence for the efficacy of each model.
Finally, an additional issue with the models is that self-esteem could be considered to comprise part of wellbeing. There were strong associations between self-esteem and wellbeing in all models, which could be considered as evidence that self-esteem comprises part of wellbeing. Crocker, Luhtanen, Blaine, and Broadnax (1994) for example, assessed psychological wellbeing with two measures used in the current studies (i.e., life satisfaction, depression), in conjunction with hopelessness and self-esteem. Conversely, Diener and Diener (2009) suggest that life satisfaction and self-esteem are separate constructs. Higher levels of self-esteem have also been found to result in greater psychological wellbeing (Paradise & Kernis, 2002; Schimmack & Diener, 2003). Thus, the literature does not provide a clear indication of whether self-esteem leads to psychological wellbeing, or whether it should be considered part of psychological wellbeing.

The theoretical perspective underlying the models in this thesis is that wellbeing (i.e., vitality, life satisfaction, and depression) is the outcome of a process of living which emphasises the satisfaction of basic psychological needs. Eudaimonia (Aristotle, 1954) suggests that this process should involve engaging in behaviours which are personally meaningful, intrinsic aspirations (Kasser & Ryan, 1993, 1996; Grouzet et al., 2005) include items pertaining to self-acceptance, and self-actualization involves notions of unconditional acceptance from others and the satisfaction of esteem needs (Maslow, 1968). Furthermore, self-esteem was expected to be indirectly undermined by extrinsic aspirations as one’s sense of self is inherently defined by meeting the expectation of others (e.g., controlled regulation). Additionally, reduced self-esteem has been suggested to relate to increased extrinsic aspirations and materialism (e.g., Braun & Wicklund, 1989; Chaplin & John, 2007; Dittmar, 2007; Fournier & Richins, 1991; Kasser & Ryan, 1993, 1996). Thus, the models in this thesis conceptualise self-esteem as part of a process of living which includes materialism and aspirations, with wellbeing as an outcome, rather than as a part of wellbeing itself. Further
research could however examine models where self-esteem is considered as part of wellbeing.

**Conclusion**

This thesis has been an exploration of a wide range of ideas and theories, motivated by an attempt to understand the underlying factors that may influence how people think about themselves, others, and society in general, subsequently influencing dominant aspirations and as a result, wellbeing. As part of this process, an awareness of holistic and mechanistic thinking, through the works of Gare (1996) and McGilchrist (2009) was developed. The pursuit of these ideas culminated in Studies 2 and 3, which for the first time provided support for the importance of holistic thinking as the means through which people may choose to place importance on intrinsic aspirations for autonomous, nonattached reasons, rather than socially-created extrinsic aspirations for controlled reasons. This holistic, intrinsic, autonomous, nonattached way of living, akin to that suggested by Aristotle (1954) as part of eudaimonia, appears to result in higher levels of positive outcomes; self-actualization, self-esteem, and wellbeing. This thesis also provided a comprehensive examination of existing measures according with holistic and mechanistic thinking (e.g., AHS: Choi et al., 2007; WHS: Harris et al., 1977; OMPI: Johnson et al., 1988; SPBI: Kramer et al., 1992), and the development of the MHPI which provides the foundation for effective future research into developing a valid, reliable measure of holistic and mechanistic thinking. The application of such a measure has the theoretical potential to contribute to research on a wide range of political, economic, and environmental issues, which may contribute to greater individual and societal wellbeing.
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Appendix A

Investigating motivation, attitudes, and psychological well-being.

Researchers: Brad Elphinstone & Dr. Christine Critchley

This study is being conducted as part of a PhD thesis in Psychology at Swinburne University by Brad Elphinstone. The aim of the study is to investigate the relationship between thinking styles, motivations, attitudes, and overall psychological well-being. This will hopefully add to the literature on the causes of happiness, well-being and life satisfaction.

Individuals aged 18 years or older are invited to participate in this survey which should take no longer than 15 to 30 minutes to complete.

You can either complete the pen and paper version of the questionnaire and mail it back using the enclosed reply paid envelope, or if you would rather complete this questionnaire online, please go to http://opinio.online.swin.edu.au/s?s=11551

At the end of the survey all participants have the option of providing an email address (if applicable) and telephone number in order to go into the draw for one of four $100 gift cards to a store of their choice. As contact details will be collected and stored separately from the questionnaire results, all survey data will be unidentifiable.

In the event of the results from this study being published in a psychological journal, only group statistics, such as overall percentages and averages will be used, meaning that it would be impossible to identify individual responses. This questionnaire and all associated data will be retained under secure conditions for seven years after the completion of the study.

By completing and returning this questionnaire, you are expressing your consent to participate in this study. You are free to withdraw from the completion of this questionnaire at any time, and any questions regarding this project can be directed to:

Brad Elphinstone
belphinstone@swin.edu.au

or:
Dr. Christine Critchley (03) 9214 5480
Psychology Department
Faculty of Life and Social Sciences
ccritchley@swin.edu.au

If for any reason you experience any form of psychological distress as a result of completing the survey and would like to receive counselling, please phone Lifeline (131 114).

This project has been approved by or on behalf of Swinburne’s Human Research Ethics Committee (SUHREC) in line with the National Statement on Ethical Conduct in Human Research. If you have any concerns or complaints about the conduct of this project, you can contact:

Research Ethics Officer, Swinburne Research (H68),
Swinburne University of Technology, P O Box 218, HAWTHORN VIC 3122.
Tel (03) 9214 5218 or +61 3 9214 5218 or resethics@swin.edu.au

Thank you for your valued contribution to the study,
Brad Elphinstone.
Demographic Information

1. What is your age in years?__________

2. What is your gender? (please circle)  Male    Female

3. Which country do you currently reside in?________________________

4. What is the highest educational level you have successfully completed so far? (please circle one)
   a. Primary
   b. Some secondary
   c. Completed Secondary
   d. Trade qualification
   e. TAFE or Diploma level
   f. Incomplete undergraduate study
   g. Complete undergraduate study
   h. Postgraduate

   4a. If you are currently studying/have completed at least some university or TAFE study, indicate your major field of study or that of your highest degree:

  ________________________________________________________________________

   4b. What is your current occupation?

   ________________________________________________________________

   4c. How satisfying is your current occupation?

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5. **What is your level of income? (please circle one)**
   a. $0-$10,000
   b. $10,001 - $20,000
   c. $20,001-$30,000
   d. $30,001-$40,000
   e. $40,001-$50,000
   f. $50,001-$60,000
   g. $60,001-$70,000
   h. $70,001-$80,000
   i. $80,001-$90,000
   j. $90,001-$100,000
   k. $100,001-$250,000
   l. $250,001-$500,000
   m. $500,001-$1,000,000
   n. $1,000,000+

5a. Please circle which is most representative of your current employment.
   Casual
   Part time
   Full time
   Unemployed
   Retired
   Home Duties

6. **Which culture do you most identify with? Please write down one only (e.g., Australian, Chinese, Indian, English).**
7. Which type of religious belief do you most identify with? (please circle one)
   - Anglican (Church of England)
   - Baptist
   - Buddhism
   - Catholic
   - Greek Orthodox
   - Hinduism
   - Islam
   - Judaism
   - Lutheran
   - Presbyterian
   - Uniting Church
   - No religion
   - Other (If you wish to specify: ______________________________)

8. Apart from special religious ceremonies like weddings and funerals, how often do you attend religious services? (please circle one)
   - Never
   - Less than once a year
   - At least once a year
   - Several times a year
   - At least once a month
   - At least once a week

9. Please circle the political party you voted for in the most recent National/Federal election
   - Labor
   - Liberal
   - Nationals
   - Greens
   - Other (if you wish to specify: ______________________________)

10. In political matters, people talk about ‘the left’ and ‘the right’. On a scale from 1 to 10 (where 1 = Left and 10 = Right), where would you place your views generally speaking? Please circle:

    1  2  3  4  5  6  7  8  9  10
This set of questions asks you about the future. Rate each item by selecting how important it is to you for it to happen in the future. (NOTE: Aspiration Index)

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<td></td>
<td></td>
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</tr>
<tr>
<td>29.</td>
<td></td>
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</tr>
<tr>
<td>30.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Continued on next page
The following items have to do with your preferred ways of dealing with certain questions, problems, or issues. For each statement indicate the degree to which it reflects the way you generally believe, feel, or act. (NOTE: Epistemic Preference Indicator)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.</td>
<td>I will express my love for special people.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>32.</td>
<td>I will overcome the challenges that life presents me.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>33.</td>
<td>I will have insight into why I do the things I do.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>34.</td>
<td>I will help the world become a better place.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>35.</td>
<td>I will have a committed, intimate relationship.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>36.</td>
<td>I will have a job that pays well.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>37.</td>
<td>I will “fit in” with others.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>38.</td>
<td>I will be physically healthy.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
<tr>
<td>39.</td>
<td>I will keep up with fashions in hair and clothing.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
</tr>
</tbody>
</table>

---

1. In most learning situations I like it best if topics are concrete and provide information that is obvious and useful.

2. I prefer to invest my time in getting the right information to solve my practical problems.

3. I generally consider myself to be more philosophical – evaluating many diverse ideas.

4. When it comes to deciding what to believe, I usually experiment with different theories and beliefs.

5. The most valuable for the survival of society is standing firm on our core beliefs and values.

6. When it comes to deciding what to believe, I usually stick to the basics – the ‘tried and true’.
<table>
<thead>
<tr>
<th>Number</th>
<th>Statement</th>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.</td>
<td>When confronting the deep philosophical issues of life I am more inclined to just deal with it, get the job done and move on.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>To be perfectly honest, I have a strong need to understand the past and the ideas people had.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>It is best to be a solid, true believer with a firm set of values.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>I mostly have a need for exploring theoretical and novel questions – even if there are no definite answers.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>How much do you agree with this quote: “The unexamined life is not worth living”</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>In discussions I become impatient when people turn simple questions of right and wrong into complicated ethical issues.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>How much do you agree with this quote: “Just do it”</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>In discussions I enjoy exploring the ethical and philosophic problems I find in the world around me.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Very often I get tired of hearing scientific or theoretical explanations for everything in the world.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Very often I try to find a theoretical explanation for events and things in the world.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>In the simplest terms, I don’t need a deep explanation for why a lot of things happen.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>The most valuable for the survival of society is using philosophy and science to question our beliefs.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
</tbody>
</table>
19. I prefer to invest my time in finding explanations for historical, natural, or human conditions.  

