AN EXAMINATION OF INTELLECTUALISM AND THE TALL POPPY SYNDROME IN THE AUSTRALIAN CONTEXT: INVESTIGATING ATTITUDES TOWARDS SCIENTISTS USING A VALUES FRAMEWORK AND CONTEXTUAL INFORMATION

Mathew Da Costa Marques

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Swinburne University of Technology

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Abstract

The number of Australians leaving our shores for overseas sparked a number of political and media enquiries. Reasons put forward for this reported exodus included claims that highly skilled workers were leaving as a result of a peculiar cultural ideology which accounts for the suspicion of persons of high status or achievement, labelled The Tall Poppy Syndrome. This thesis reports three studies which examine the reasons why individuals might perceive the success of high achieving intellectuals in a negative way. It also examines the impact of existing theories of deservingness, values, anti-intellectualism, and the role of context on the perception of intellectual high achievers. Participants from both university and wider population samples took part in a pilot study ($N = 25$), two paper and pen vignette studies ($N = 285$; $N = 194$), and a combined national telephone and follow-up survey ($N = 458$). Overall these studies investigated attitudes towards intellectual high achievers, with a particular emphasis on scientists working in emerging scientific areas. Structural Equation Modelling and Multilevel Modelling were used to test a series of interrelated hypotheses that sought to establish whether: i) intellectuals were susceptible to aspects of the Tall Poppy Syndrome; ii) if values relating to intellectual activities and ideals were a better predictor of attitudes towards intellectual high achievers, such as scientists, when compared with a measure of generalised attitudes towards tall poppies; and iii) how information relating to a scientist's intellectual motivations as well as the context that they work in influences attitudes towards them. Firstly, it was found that intellectual high achievers were quite distinct from non-intellectual high achievers as they were generally rated favourably on a set of personality and moral characteristics. The variation in positive attitudes across the two groups was significantly predicted by judgements relating to how the high achiever had attained their position (i.e., deservingness). Positive attitudes across the two groups of scientists were also associated with a need for intellectual stimulation which was in turn predicted by Conservation values. Support for the fall of tall poppies in general significantly and positively predicted a favourable attitude towards scientists in general also over and above that predicted by a positive attitude to the pursuit of intellectual activities. Finally, attitudes towards scientists working in emerging technologies differed

significantly based on the type of science being carried out. It was found that attitudes towards scientists working in Human Embryonic Stem Cell Research were less favourable when compared to those working in Nanotechnology. However, there were no significant differences in attitudes across scientists based on their intellectual motivations, despite some significant two-way interactions and main effects demonstrating the importance of type of science, values and attitudes towards intellectual activities. It was concluded that judgements of intellectual high achievers such as scientists were not a product of the tall poppy syndrome, and that individual level predictors as well as contextual factors were important in determining public support for scientists working in emerging technologies. Moreover, scientists were distinct from a traditional tall poppy classification given they were perceived as hard working and deserving of their positions, and intellectual. The practical implications of the research included raising the awareness and value of the nation's intellectual high achievers, promoting a greater level of trust in scientists carrying out complex emerging research, and promoting public support for science through the volunteering of time or services.

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Declaration

This is to certify that:

(i) this thesis compromises only my original work,
(ii) due acknowledgement has been made in the text to all other material used,
(iii) this thesis is less than 100,000 words in length, exclusive of tables, appendices, references and footnotes.

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CHAPTER 1

THE AUSTRALIAN INTELLECTUAL CLIMATE

1.1 The Brain Drain and the Foreign Poppy Syndrome

Recently there has been discussion about the increasing number of Australians leaving our shores for overseas, many of them never set to return. Referred to by the popular media as the *expat brain drain* (Carvajal, 2004) or the *foreign poppy syndrome* (Skelton, 2004), this civic diaspora should be an important issue for the Australian populace given its impact on our culture. This importance can be gauged by a recent parliamentary enquiry (The Senate, 2005) into the extent of the emigration from Australia and associated research (Flutter & Fullilove, 2004).

The terms of reference set up by the Australian Senate Legal and Constitutional References Committee (The Senate, 2005) investigated the extent of Australian emigration, and associated factors driving more Australians to live overseas. Of the hundreds of expatriate submissions in response to the invitation for public comment, several referred to the tall poppy syndrome as a reason they felt uncomfortable about returning to Australian shores. One such report spoke of having to justify any suspicions of tax evasion or earning, or any other 'sins' that follow the tall poppy syndrome (Tyler-West, 2005), whilst another submission felt that her artistic talent and herself would not be welcomed back in Australia despite feeling welcome in any of the other countries in which she had lived (Fox, 2005). The Tall Poppy Syndrome is defined by the *Oxford English Dictionary* (OED; Simpson & Weiner, 1989) as a perceived tendency to discredit or disparage those who have achieved notable wealth or prominence in public life.

A recent paper (Flutter & Fullilove, 2004) from the Lowy Institute, an Australian policy think tank, discussed public attitudes towards expatriates. This report by Flutter and Fullilove investigated the idea that there is no regard for criticism about local affairs from expatriates, labelling this the 'foreign poppy syndrome'. Through a random survey of 1,000 Australian residents it found that

an overwhelming majority (75%) agreed that expatriates "are doing well for themselves away from home", and a small minority agreed with the statements that expatriates "have let us down by leaving Australia" (10%) and that expatriates "too often delight in running Australia down from offshore" (14%). So whilst there may have been an outcry in the media and other public circles about the negative repercussions of this apparent exodus, it seemed that on the whole people were comfortable with criticism relating to Australia from those now living overseas.

It is interesting to note however, that in Flutter and Fullilove's (2004) research 24 per cent of people thought "the number of Australian working overseas represents an alarming brain drain of talent from this country". Despite the somewhat loaded question, in the use of the term 'alarming', a sizeable proportion greater than what was reflected in Flutter and Fullilove's report may have expressed discontent at one such ramification of the tall poppy syndrome. That is, that the brain drain of talent from the country only refers to a specific subset of highly educated emigrants. This concern is also echoed from those in scientific circles, perhaps anecdotally, that scientists claim top-level researchers are attracted to other countries due to feeling undervalued and under-funded (Birrell, Dobson, Rapson, & Smith, 2001).

Birrell et al. (