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

20. In the simplest terms I have a strong need to study just how and why things happen.  

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

21. In general, I am most satisfied when I am working on a challenging intellectual issue.  

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

22. When it comes to developing a philosophy of life, I have always done alright with the basic guidance I received when I was young.  

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

23. In most learning situations I like it better if topics involve theories and open questions that have no sure answers.  

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

24. In general I am most satisfied by doing activities, or relaxing.  

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

25. When it comes to developing a philosophy of life, I have always tried to consider a wide range of different ideologies.  

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

26. If given a choice, I prefer to deal with smaller, concrete projects that have immediate results.  

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

27. When it comes to reading, studying and other academic work, I tend to become immersed, following a number of related thoughts.  

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

28. True knowledge is completely possible – just open your eyes and ears.  

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

29. I generally consider myself to be more practical – finding the answer that works for me right now.  

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>
Below are a number of statements about your life, with which you may agree or disagree. Please choose the response which most closely represents yourself. (NOTE: Subjective Vitality Scale)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Disagree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>30. When confronting the philosophical issues of life I am more inclined to go into them deeply, constantly looking at different explanations.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>31. To be perfectly honest, I have very little interest in subjects like philosophy and world history.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>32. It is best to be a critical thinker who doubts everything until it’s been tested and verified.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>33. I mostly have a need for a no-nonsense, bottom-line approach to life, where I can get definite answers to my questions.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>34. If given a choice, I prefer to deal with global, conceptual projects with uncertain outcomes.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>35. When it comes to reading, studying and other academic work, I like to finish up quickly and move on to other things.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>36. True knowledge is basically impossible – nothing is really the way it is.</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Not True</th>
<th>Very True</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I feel alive and vital.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>2. I don’t feel very energetic.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>3. Sometimes I feel so alive I just want to burst.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>4. I have energy and spirit.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>5. I look forward to each new day.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>6. I nearly always feel alert and awake.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>7. I feel energised.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
</tbody>
</table>
Below are statements about different attitudes and values. Please choose the response which most closely represents yourself. (NOTE: Material Values Scales)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I admire people who own expensive homes, cars, and clothes.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. I’d be happier if I could afford to buy more things.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. I put less emphasis on material things than most people I know.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. Some of the most important achievements in life include acquiring material possessions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. I have all the things I really need to enjoy life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. I wouldn’t be any happier if I owned nicer things.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. Buying things gives me a lot of pleasure.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. It sometimes bothers me that I can’t afford to buy all the things I’d like.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. The things I own say a lot about how well I’m doing in life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. I like a lot of luxury in life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. I like to own things that impress people.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. I like to keep my life simple, as far as possessions are concerned.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13. My life would be better if I owned certain things I don’t have.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14. The things I own aren’t that important to me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15. I don’t place much emphasis on the amount of material objects people own as a sign of success.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Below is a list of statements dealing with your general feelings about yourself. For each item, select the answer which best represents how you feel now. (NOTE: Rosenberg Self-esteem Scale)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I feel that I’m a person of worth, at least on an equal plane with others.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. I feel that I have a number of good qualities.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. All in all, I am inclined to feel that I am a failure.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. I am able to do things as well as most other people.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5. I feel I do not have much to be proud of.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6. I take a positive attitude toward myself.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7. On the whole, I am satisfied with myself.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8. I wish I could have more respect for myself.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9. I certainly feel useless at times.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10. At times I think I am no good at all.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
Please read each of the following items carefully, thinking about how it relates to your life, and then indicate how true it is for you. (NOTE: Basic Psychological Needs Scale)

<table>
<thead>
<tr>
<th></th>
<th>Not at all true</th>
<th>Somewhat true</th>
<th>Very true</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I feel like I am free to decide for myself how to live my life.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2.</td>
<td>I really like the people I interact with.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3.</td>
<td>Often, I do not feel very competent.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4.</td>
<td>I feel pressured in my life.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>5.</td>
<td>I think I am good at what I do.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>6.</td>
<td>I get along with people I come into contact with.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>7.</td>
<td>I pretty much keep to myself and don't have a lot of social contacts.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>8.</td>
<td>I generally feel free to express my ideas and opinions.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>9.</td>
<td>I consider the people I regularly interact with to be my friends.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>10.</td>
<td>I have been able to learn interesting new skills recently.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>11.</td>
<td>In my daily life, I frequently have to do what I am told.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>12.</td>
<td>People in my life care about me.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>13.</td>
<td>Most days I feel a sense of accomplishment from what I do.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>14.</td>
<td>People I interact with on a daily basis tend to take my feelings into consideration.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>15.</td>
<td>In my life I do not get much of a chance to show how capable I am.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>16.</td>
<td>There are not many people that I am close to.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>17.</td>
<td>I feel like I can pretty much be myself in my daily situations.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>18.</td>
<td>The people I interact with regularly do not seem to like me much.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>19.</td>
<td>I often do not feel very capable.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>20.</td>
<td>There is not much opportunity for me to decide for myself how to do things in my daily life.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>21.</td>
<td>People are generally pretty friendly towards me.</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Below are a number of statements about your life, with which you may agree or disagree. Please choose the response which most closely represents yourself. (NOTE: Satisfaction With Life Scale)

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Neutral</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>In most ways, my life is close to my ideal.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2.</td>
<td>The conditions of my life are excellent.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3.</td>
<td>I am satisfied with life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>4.</td>
<td>So far I have gotten the important things I want in life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>5.</td>
<td>If I could have my life over, I would change almost nothing.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>
Please indicate to what extent each of the following statements corresponds generally to the reasons why you do different things. (NOTE: General Motivation Scale)

<table>
<thead>
<tr>
<th>Do not agree at all</th>
<th>Very slightly agree</th>
<th>Slightly agree</th>
<th>Moderately agree</th>
<th>Mostly agree</th>
<th>Strongly agree</th>
<th>Completely agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Because I do not want to disappoint certain people.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2. In order to help myself become the person I aim to be.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3. Because they represent who I am.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>4. Even though I do not see the benefit in what I am doing.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>5. Because I want other people to see me in a positive way.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>6. Because I chose them as a way to reach my goals.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7. For the pleasure of learning something new.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>8. Because otherwise I would feel guilty for not doing them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>9. Because they are in life with my main beliefs.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>10. Even though it does not make a different whether I do them or not.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>11. For the pleasant feelings I get while I am doing them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>12. To show others what I am capable of.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>13. Because I force myself to do them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>14. Because of the satisfaction I feel in trying to excel in what I do.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>15. Even though I do not have a good reason for doing them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>16. Because I choose to make a commitment to what is important to me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>17. Because I would be upset with myself if I did not do them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>18. Because they reflect what I value most in life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>
Please read each statement and select the answer which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement. (NOTE: Depression subscale of the Depression Anxiety Stress Scale).

The rating scale is as follows:

0       Did not apply to me at all
1       Applied to me to some degree, or some of the time
2       Applied to me to a considerable degree, or a good part of time
3       Applied to me very much, or most of the time

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I couldn't seem to experience any positive feeling at all</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>I just couldn't seem to get going</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>I felt that I had nothing to look forward to</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>I felt sad and depressed</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>I felt that I had lost interest in just about everything</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>I felt I wasn't worth much as a person</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>I felt that life wasn't worthwhile</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>I couldn't seem to get any enjoyment out of the things I did</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>9</td>
<td>I felt down-hearted and blue</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>I was unable to become enthusiastic about anything</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>11</td>
<td>I felt I was pretty worthless</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>12</td>
<td>I could see nothing in the future to be hopeful about</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>13</td>
<td>I felt that life was meaningless</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>14</td>
<td>I found it difficult to work up the initiative to do things</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Thank you very much for participating in this survey. Your assistance is greatly appreciated.

All participants who have completed this questionnaire have the option of entering a draw to win one of four $100 gift cards to a store of your choice. If you wish to be placed into the draw for this prize, please record your email address (if you have one) and a contact telephone number (which will be used ONLY if your email address does not work, or if you do not have an email address) below:

Email:______________________________________________

Phone:______________________________________________
Appendix B

Investigating how the way you view the world influences your psychological well-being.

Student researcher: Brad Elphinstone
Supervisor: Dr. Christine Critchley

This study is being conducted as part of a PhD thesis in Psychology at Swinburne University by Brad Elphinstone. The aim of the study is to investigate the relationship between thinking styles, their causes, and how they relate to overall psychological well-being. This will hopefully add to the literature on the causes of happiness, well-being and life satisfaction.

Individuals aged 18 years or older are invited to participate in this survey which should take no longer than 15 to 30 minutes to complete. At the end of the survey all participants will be re-directed to a separate link where they will have the option of providing their full name, email address, and telephone number in order to go into the draw for one of two $50 gift cards for a store of their choice. Winners will be contacted via email or phone (if no email address is provided) by September 30, 2012. Participants will also be asked to provide consent (optional) to be contacted in order to participate in future research. As names and contact details will be collected and stored separately from the survey results, all survey data will be unidentifiable.

In the event of the results from this study being published in a psychological journal, only group statistics, such as overall percentages and averages will be used, meaning that it would be impossible to identify individual responses. Results from this study will also be used in the student researcher’s PhD thesis. These data will be retained under secure conditions for seven years after the completion of the study.

By completing and returning this questionnaire, you are expressing your consent to participate in this study. You are free to withdraw from the completion of this questionnaire at any time, and any questions regarding this project can be directed to:

Brad Elphinstone
belphinstone@swin.edu.au
or my Supervisor:

Dr. Christine Critchley (03) 9214 5480
Psychology Department
Faculty of Life and Social Sciences
ccritchley@swin.edu.au

For first year Psychology students completing this study as part of the Swinburne University REP program, please print out the final page of the survey (instructions will also appear on this page), write your student identification number and the name of your tutor on it, and place it in the 7th floor mailbox corresponding to this study.

If for any reason you experience any form of psychological distress as a result of completing the survey and would like to receive low cost counselling, please call the Swinburne
Psychology Clinic (9214 8653, psychclinic@swin.edu.au). Swinburne students can access Swinburne Student Services Counselling for free (9214 8025), or if you are unable to contact a counsellor and require help, please phone Lifeline (131 114).

This project has been approved by or on behalf of Swinburne’s Human Research Ethics Committee (SUHREC) in line with the National Statement on Ethical Conduct in Human Research. If you have any concerns or complaints about the conduct of this project, you can contact:

Research Ethics Officer, Swinburne Research (H68), Swinburne University of Technology, P O Box 218, HAWTHORN VIC 3122.

Tel (03) 9214 5218 or +61 3 9214 5218 or resethics@swin.edu.au

Thank you for your valued contribution to the study,
Brad Elphinstone.
Demographic Information

1. What is your age in years?

2. What is your gender? (Male/Female)

3. Which country do you currently reside in?

4. Which country was your mother born in?

5. Which country was your father born in?

6. Which culture do you most identify with? (e.g., Australian, Chinese, Indian, British)

7. What is the highest educational level you have successfully completed so far?
   a. Primary
   b. Some secondary
   c. Completed Secondary
   d. Trade qualification
   e. TAFE or Diploma level
   f. Incomplete undergraduate study
   g. Complete undergraduate study
   h. Postgraduate

8. If you are currently attending university, or completed a degree in the past, what degree did you study? If you did not attend university, what field are you working in now?

9. What is your level of income?
   a. $0-$10,000
   b. $10,001 - $20,000
   c. $20,001-$30,000
   d. $30,001-$40,000
   e. $40,001-$50,000
   f. $50,001-$60,000
   g. $60,001-$70,000
   h. $70,001-$80,000
   i. $80,001-$90,000
   j. $90,001-$100,000
   k. $100,001-$250,000
   l. $250,001-$500,000
   m. $500,001+
10. Please select which is most representative of your current employment.
   - Primarily a student (could also be working part time or on a casual basis to support your education)
   - Casual
   - Part time
   - Full time
   - Unemployed
   - Retired
   - Home Duties

11. Which type of religious belief do you most identify with? (e.g., Catholic, Muslim, Anglican, Jewish, Atheist, etc)

12. Apart from special religious ceremonies like weddings and funerals, how often do you attend religious services?
   - Never
   - Less than once a year
   - At least once a year
   - Several times a year
   - At least once a month
   - At least once a week

13. Please record the political party you voted for in the most recent National/Federal election

14. In political matters, people talk about ‘the left’ and ‘the right’. On a scale from 1 to 10 where 1 = Left and 10 = Right, where would you place your views generally speaking?
This set of questions asks you about the future. Rate each item by selecting how important it is to you for it to happen in the future. (NOTE: Aspiration Index)

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>A little</th>
<th>Moderately</th>
<th>Very</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I will express my love for special people</td>
<td>1 2</td>
<td>3 4</td>
<td>5 6 7 8</td>
<td>9</td>
</tr>
<tr>
<td>2.</td>
<td>I will be admired by many people</td>
<td>1 2</td>
<td>3 4</td>
<td>5 6 7 8</td>
<td>9</td>
</tr>
<tr>
<td>3.</td>
<td>The things I do will make other peoples’ lives better</td>
<td>1 2</td>
<td>3 4</td>
<td>5 6 7 8</td>
<td>9</td>
</tr>
<tr>
<td>4.</td>
<td>I will be polite and obedient</td>
<td>1 2</td>
<td>3 4</td>
<td>5 6 7 8</td>
<td>9</td>
</tr>
<tr>
<td>5.</td>
<td>I will feel that there are people who really love me</td>
<td>1 2</td>
<td>3 4</td>
<td>5 6 7 8</td>
<td>9</td>
</tr>
<tr>
<td>6.</td>
<td>I will achieve the look I’ve been after</td>
<td>1 2</td>
<td>3 4</td>
<td>5 6 7 8</td>
<td>9</td>
</tr>
<tr>
<td>7.</td>
<td>I will help the world become a better place</td>
<td>1 2</td>
<td>3 4</td>
<td>5 6 7 8</td>
<td>9</td>
</tr>
<tr>
<td>8.</td>
<td>I will fit in with others</td>
<td>1 2</td>
<td>3 4</td>
<td>5 6 7 8</td>
<td>9</td>
</tr>
<tr>
<td>9.</td>
<td>People will show affection to me, and I will to them</td>
<td>1 2</td>
<td>3 4</td>
<td>5 6 7 8</td>
<td>9</td>
</tr>
<tr>
<td>10.</td>
<td>My image will be one others find appealing</td>
<td>1 2</td>
<td>3 4</td>
<td>5 6 7 8</td>
<td>9</td>
</tr>
<tr>
<td>11.</td>
<td>I will assist people who need it asking nothing in return</td>
<td>1 2</td>
<td>3 4</td>
<td>5 6 7 8</td>
<td>9</td>
</tr>
<tr>
<td>12.</td>
<td>I will live up to the expectations of my society</td>
<td>1 2</td>
<td>3 4</td>
<td>5 6 7 8</td>
<td>9</td>
</tr>
</tbody>
</table>

Below are a number of statements about your life, with which you may agree or disagree. Please choose the response which most closely represents yourself. (NOTE: Subjective Vitality scale)

<table>
<thead>
<tr>
<th></th>
<th>Not True</th>
<th>A little</th>
<th>Moderately</th>
<th>Very True</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I feel alive and vital.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>I don’t feel very energetic.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>Sometimes I feel so alive I just want to burst.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>I have energy and spirit.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5.</td>
<td>I look forward to each new day.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6.</td>
<td>I nearly always feel alert and awake.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7.</td>
<td>I feel energised.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
Below are statements about different attitudes and values. Please choose the response which most closely represents yourself. (NOTE: Material Values Scale)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I admire people who own expensive homes, cars, and clothes.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. I’d be happier if I could afford to buy more things.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. I put less emphasis on material things than most people I know.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. Some of the most important achievements in life include acquiring material possessions.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. I have all the things I really need to enjoy life.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. I wouldn’t be any happier if I owned nicer things.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. Buying things gives me a lot of pleasure.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. It sometimes bothers me that I can’t afford to buy all the things I’d like.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. The things I own say a lot about how well I’m doing in life.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. I like a lot of luxury in life.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. I like to own things that impress people.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. I like to keep my life simple, as far as possessions are concerned.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13. My life would be better if I owned certain things I don’t have.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14. The things I own aren’t that important to me.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15. I don’t place much emphasis on the amount of material objects people own as a sign of success.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Below are a number of statements about your life, with which you may agree or disagree. Please choose the response which most closely represents yourself.

(Note: Satisfaction With Life Scale)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Strongly</th>
<th>Disagree</th>
<th>Slightly</th>
<th>Neutral</th>
<th>Slightly</th>
<th>Agree</th>
<th>Strongly</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. In most ways, my life is close to my ideal.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>2. The conditions of my life are excellent.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>3. I am satisfied with life.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>4. So far I have gotten the important things I want in life.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>5. If I could have my life over, I would change almost nothing.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>
The items below are organised in pairs and have to do with your preferred ways of dealing with certain questions, problems, or issues. Compare the ‘a’ and ‘b’ options, then choose the answer for EACH statement which reflects the way you generally believe, feel, or act. (NOTE: Epistemic Preference Indicator)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Disagree</th>
<th></th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>1</td>
<td>When confronting the deep philosophical issues of life, I am more inclined to just deal with it, get the job done and move on.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>I have a strong need to study just how and why things happen</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>I mostly have a need for a no-nonsense, bottom-line approach to life, where I can get definite answers to my problems.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>I like to find explanations for historical, natural or human conditions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>When it comes to reading, studying and other work, I like to finish up quickly and move on to other things.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>I have a strong need to understand the past and the ideas people had.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>I become impatient when people turn simple matters or right and wrong into complex ethical issues.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>I generally consider myself to be more philosophical, evaluating many diverse ideas.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Below is a list of statements dealing with your general feelings about yourself. For each item, select the answer which best represents how you feel now. (NOTE: Rosenberg Self-esteem scale)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I feel that I’m a person of worth, at least on an equal plane with others.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>I feel that I have a number of good qualities.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>All in all, I am inclined to feel that I am a failure.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>I am able to do things as well as most other people.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>I feel I do not have much to be proud of.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>I take a positive attitude toward myself.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>On the whole, I am satisfied with myself.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>I wish I could have more respect for myself.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9</td>
<td>I certainly feel useless at times.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10</td>
<td>At times I think I am no good at all.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
Read each of the following items and for each, choose the answer which best represents yourself. (NOTE: Self-Actualization Scale)

<table>
<thead>
<tr>
<th>Item</th>
<th>Disagree</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I do not feel ashamed of my emotions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>2. I feel I must do what others expect me to do.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>3. I believe that people are essentially good and can be trusted.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>4. I feel free to be angry at those I love.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5. It is always necessary that others approve of what I do.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>6. I don’t accept my own weaknesses.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>7. I can like people without having to approve of them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>8. I fear failure.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>9. I avoid attempts to analyze and simplify complex domains.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>10. It is better to be yourself than to be popular.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>11. I have no mission in life to which I feel especially dedicated.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>12. I can express my feelings even when they may result in undesirable consequences.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>13. I do not feel responsible to help anybody.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>14. I am bothered by fears of being inadequate.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>15. I am loved because I give love.</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Please read each statement and select the answer which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement. (NOTE: Depression subscale of the Depression Anxiety Stress Scale)

The rating scale is as follows:

0 Did not apply to me at all

1 Applied to me to some degree, or some of the time

2 Applied to me to a considerable degree, or a good part of time

3 Applied to me very much, or most of the time

<table>
<thead>
<tr>
<th>Item</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I couldn't seem to experience any positive feeling at all</td>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2. I just couldn't seem to get going</td>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3. I felt that I had nothing to look forward to</td>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4. I felt sad and depressed</td>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>5. I felt that I had lost interest in just about everything</td>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>6. I felt I wasn't worth much as a person</td>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>7. I felt that life wasn't worthwhile</td>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>8. I couldn't seem to get any enjoyment out of the things I did</td>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>9. I felt down-hearted and blue</td>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>10. I was unable to become enthusiastic about anything</td>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>11. I felt I was pretty worthless</td>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>12. I could see nothing in the future to be hopeful about</td>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>13. I felt that life was meaningless</td>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>14. I found it difficult to work up the initiative to do things</td>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
Read each of the following statements and indicate how much you agree or disagree with each one. (NOTE: Analytic-Holistic Scale).

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>2.</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>3.</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>4.</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>5.</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>6.</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>7.</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>8.</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>9.</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>10.</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>11.</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>12.</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>13.</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>14.</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>15.</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>16.</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>17.</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>18.</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>19.</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>20.</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>21.</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>22.</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>23.</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>24.</td>
<td>1</td>
<td>7</td>
</tr>
</tbody>
</table>
Please indicate to what extent each of the following statements corresponds generally to the reasons why you do different things. (NOTE: General Motivation Scale)

<table>
<thead>
<tr>
<th>In general, I do things….</th>
<th>Do not agree at all</th>
<th>Very slightly agree</th>
<th>Slightly agree</th>
<th>Moderately agree</th>
<th>Mostly agree</th>
<th>Strongly agree</th>
<th>Completely agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Because I do not want to disappoint certain people.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>2. In order to help myself become the person I aim to be.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>3. Because they represent who I am.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>4. Even though I do not see the benefit in what I am doing.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>5. Because I want other people to see me in a positive way.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>6. Because I chose them as a way to reach my goals.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>7. For the pleasure of learning something new.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>8. Because otherwise I would feel guilty for not doing them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>9. Because they are in life with my main beliefs.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>10. Even though it does not make a difference whether I do them or not.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>11. For the pleasant feelings I get while I am doing them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>12. To show others what I am capable of.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>13. Because I force myself to do them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>14. Because of the satisfaction I feel in trying to excel in what I do.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>15. Even though I do not have a good reason for doing them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>16. Because I choose to make a commitment to what is important to me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>17. Because I would be upset with myself if I did not do them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>18. Because they reflect what I value most in life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>
To help us understand your general approach to life and your views about yourself, others, and life in general, tell us the extent to which the following statements reflect your experiences at this point in your life. Select a number from 1 to 6 on the scale provided with each statement to rate the extent to which you agree with it. Please answer according to what really reflects your experience rather than what you think your experience should be (NOTE: Nonattachment Scale).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Disagree strongly</th>
<th>Disagree moderately</th>
<th>Disagree slightly</th>
<th>Agree slightly</th>
<th>Agree moderately</th>
<th>Agree strongly</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I can accept the flow of events in my life without hanging onto them or pushing them away.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>I can let go of regrets and feelings of dissatisfaction about the past.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>I find I can be calm and/or happy even if things are not going my way.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>I have a hard time appreciating others' successes when they outperform me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>I can remain open to what life offers me regardless of whether it seems desirable or undesirable at a particular time.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>I can enjoy pleasant experiences without needing them to last forever.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>I view the problems that enter my life as things/issues to work on rather than reasons for becoming disheartened or demoralized.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>8</td>
<td>I can enjoy my possessions without being upset when they are damaged or destroyed.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>9</td>
<td>The amount of money I have is not important to my sense of who I am.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>10</td>
<td>I do not go out of my way to cover up or deny my negative qualities or mistakes.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>11</td>
<td>I can accept my flaws.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>12</td>
<td>I can enjoy my family and friends without feeling I need to hang on to them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>13</td>
<td>If things aren't turning out the way I want, I get upset.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>14</td>
<td>I can enjoy the pleasures of life without feeling sad or frustrated when they end.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>15</td>
<td>I can take joy in others' achievements without feeling envious.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>16</td>
<td>I find I can be happy almost regardless of what is going on in my life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>17</td>
<td>Instead of avoiding or denying life's difficulties, I face up to them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>18</td>
<td>I am open to reflecting on my past mistakes and failings.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>19</td>
<td>I do not get 'hung up' on wanting an 'ideal' or 'perfect' life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>20</td>
<td>I am comfortable being an ordinary, less than perfect human being.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>21</td>
<td>I can remain open to thoughts and</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>I can see my own problems and shortcomings without trying to blame them on someone or something outside myself.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>23.</td>
<td>When pleasant experiences end, I am fine moving on to what comes next.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>24.</td>
<td>I am often preoccupied by threats or fears.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>25.</td>
<td>I am not possessive of the people I love.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>26.</td>
<td>I do not have to hang on to the people I love at all costs; I can let them go if they wish to go.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>27.</td>
<td>I do not feel I need to escape or avoid bad experiences in my life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>28.</td>
<td>I can admit my shortcomings without shame or embarrassment.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>29.</td>
<td>I experience and acknowledge grief following significant losses, but do not become overwhelmed, devastated, or incapable of meeting life's other demands.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>30.</td>
<td>I am not possessive of the things I own.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

Thank you very much for participating in this survey.

**Details to go into the running for one of two $50 gift cards:**

First name:

Phone:

Email:

Would you like to be included on our database of people who are willing to be contacted at a later date to participate in future research?

1. Yes (Go to Details)
2. No (Go to end of survey)
Appendix C

Measuring metaphysical lay theories and thinking styles. (Sample 1)

Student researcher: Brad Elphinstone
Supervisor: Associate Professor Christine Critchley

This study is being conducted as part of a PhD thesis in Psychology at Swinburne University by Brad Elphinstone. The aim of the study is to develop a scale which measures the fundamental way in which people view the world, and the nature of existence and Being. The development of this scale will hopefully provide a useful tool in understanding the causes of happiness, well-being and life satisfaction. Individuals aged 18 years or older are invited to participate in this survey which should take no longer than 15 to 30 minutes to complete.

At the end of the survey all participants will be re-directed to a separate link where they will have the option of providing their full name and email address if they wish to be contacted to participate in future research. This is entirely optional and participants are under no obligation to provide consent. As names and contact details will be collected and stored separately from the survey results, all survey data will be unidentifiable.

In the event of the results from this study being published in a psychological journal, only group statistics, such as overall percentages and averages will be used, meaning that it would be impossible to identify individual responses. Results from this study will also be used in the student researcher's PhD thesis. These data will be retained under secure conditions for seven years after the completion of the study.

By completing this questionnaire you are expressing your consent to participate in this study. You are free to withdraw from the completion of this questionnaire at any time, and any questions regarding this project can be directed to:

Brad Elphinstone (belphinstone@swin.edu.au), or my Supervisor:

Associate Professor Christine Critchley (03) 9214 5480
Psychology Department
Faculty of Life and Social Sciences
ccritchley@swin.edu.au

For first year Psychology students completing this study as part of the Swinburne University Research Experience Program, please print out the final page of the survey (instructions will also appear on this page), write your student identification number and the name of your tutor on it, and place it in the 7th floor mailbox corresponding to this study.

If for any reason you experience any form of psychological distress as a result of completing the survey and would like to receive low cost counselling, please call the Swinburne Psychology Clinic (9214 8653, psychclinic@swin.edu.au). Swinburne students can access Swinburne Student Services Counselling for free (9214 8025), or if you are unable to contact a counsellor and require help, please phone Lifeline (131 114).

This project has been approved by or on behalf of Swinburne’s Human Research Ethics Committee (SUHREC) in line with the National Statement on Ethical Conduct in Human Research. If you have any concerns or complaints about the conduct of this project, you can contact:

Research Ethics Officer, Swinburne Research (H68),
Swinburne University of Technology, P O Box 218, HAWTHORN VIC 3122.
Tel (03) 9214 5218 or +61 3 9214 5218 or resethics@swin.edu.au

Thank you for your valued contribution to the study,
Brad Elphinstone.
Demographic Information

1. What is your age in years?

2. What is your gender? (Male/Female)

3. Which country do you currently reside in?

4. Which country was your mother born in?

5. Which country was your father born in?

6. Which culture do you most identify with? (e.g., Australian, Chinese, Indian, British)

7. What is the highest educational level you have successfully completed so far?
   a. Primary
   b. Some secondary
   c. Completed Secondary
   d. Trade qualification
   e. TAFE or Diploma level
   f. Incomplete undergraduate study
   g. Complete undergraduate study
   h. Postgraduate

8. If you are currently attending university, or completed a degree in the past, what degree did you study? If you did not attend university, what field are you working in now?

9. What is your level of income?
   a. $0-$10,000
   b. $10,001 - $20,000
   c. $20,001-$30,000
   d. $30,001-$40,000
   e. $40,001-$50,000
   f. $50,001-$60,000
   g. $60,001-$70,000
   h. $70,001-$80,000
   i. $80,001-$90,000
   j. $90,001-$100,000
   k. $100,001-$250,000
   l. $250,001-$500,000
   m. $500,001-$1,000,000
   n. 

10. Please select which is most representative of your current employment.
    • Primarily a student (could also be working part time or on a casual basis to support your education)
    • Casual
    • Part time
    • Full time
    • Unemployed
    • Retired
    • Home Duties
11. Which type of religious belief do you most identify with? (e.g., Catholic, Muslim, Anglican, Jewish, Atheist, etc)

12. Apart from special religious ceremonies like weddings and funerals, how often do you attend religious services?
   • Never
   • Less than once a year
   • At least once a year
   • Several times a year
   • At least once a month
   • At least once a week

13. Please record the political party you voted for in the most recent National/Federal election

14. In political matters, people talk about ‘the left’ and ‘the right’. On a scale from 1 to 10 where 1 = Left and 10 = Right, where would you place your views generally speaking?
This is a questionnaire about how people relate to their world. Listed below are pairs of statements concerning thoughts, attitudes, and ways of behaving.

Please read each statement carefully and find the one which pertains to you more closely. No statement is more "correct" than the other.

An answer sheet is provided for your responses. Please answer all items, but select only one statement ("a" or "b") in each pair. (NOTE: Organismic Mechanistic Paradigm Inventory).

1)   a) Schools should be where a child learns to think for him/herself.
     b) Schools should be where a child learns basic information.

2)   a) Things really look different if we change how we see them.
     b) Things really look different only if they are changed.

3)   a) Organisms change by forces from outside themselves.
     b) Organisms can change themselves.

4)   a) A good judge is purely objective.
     b) A good judge is not objective and knows it.

5)   a) Great discoveries come from scientific imagination.
     b) Great discoveries come from scientific experimentation.

6)   a) All things stay basically the same over time.
     b) All things change from one moment to the next.

7)   a) A business executive needs time to analyze the facts.
     b) A business executive needs time for creative thinking.

8)   a) Before making a big decision, I like to sleep on it.
     b) Before making a big decision, I like to get all the information.

9)   a) Progress in science occurs when there is a new way of looking at events.
     b) Progress in science occurs when an important observation is made.

10)  a) A criminal is just a burden to society.
      b) A criminal has a function in society.

11)  a) Our knowledge is limited by our observations.
      b) Our knowledge is limited by our imagination.

12)  a) Living is a process of using up the available supplies.
      b) Living is a process of exchanging supplies back and forth.

13)  a) Events are sometimes just the same as before.
      b) Events are always new and different in some way.

14)  a) Divorce is often a phase in each partner's growth.
      b) Divorce is usually the result of incompatible personalities.

15)  a) Facts are more useful than a good idea.
      b) Facts are less useful than a good idea.
16)  a) Each relationship I have is different.
b) Each relationship I have is much like the previous one.

17)  a) Things are changed only when they are directly affected.
b) Things are changed by everything else.

18)  a) We learn by carefully examining individual facts.
b) We learn by finding order in an array of facts.

19)  a) To live independently of other people is not a realistic goal.
b) To live independently of other people is a realistic goal.

20)  a) War can be understood by examining what purpose it served.
b) War can be understood by examining its causes.

21)  a) The world is like a large, living organism.
b) The world is like a large, complex machine.

22)  a) A child discovers the world by being praised and punished.
b) A child discovers the world by testing his/her dreams and fears.

23)  a) I can change things in my family only by planned action.
b) I can change things in my family just by being who I am.

24)  a) A child’s world is different from mine.
b) A child’s world is like mine, but he/she knows less.

25)  a) Persons are made by their environments.
b) Persons and their environments affect each other.

26)  a) To resolve a family dispute, it is important how we look at the facts.
b) To resolve a family dispute, it is important to discover all the facts.

**Note: The following items were included at the end of the OMPI items and were used to comprise the MHPI.**

1)  a) If two people are arguing about something, they might both be right, if you consider both perspectives
b) If two people are arguing about something, one of them must be wrong.

2)  a) Reality is subjective and different for all people.
b) There is a single objective reality which is true for all people.

3)  a) We do not see the world for what it is, but how we are.
b) There is a single objective truth, no matter what perspective you take.

4)  a) There is not always one ‘right’ answer, just different perspectives.
b) There is always a ‘right’ answer and a ‘wrong’ answer.

5)  a) Most things in life are in a constant state of flux and change.
b) Most things in life remain constant and unchanging.

6)  a) The universe, like a living organism, consists as a system of complex, interrelated processes.
b) The universe, like a machine, consists of separate parts that work together.

7) a) Society is a result of all people connected as a whole.
    b) There is no such thing as society, just individuals and their families.

8) a) Organisms shape, and are shaped by, their respective environments.
    b) Organisms are independent of their respective environments.

9) a) It is not possible to be completely independent in society; all people rely on others one way or another.
    b) It is completely possible to be independent in society without relying on anyone.

This set of questions asks you about the future. Rate each item by selecting how important it is to you for it to happen in the future. (NOTE: Aspiration Index)

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>A little</th>
<th>Moderately</th>
<th>Very</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I will express my love for special people</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. I will be admired by many people</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. The things I do will make other peoples’ lives better</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. I will be polite and obedient</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. I will feel that there are people who really love me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. I will achieve the look I’ve been after</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. I will help the world become a better place</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. I will fit in with others</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. People will show affection to me, and I will to them</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. My image will be one others find appealing</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. I will assist people who need it asking nothing in return</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. I will live up to the expectations of my society</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Below are a number of statements about your life, with which you may agree or disagree. Please choose the response which most closely represents yourself. (NOTE: Subjective Vitality scale)

<table>
<thead>
<tr>
<th></th>
<th>Not True</th>
<th>Very True</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I feel alive and vital.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2. I don’t feel very energetic.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3. Sometimes I feel so alive I just want to burst.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4. I have energy and spirit.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>5. I look forward to each new day.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>6. I nearly always feel alert and awake.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>7. I feel energised.</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
Below are a number of statements about your life, with which you may agree or disagree. Please choose the response which most closely represents yourself. (NOTE: Satisfaction With Life Scale)

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Neutral</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>In most ways, my life is close to my ideal.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2.</td>
<td>The conditions of my life are excellent.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3.</td>
<td>I am satisfied with life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>4.</td>
<td>So far I have gotten the important things I want in life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>5.</td>
<td>If I could have my life over, I would change almost nothing.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

Below is a list of statements dealing with your general feelings about yourself. For each item, select the answer which best represents how you feel now. (NOTE: Rosenberg Self-esteem scale)

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I feel that I’m a person of worth, at least on an equal plane with others.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>I feel that I have a number of good qualities.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>All in all, I am inclined to feel that I am a failure.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>I am able to do things as well as most other people.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5.</td>
<td>I feel I do not have much to be proud of.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6.</td>
<td>I take a positive attitude toward myself.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7.</td>
<td>On the whole, I am satisfied with myself.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8.</td>
<td>I wish I could have more respect for myself.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>9.</td>
<td>I certainly feel useless at times.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>10.</td>
<td>At times I think I am no good at all.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
Please indicate to what extent each of the following statements corresponds generally to the reasons why you do different things. (NOTE: General Motivation Scale)

<table>
<thead>
<tr>
<th>In general, I do things….</th>
<th>Do not agree at all</th>
<th>Very slightly agree</th>
<th>Slightly agree</th>
<th>Moderately agree</th>
<th>Mostly agree</th>
<th>Strongly agree</th>
<th>Completely agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Because I do not want to disappoint certain people.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>2. In order to help myself become the person I aim to be.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>3. Because they represent who I am.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>4. Even though I do not see the benefit in what I am doing.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>5. Because I want other people to see me in a positive way.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>6. Because I chose them as a way to reach my goals.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>7. For the pleasure of learning something new.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>8. Because otherwise I would feel guilty for not doing them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>9. Because they are in life with my main beliefs.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>10. Even though it does not make a difference whether I do them or not.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>11. For the pleasant feelings I get while I am doing them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>12. To show others what I am capable of.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>13. Because I force myself to do them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>14. Because of the satisfaction I feel in trying to excel in what I do.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>15. Even though I do not have a good reason for doing them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>16. Because I choose to make a commitment to what is important to me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>17. Because I would be upset with myself if I did not do them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>18. Because they reflect what I value most in life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>
Thinking about yourself and how you normally feel, to what extent do you generally feel:
(NOTE: International Positive and Negative Affect Scale Revised)

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Upset</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2. Hostile</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3. Alert</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4. Ashamed</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>5. Inspired</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>6. Nervous</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>7. Determined</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>8. Attentive</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>9. Afraid</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>10. Active</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

For each of the following statements, select the answer on the 5-point scale (1 = Strongly Disagree, 5 = Strongly Agree) that best describes how that statement applies to you and your mother/father. Try to read and think about each statement as it applies to you and your mother/father during your years of growing up at home. There are no right or wrong answers, so don’t spend a lot of time on any one item. We are looking for your overall impressions regarding each statement (NOTE: Parental Assessment Questionnaire – Short).

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Authoritative Parenting</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Once family policy had been established, my father/mother discussed the reasoning behind the policy with the children.</td>
<td>1  2  3  4  5</td>
<td></td>
</tr>
<tr>
<td>2. My father/mother directed the activities and decisions of the children through reasoning and discipline</td>
<td>1  2  3  4  5</td>
<td></td>
</tr>
<tr>
<td>3. As I was growing up, if my father/mother made a decision in the family that hurt me, he/she was willing to discuss that decision with me and to admit if he/she had made a mistake.</td>
<td>1  2  3  4  5</td>
<td></td>
</tr>
<tr>
<td>4. As the children in my family were growing up, my father/mother consistently gave us direction and guidance in rational and objective ways.</td>
<td>1  2  3  4  5</td>
<td></td>
</tr>
<tr>
<td>5. As I was growing up, my father/mother gave me clear direction for my behaviours and activities, but he/she was also understanding when I disagreed with him/her.</td>
<td>1  2  3  4  5</td>
<td></td>
</tr>
<tr>
<td>6. My father/mother had clear standards of behaviour for the children in our home, but he/she was willing to adjust those standards to the needs of each of the individual children in the family.</td>
<td>1  2  3  4  5</td>
<td></td>
</tr>
<tr>
<td>7. My father/mother gave me direction for my behaviour and</td>
<td>1  2  3  4  5</td>
<td></td>
</tr>
</tbody>
</table>
activities as I was growing up and he/she expected me to follow his/her direction, but he/she was always willing to listen to my concerns and to discuss that direction with me.

Authoritarian Parenting

8. My father/mother has always felt that more force should be used by parents in order to get their children to behave the way they are supposed to.

9. My father/mother felt that wise parents should teach their children early who is boss in the family.

10. Whenever my father/mother told me to do something as I was growing up, he/she expected me to do it immediately without asking any questions.

11. Even if his/her children didn’t agree with him/her, my father/mother felt that it was for our own good if we were forced to conform to what he/she thought was right.

12. As I was growing up, my father/mother would get very upset if I tried to disagree with him/her.

13. As I was growing up, my father/mother let me know what behaviour he/she expected of me, and if I didn’t meet those expectations, he/she punished me.

14. My father/mother has always felt that most problems in society would be solved if parents strictly and forcibly dealt with their children when they don’t do what they are supposed to.

Permissive parenting

15. My father/mother did not direct the behaviours, activities, and desires of children in the family.

16. My father/mother did not view him/herself as responsible for directing and guiding my behaviour as I was growing up.

17. My father/mother feels that most problems in society would be solved if parents did not restrict their children’s activities, decisions, and desires.

18. My father/mother has always felt that children need to be free to make up their own minds and to do what they want to do, even if this does not agree with what their parents might want.

19. As I was growing up, my father/mother seldom gave me expectations and guidelines for my behaviour.

20. As I was growing up, my father/mother did not feel that I need to obey rules and regulations of behaviour simply because someone in authority has established them.
Thank you very much for participating in this survey.

Would you like to be included on our database of people who are willing to be contacted at a later date to participate in future research?

3. Yes (Go to Details)
4. No (Go to end of survey)

Details:

First name:

Phone:

Email:
Measuring metaphysical lay theories and thinking styles. (Sample 2)

Student researcher: Brad Elphinstone
Supervisor: Associate Professor Christine Critchley

This study is being conducted as part of a PhD thesis in Psychology at Swinburne University by Brad Elphinstone. The aim of the study is to develop a scale which measures the fundamental way in which people view the world, and the nature of existence and Being. The development of this scale will hopefully provide a useful tool in understanding the causes of happiness, well-being and life satisfaction.

Individuals aged 18 years or older are invited to participate in this survey which should take no longer than 15 to 30 minutes to complete.

At the end of the survey all participants will be re-directed to a separate link where they will have the option of providing their full name, email address, and telephone number in order to go into the draw for one of two $50 gift cards for a store of their choice. Winners will be contacted via email or phone (if no email address is provided) by 1 August, 2013. Participants will also be asked to provide consent (optional) to be contacted in order to participate in future research. As names and contact details will be collected and stored separately from the survey results, all survey data will be unidentifiable.

In the event of the results from this study being published in a psychological journal, only group statistics, such as overall percentages and averages will be used, meaning that it would be impossible to identify individual responses. Results from this study will also be used in the student researcher’s PhD thesis. These data will be retained under secure conditions for seven years after the completion of the study.

By completing this questionnaire you are expressing your consent to participate in this study. You are free to withdraw from the completion of this questionnaire at any time, and any questions regarding this project can be directed to:

Brad Elphinstone
belphinstone@swin.edu.au
or my Supervisor:

Associate Professor Christine Critchley (03) 9214 5480
Psychology Department
Faculty of Life and Social Sciences
ccritchley@swin.edu.au

If for any reason you experience any form of psychological distress as a result of completing the survey and would like to receive low cost counselling, please call the Swinburne Psychology Clinic (9214 8653, pseychclinic@swin.edu.au). Swinburne students can access Swinburne Student Services Counselling for free (9214 8025), or if you are unable to contact a counsellor and require help, please phone Lifeline (131 114).

This project has been approved by or on behalf of Swinburne’s Human Research Ethics Committee (SUHREC) in line with the National Statement on Ethical Conduct in Human Research. If you have any concerns or complaints about the conduct of this project, you can contact:

Research Ethics Officer, Swinburne Research (H68),
Swinburne University of Technology, P O Box 218, HAWTHORN VIC 3122.

Tel (03) 9214 5218 or +61 3 9214 5218 or resethics@swin.edu.au

Thank you for your valued contribution to the study,
Brad Elphinstone.
Demographic Information

1. What is your age in years?

2. What is your gender? (Male/Female)

3. Which country do you currently reside in?

4. Which country was your mother born in?

5. Which country was your father born in?

6. Which culture do you most identify with? (e.g., Australian, Chinese, Indian, British)

7. What is the highest educational level you have successfully completed so far?
   a. Primary
   b. Some secondary
   c. Completed Secondary
   d. Trade qualification
   e. TAFE or Diploma level
   f. Incomplete undergraduate study
   g. Complete undergraduate study
   h. Postgraduate

8. If you are currently attending university, or completed a degree in the past, what degree did you study? If you did not attend university, what field are you working in now?

9. What is your level of income?
   a. $0-$10,000
   b. $10,001 - $20,000
   c. $20,001-$30,000
   d. $30,001-$40,000
   e. $40,001-$50,000
   f. $50,001-$60,000
   g. $60,001-$70,000
   h. $70,001-$80,000
   i. $80,001-$90,000
   j. $90,001-$100,000
   k. $100,001-$250,000
   l. $250,001-$500,000
   m. $500,001-$1,000,000

10. Please select which is most representative of your current employment.
   • Primarily a student (could also be working part time or on a casual basis to support your education)
   • Casual
   • Part time
   • Full time
   • Unemployed
   • Retired
   • Home Duties
11. Which type of religious belief do you most identify with? (e.g., Catholic, Muslim, Anglican, Jewish, Atheist, etc)

12. Apart from special religious ceremonies like weddings and funerals, how often do you attend religious services?
   - Never
   - Less than once a year
   - At least once a year
   - Several times a year
   - At least once a month
   - At least once a week

13. Please record the political party you voted for in the most recent National/Federal election

14. In political matters, people talk about ‘the left’ and ‘the right’. On a scale from 1 to 10 where 1 = Left and 10 = Right, where would you place your views generally speaking?
This is a questionnaire about how people relate to their world. Listed below are pairs of statements concerning thoughts, attitudes, and ways of behaving.

Please read each statement carefully and find the one which pertains to you more closely. No statement is more "correct" than the other.

An answer sheet is provided for your responses. Please answer all items, but select only one statement ("a" or "b") in each pair. (NOTE: Organismic Mechanistic Paradigm Inventory).

1) a) Schools should be where a child learns to think for him/herself.  
b) Schools should be where a child learns basic information.

2) a) Things really look different if we change how we see them.  
b) Things really look different only if they are changed.

3) a) Organisms change by forces from outside themselves.  
b) Organisms can change themselves.

4) a) A good judge is purely objective.  
b) A good judge is not objective and knows it.

5) a) Great discoveries come from scientific imagination.  
b) Great discoveries come from scientific experimentation.

6) a) All things stay basically the same over time.  
b) All things change from one moment to the next.

7) a) A business executive needs time to analyze the facts.  
b) A business executive needs time for creative thinking.

8) a) Before making a big decision, I like to sleep on it.  
b) Before making a big decision, I like to get all the information.

9) a) Progress in science occurs when there is a new way of looking at events.  
b) Progress in science occurs when an important observation is made.

10) a) A criminal is just a burden to society.  
b) A criminal has a function in society.

11) a) Our knowledge is limited by our observations.  
b) Our knowledge is limited by our imagination.

12) a) Living is a process of using up the available supplies.  
b) Living is a process of exchanging supplies back and forth.

13) a) Events are sometimes just the same as before.  
b) Events are always new and different in some way.

14) a) Divorce is often a phase in each partner’s growth.  
b) Divorce is usually the result of incompatible personalities.

15) a) Facts are more useful than a good idea.  
b) Facts are less useful than a good idea.
16)  a) Each relationship I have is different.  
    b) Each relationship I have is much like the previous one.  

17)  a) Things are changed only when they are directly affected.  
    b) Things are changed by everything else.  

18)  a) We learn by carefully examining individual facts.  
    b) We learn by finding order in an array of facts.  

19)  a) To live independently of other people is not a realistic goal.  
    b) To live independently of other people is a realistic goal.  

20)  a) War can be understood by examining what purpose it served.  
    b) War can be understood by examining its causes.  

21)  a) The world is like a large, living organism.  
    b) The world is like a large, complex machine.  

22)  a) A child discovers the world by being praised and punished.  
    b) A child discovers the world by testing his/her dreams and fears.  

23)  a) I can change things in my family only by planned action.  
    b) I can change things in my family just by being who I am.  

24)  a) A child’s world is different from mine.  
    b) A child’s world is like mine, but he/she knows less.  

25)  a) Persons are made by their environments.  
    b) Persons and their environments affect each other.  

26)  a) To resolve a family dispute, it is important how we look at the facts.  
    b) To resolve a family dispute, it is important to discover all the facts.  

**Note:** The following items were included at the end of the OMPI items and were used to comprise the MHPI.  

1)  a) If two people are arguing about something, they might both be right, if you consider both perspectives  
    b) If two people are arguing about something, one of them must be wrong.  

2)  a) Reality is subjective and different for all people.  
    b) There is a single objective reality which is true for all people.  

3)  a) We do not see the world for what it is, but how we are.  
    b) There is a single objective truth, no matter what perspective you take.  

4)  a) There is not always one ‘right’ answer, just different perspectives.  
    b) There is always a ‘right’ answer and a ‘wrong’ answer.  

5)  a) Most things in life are in a constant state of flux and change.  
    b) Most things in life remain constant and unchanging.
6) a) The universe, like a living organism, consists as a system of complex, interrelated processes.
   b) The universe, like a machine, consists of separate parts that work together.

7) a) Society is a result of all people connected as a whole.
   b) There is no such thing as society, just individuals and their families.

8) a) Organisms shape, and are shaped by, their respective environments.
   b) Organisms are independent of their respective environments.

9) a) It is not possible to be completely independent in society; all people rely on others one way or another.
   b) It is completely possible to be independent in society without relying on anyone.

Below are statements about different attitudes and values. Please choose the response which most closely represents yourself. (NOTE: Material Values Scale)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I admire people who own expensive homes, cars, and clothes.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. I’d be happier if I could afford to buy more things.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. I put less emphasis on material things than most people I know.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. Some of the most important achievements in life include acquiring material possessions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. I have all the things I really need to enjoy life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. I wouldn’t be any happier if I owned nicer things.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. Buying things gives me a lot of pleasure.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. It sometimes bothers me that I can’t afford to buy all the things I’d like.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. The things I own say a lot about how well I’m doing in life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. I like a lot of luxury in life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. I like to own things that impress people.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. I like to keep my life simple, as far as possessions are concerned.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13. My life would be better if I owned certain things I don’t have.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14. The things I own aren’t that important to me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15. I don’t place much emphasis on the amount of material objects people own as a sign of success.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
The items below are organised in pairs and have to do with your preferred ways of dealing with certain questions, problems, or issues. Compare the ‘a’ and ‘b’ options, then choose the answer for EACH statement which reflects the way you generally believe, feel, or act. (NOTE: Epistemic Preference Indicator)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Disagree</th>
<th></th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I have a strong need to study just how and why things happen</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>I mostly have a need for a no-nonsense, bottom-line approach to life, where I can get definite answers to my problems.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>I like to find explanations for historical, natural or human conditions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>I have a strong need to understand the past and the ideas people had.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5.</td>
<td>I become impatient when people turn simple matters or right and wrong into complex ethical issues.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6.</td>
<td>I generally consider myself to be more philosophical, evaluating many diverse ideas.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7.</td>
<td>If given a choice, I prefer to deal with global, conceptual projects with uncertain outcomes.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8.</td>
<td>The most valuable for the survival of society is using philosophy and science to question our beliefs.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Read each of the following items and for each, choose the answer which best represents yourself. (NOTE: Self-Actualization Scale)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Disagree</th>
<th></th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I do not feel ashamed of my emotions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>I feel I must do what others expect me to do.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>I believe that people are essentially good and can be trusted.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>I feel free to be angry at those I love.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5.</td>
<td>It is always necessary that others approve of what I do.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6.</td>
<td>I don’t accept my own weaknesses.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7.</td>
<td>I can like people without having to approve of them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8.</td>
<td>I fear failure.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>9.</td>
<td>I avoid attempts to analyse and simplify complex domains.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>10.</td>
<td>It is better to be yourself than to be popular.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>11.</td>
<td>I have no mission in life to which I feel especially dedicated.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>12.</td>
<td>I can express my feelings even when they may result in undesirable consequences.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>13.</td>
<td>I do not feel responsible to help anybody.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>14.</td>
<td>I am bothered by fears of being inadequate.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>15.</td>
<td>I am loved because I give love.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
Each of the items below asks about yourself, your family and the country you live in. For each question, please select the answer which best describes you (NOTE: Relational Individual Collective self-construal scale).

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Relational self-construal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. I think it is very important in life to be true to my friends.</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>2. I find it very satisfying to do something for the benefit of someone else.</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>3. I am very concerned about my family’s future.</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td><strong>Individual self-construal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. I think it is very important in life to be true to myself.</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>2. I find it very satisfying to do something just for myself.</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>3. I am very concerned about my own future.</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td><strong>Collective self-construal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. I think it is very important in life to be true to my fellow Australians.</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>2. I find it very satisfying to do something for the benefit of other Australians.</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>3. I am very concerned about Australia’s future.</td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
</tbody>
</table>
Read each of the following statements and indicate how much you agree or disagree with each one. (NOTE: Analytic-Holistic Scale).

<table>
<thead>
<tr>
<th>Number</th>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Everything in the universe is somehow related to each other.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>It is more desirable to take the middle ground that go to extremes.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Every phenomenon in the world moves in predictable directions.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>The whole, rather than the parts, should be considered in order to understand a phenomenon.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Nothing is unrelated.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Everything in the world is intertwined in a causal relationship.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>When disagreement exists among people, they should look for ways to compromise and embrace everyone’s opinions.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>A person who is currently living a successful life will continue to stay successful.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>It is more important to pay attention to the whole rather than its parts.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>The whole is greater than the sum of its parts.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>It is more important to find a point of compromise that to debate who is right/wrong, when one’s opinions conflict with other’s opinions.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Even a small change in any element of the universe (WORLD?) can lead to significant alterations in other elements.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>An individual who is currently honest will stay honest in the future.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>If an event is moving toward a certain direction, it will continue to move toward that direction.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>It is desirable to be in harmony, rather than in discord, with others of different opinions that one’s own.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>It is more important to pay attention to the whole context rather than the details.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Any phenomenon has numerous causes, although some of the causes may not be known.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Current situations can change at any time.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>It is not possible to understand the parts without considering the whole picture.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Choosing a middle ground in an argument should be avoided.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Any phenomenon entails a numerous number of consequences, although some of them may not be known.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>We should avoid going to extremes.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>We should consider the situation a person is faced with, as well as his/her personality, in order to understand their behavior.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Future events are predictable based on present situations.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>
To help us understand your general approach to life and your views about yourself, others, and life in general, tell us the extent to which the following statements reflect your experiences at this point in your life. Select a number from 1 to 6 on the scale provided with each statement to rate the extent to which you agree with it. Please answer according to what really reflects your experience rather than what you think your experience should be (NOTE: Nonattachment Scale).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Disagree strongly</th>
<th>Disagree moderately</th>
<th>Disagree slightly</th>
<th>Agree slightly</th>
<th>Agree moderately</th>
<th>Agree strongly</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I can accept the flow of events in my life without hanging onto them or pushing them away.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>I can let go of regrets and feelings of dissatisfaction about the past.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>I find I can be calm and/or happy even if things are not going my way.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>I have a hard time appreciating others' successes when they outperform me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>I can remain open to what life offers me regardless of whether it seems desirable or undesirable at a particular time.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>I can enjoy pleasant experiences without needing them to last forever.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>I view the problems that enter my life as things/issues to work on rather than reasons for becoming disheartened or demoralized.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>8</td>
<td>I can enjoy my possessions without being upset when they are damaged or destroyed.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>9</td>
<td>The amount of money I have is not important to my sense of who I am.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>10</td>
<td>I do not go out of my way to cover up or deny my negative qualities or mistakes.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>11</td>
<td>I can accept my flaws.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>12</td>
<td>I can enjoy my family and friends without feeling I need to hang on to them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>13</td>
<td>If things aren't turning out the way I want, I get upset.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>14</td>
<td>I can enjoy the pleasures of life without feeling sad or frustrated when they end.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>15</td>
<td>I can take joy in others' achievements without feeling envious.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>16</td>
<td>I find I can be happy almost regardless of what is going on in my life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>17</td>
<td>Instead of avoiding or denying life's difficulties, I face up to them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>18</td>
<td>I am open to reflecting on my past mistakes and failings.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>19</td>
<td>I do not get 'hung up' on wanting an 'ideal' or 'perfect' life.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>20</td>
<td>I am comfortable being an ordinary, less than perfect human being.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>21</td>
<td>I can remain open to thoughts and</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>
feelings that come into my mind, even if they are negative or painful.

22. I can see my own problems and shortcomings without trying to blame them on someone or something outside myself.

23. When pleasant experiences end, I am fine moving on to what comes next.

24. I am often preoccupied by threats or fears.

25. I am not possessive of the people I love.

26. I do not have to hang on to the people I love at all costs; I can let them go if they wish to go.

27. I do not feel I need to escape or avoid bad experiences in my life.

28. I can admit my shortcomings without shame or embarrassment.

29. I experience and acknowledge grief following significant losses, but do not become overwhelmed, devastated, or incapable of meeting life's other demands.

30. I am not possessive of the things I own.

Below are a number of statements about your life, with which you may agree or disagree. Please choose the response which most closely represents yourself. (NOTE: Subjective Vitality scale)

<table>
<thead>
<tr>
<th></th>
<th>Not True</th>
<th>Very True</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I feel alive and vital.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>2</td>
<td>I don’t feel very energetic.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>3</td>
<td>Sometimes I feel so alive I just want to burst.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>4</td>
<td>I have energy and spirit.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>5</td>
<td>I look forward to each new day.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>6</td>
<td>I nearly always feel alert and awake.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>7</td>
<td>I feel energised.</td>
<td>1 2 3 4 5 6 7</td>
</tr>
</tbody>
</table>
For each of the following items select the answer which best reflects your views. There are no right or wrong answers, so do not spend too much time on any one item. (NOTE: Entity/incremental scales).

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intelligence</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. You have a certain amount of intelligence and you really can’t do much to change it.</td>
<td>1 2 3 4 5 6</td>
<td></td>
</tr>
<tr>
<td>2. Your intelligence is something about you that you can’t change very much.</td>
<td>1 2 3 4 5 6</td>
<td></td>
</tr>
<tr>
<td>3. You can learn new things, but you can’t really change your basic intelligence.</td>
<td>1 2 3 4 5 6</td>
<td></td>
</tr>
<tr>
<td><strong>Morality</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. A person’s moral character is something very basic about them and it can’t be changed much.</td>
<td>1 2 3 4 5 6</td>
<td></td>
</tr>
<tr>
<td>2. Whether a person is responsible and sincere or not it deeply ingrained in their personality. It cannot be changed very much.</td>
<td>1 2 3 4 5 6</td>
<td></td>
</tr>
<tr>
<td>3. There is not much that can be done to change a person’s moral traits (e.g., conscientiousness, uprightness, and honesty).</td>
<td>1 2 3 4 5 6</td>
<td></td>
</tr>
<tr>
<td><strong>World</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Though we can change some phenomena, it is unlikely that we can alter the core dispositions of our world.</td>
<td>1 2 3 4 5 6</td>
<td></td>
</tr>
<tr>
<td>2. Our world has its basic or ingrained dispositions, and you really can’t do much to change them.</td>
<td>1 2 3 4 5 6</td>
<td></td>
</tr>
<tr>
<td>3. Some societal trends may dominate for a while, but the fundamental nature of our world is something that cannot be changed much.</td>
<td>1 2 3 4 5 6</td>
<td></td>
</tr>
<tr>
<td><strong>Person</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. The kind of person someone is is something very basic about them and it can’t be changed much.</td>
<td>1 2 3 4 5 6</td>
<td></td>
</tr>
<tr>
<td>2. People can do things differently, but the important parts of who they are can’t really be changed.</td>
<td>1 2 3 4 5 6</td>
<td></td>
</tr>
<tr>
<td>3. Everyone is a certain kind of person and there is not much that can be done to really change that.</td>
<td>1 2 3 4 5 6</td>
<td></td>
</tr>
</tbody>
</table>

Thank you very much for participating in this survey.

Would you like to be included on our database of people who are willing to be contacted at a later date to participate in future research?

1. Yes (Go to Details)
2. No (Go to end of survey)

**Details:**

First name:

Phone:

Email:
Measuring metaphysical lay theories and thinking styles. (Sample 3)

Student researcher: Brad Elphinstone
Supervisor: Associate Professor Christine Critchley

This study is being conducted as part of a PhD thesis in Psychology at Swinburne University by Brad Elphinstone. The aim of the study is to develop a scale which measures the fundamental way in which people view the world, and the nature of existence and Being. The development of this scale will hopefully provide a useful tool in understanding the causes of happiness, well-being and life satisfaction.

Individuals aged 18 years or older are invited to participate in this survey which should take no longer than 15 to 30 minutes to complete.

At the end of the survey all participants will be re-directed to a separate link where they will have the option of providing their full name and email address if they wish to be contacted to participate in future research. This is entirely optional and participants are under no obligation to provide consent. As names and contact details will be collected and stored separately from the survey results, all survey data will be unidentifiable.

In the event of the results from this study being published in a psychological journal, only group statistics, such as overall percentages and averages will be used, meaning that it would be impossible to identify individual responses. Results from this study will also be used in the student researcher’s PhD thesis. These data will be retained under secure conditions for seven years after the completion of the study.

By completing this questionnaire you are expressing your consent to participate in this study. You are free to withdraw from the completion of this questionnaire at any time, and any questions regarding this project can be directed to:

Brad Elphinstone (belphinstone@swin.edu.au)

or my Supervisor:

Associate Professor Christine Critchley (03) 9214 5480
Psychology Department
Faculty of Life and Social Sciences
ccritchley@swin.edu.au

If for any reason you experience any form of psychological distress as a result of completing the survey and would like to receive low cost counselling, please call the Swinburne Psychology Clinic (9214 8653, psychclinic@swin.edu.au). Swinburne students can access Swinburne Student Services Counselling for free (9214 8025), or if you are unable to contact a counsellor and require help, please phone Lifeline (131 114).

This project has been approved by or on behalf of Swinburne’s Human Research Ethics Committee (SUHREC) in line with the National Statement on Ethical Conduct in Human Research. If you have any concerns or complaints about the conduct of this project, you can contact:

Research Ethics Officer, Swinburne Research (H68),
Swinburne University of Technology, P O Box 218, HAWTHORN VIC 3122.
Tel (03) 9214 5218 or +61 3 9214 5218 or resethics@swin.edu.au

Thank you for your valued contribution to the study,
Brad Elphinstone
Demographic Information

1. What is your age in years?

2. What is your gender? (Male/Female)

3. Which country do you currently reside in?

4. Which country was your mother born in?

5. Which country was your father born in?

6. Which culture do you most identify with? (e.g., Australian, Chinese, Indian, British)

7. What is the highest educational level you have successfully completed so far?
   a. Primary
   b. Some secondary
   c. Completed Secondary
   d. Trade qualification
   e. TAFE or Diploma level
   f. Incomplete undergraduate study
   g. Complete undergraduate study
   h. Postgraduate

8. If you are currently attending university, or completed a degree in the past, what degree did you study? If you did not attend university, what field are you working in now?

9. What is your level of income?
   a. $0-$10,000
   b. $10,001 - $20,000
   c. $20,001-$30,000
   d. $30,001-$40,000
   e. $40,001-$50,000
   f. $50,001-$60,000
   g. $60,001-$70,000
   h. $70,001-$80,000
   i. $80,001-$90,000
   j. $90,001-$100,000
   k. $100,001-$250,000
   l. $250,001-$500,000
   m. $500,001-$1,000,000

10. Please select which is most representative of your current employment.
    • Primarily a student (could also be working part time or on a casual basis to support your education)
    • Casual
    • Part time
    • Full time
    • Unemployed
    • Retired
    • Home Duties
11. Which type of religious belief do you most identify with? (e.g., Catholic, Muslim, Anglican, Jewish, Atheist, etc)

12. Apart from special religious ceremonies like weddings and funerals, how often do you attend religious services?
   - Never
   - Less than once a year
   - At least once a year
   - Several times a year
   - At least once a month
   - At least once a week

13. Please record the political party you voted for in the most recent National/Federal election

14. In political matters, people talk about ‘the left’ and ‘the right’. On a scale from 1 to 10 where 1 = Left and 10 = Right, where would you place your views generally speaking?
This is a questionnaire about how people relate to their world. Listed below are pairs of statements concerning thoughts, attitudes, and ways of behaving.

Please read each statement carefully and find the one which pertains to you more closely. No statement is more "correct" than the other.

An answer sheet is provided for your responses. Please answer all items, but select only one statement ("a" or "b") in each pair. (NOTE: Organismic Mechanistic Paradigm Inventory).

1)  a) Schools should be where a child learns to think for him/herself.
    b) Schools should be where a child learns basic information.

2)  a) Things really look different if we change how we see them.
    b) Things really look different only if they are changed.

3)  a) Organisms change by forces from outside themselves.
    b) Organisms can change themselves.

4)  a) A good judge is purely objective.
    b) A good judge is not objective and knows it.

5)  a) Great discoveries come from scientific imagination.
    b) Great discoveries come from scientific experimentation.

6)  a) All things stay basically the same over time.
    b) All things change from one moment to the next.

7)  a) A business executive needs time to analyze the facts.
    b) A business executive needs time for creative thinking.

8)  a) Before making a big decision, I like to sleep on it.
    b) Before making a big decision, I like to get all the information.

9)  a) Progress in science occurs when there is a new way of looking at events.
    b) Progress in science occurs when an important observation is made.

10)  a) A criminal is just a burden to society.
     b) A criminal has a function in society.

11)  a) Our knowledge is limited by our observations.
     b) Our knowledge is limited by our imagination.

12)  a) Living is a process of using up the available supplies.
     b) Living is a process of exchanging supplies back and forth.

13)  a) Events are sometimes just the same as before.
     b) Events are always new and different in some way.

14)  a) Divorce is often a phase in each partner's growth.
     b) Divorce is usually the result of incompatible personalities.

15)  a) Facts are more useful than a good idea.
     b) Facts are less useful than a good idea.
16) a) Each relationship I have is different.
b) Each relationship I have is much like the previous one.

17) a) Things are changed only when they are directly affected.
b) Things are changed by everything else.

18) a) We learn by carefully examining individual facts.
b) We learn by finding order in an array of facts.

19) a) To live independently of other people is not a realistic goal.
b) To live independently of other people is a realistic goal.

20) a) War can be understood by examining what purpose it served.
b) War can be understood by examining its causes.

21) a) The world is like a large, living organism.
b) The world is like a large, complex machine.

22) a) A child discovers the world by being praised and punished.
b) A child discovers the world by testing his/her dreams and fears.

23) a) I can change things in my family only by planned action.
b) I can change things in my family just by being who I am.

24) a) A child’s world is different from mine.
b) A child’s world is like mine, but he/she knows less.

25) a) Persons are made by their environments.
b) Persons and their environments affect each other.

26) a) To resolve a family dispute, it is important how we look at the facts.
b) To resolve a family dispute, it is important to discover all the facts.

Note: The following items were included at the end of the OMPI items and were used to comprise the MHPI.

1) a) If two people are arguing about something, they might both be right, if you consider both perspectives
b) If two people are arguing about something, one of them must be wrong.

2) a) Reality is subjective and different for all people.
b) There is a single objective reality which is true for all people.

3) a) We do not see the world for what it is, but how we are.
b) There is a single objective truth, no matter what perspective you take.

4) a) There is not always one ‘right’ answer, just different perspectives.
b) There is always a ‘right’ answer and a ‘wrong’ answer.

5) a) Most things in life are in a constant state of flux and change.
b) Most things in life remain constant and unchanging.
6) a) The universe, like a living organism, consists as a system of complex, interrelated processes.
b) The universe, like a machine, consists of separate parts that work together.

7) a) Society is a result of all people connected as a whole.
b) There is no such thing as society, just individuals and their families.

8) a) Organisms shape, and are shaped by, their respective environments.
b) Organisms are independent of their respective environments.

9) a) It is not possible to be completely independent in society; all people rely on others one way or another.
b) It is completely possible to be independent in society without relying on anyone.

Thank you very much for participating in this survey.

Would you like to be included on our database of people who are willing to be contacted at a later date to participate in future research?

1. Yes (Go to Details)
2. No (Go to end of survey)

Details:

First name:

Phone:

Email:
Appendix D

Ethics clearance for Study 1:

Dear Christine and Brad,

SUHREC Project 2011/214 Investigating the relationship between motivation, attitudes, and psychological well-being
Dr C Critchley, Mr Brad Elphinstone FLSS
Approved duration: 30/09/2011 To 28/02/2012 [Adjusted]

I refer to the ethical review of the above project protocol undertaken by Swinburne's Human Research Ethics Committee (SUHREC). Your responses to the reviews, as e-mailed on 23 and 28 September 2011, were put to and approved by a SUHREC delegate.

I am pleased to advise that, as submitted to date, the project may proceed in line with standard on-going ethics clearance conditions here outlined.

- All human research activity undertaken under Swinburne auspices must conform to Swinburne and external regulatory standards, including the current National Statement on Ethical Conduct in Research Involving Humans and with respect to secure data use, retention and disposal.

- The named Swinburne Chief Investigator/Supervisor remains responsible for any personnel appointed to or associated with the project being made aware of ethics clearance conditions, including research and consent procedures or instruments approved. Any change in chief investigator/supervisor requires timely notification and SUHREC endorsement.

- The above project has been approved as submitted for ethical review by or on behalf of SUHREC. Amendments to approved procedures or instruments ordinarily require prior ethical appraisal/clearance. SUHREC must be notified immediately or as soon as possible thereafter of (a) any serious or unexpected adverse effects on participants and any redress measures; (b) proposed changes in protocols; and (c) unforeseen events which might affect continued ethical acceptability of the project.

- At a minimum, an annual report on the progress of the project is required as well as at the conclusion (or abandonment) of the project.

- A duly authorised external or internal audit of the project may be undertaken at any time.

Please contact me if you have any queries about on-going ethics clearance. The SUHREC project number should be quoted in communication. Chief Investigators/Supervisors and Student Researchers should retain a copy of this email as part of project record-keeping.

Best wishes for project.

Yours sincerely,
Ann Gaeth For Keith Wilkins
Secretary, SUHREC
Ethics clearance for Study 2:

To: Dr Christine Critchley, FLSS; Mr Brad Elphinstone

SUHREC Project 2012/090 Investigating the metaphysical correlates of human flourishing and well-being Dr Christine Critchley, FLSS; Mr Brad Elphinstone Proposed Duration: 23/05/2012 To 31/12/2012 [Adjusted]

I refer to the ethical review of the above project protocol by Swinburne's Human Research Ethics Committee (SUHREC). Your responses to the review, as emailed on 9 May 2012 with attachments, were put to the SUHREC delegate and feedback sent to you. Your revised ethics application, consent information statements and attachments emailed on 15 May 2012 accords with the feedback.

There being no other modifications, I am pleased to advise that, as submitted to date, the project may proceed in line with standard on-going ethics clearance conditions here outlined.

- Please ensure that the consent information statements and forms are printed with the Swinburne logo, and copies sent to the Research Office for our files.

- All human research activity undertaken under Swinburne auspices must conform to Swinburne and external regulatory standards, including the National Statement on Ethical Conduct in Human Research and with respect to secure data use, retention and disposal.

- The named Swinburne Chief Investigator/Supervisor remains responsible for any personnel appointed to or associated with the project being made aware of ethics clearance conditions, including research and consent procedures or instruments approved. Any change in chief investigator/supervisor requires timely notification and SUHREC endorsement.

- The above project has been approved as submitted for ethical review by or on behalf of SUHREC. Amendments to approved procedures or instruments ordinarily require prior ethical appraisal/ clearance. SUHREC must be notified immediately or as soon as possible thereafter of (a) any serious or unexpected adverse effects on participants and any redress measures; (b) proposed changes in protocols; and (c) unforeseen events which might affect continued ethical acceptability of the project.

- At a minimum, an annual report on the progress of the project is required as well as at the conclusion (or abandonment) of the project.
- A duly authorised external or internal audit of the project may be undertaken at any time.

Please contact the Research Ethics Office if you have any queries about on-going ethics clearance, citing the SUHREC project number. Copies of clearance emails should be retained as part of project record-keeping.

Best wishes for the project.

Yours sincerely
Sheila Hamilton-Brown for Keith Wilkins
Secretary, SUHREC
Ethics clearance for Study 3:

To: Dr Christine Critchley, FLSS/ Mr Bradley Elphinstone

Dear Dr Critchley,

**SUHREC Project 2012/303 Assessing the relationship between lay theories of reality, parenting styles, aspirations, and well-being**

Dr Christine Critchley, FLSS/ Mr Bradley Elphinstone
Approved Duration: 10/01/2013 To 10/08/2013 [Adjusted]

Project Modification: March 2013

I refer to your e-mail of 12 March 2013 in which you requested a modification to the project by the addition of a questionnaire to the research instruments and a replacement project title (inserted above). The documentation was reviewed by the SHESC delegate.

I am pleased to advise that, as submitted to date, the modified project/protocol may continue in line with standard ethics clearance conditions previously communicated and reprinted below.

Please contact me if you have any queries about on-going ethics clearance, citing the SUHREC project number. Copies of clearance emails should be retained as part of project record-keeping.

As before, best wishes for the project.

Regards

Kaye Goldenberg

Secretary, SHESC (Composite)
I, Brad Elphinstone, declare that all studies were conducted in accordance with the ethical guidelines mandated by the Swinburne University Human Research Ethics Committee in accordance with the National Statement on Ethical Conduct in Human Research. All subsequent final reports have been submitted.

Name: BRAD ELPHINSTONE

Signature: 

Date: 06/01/15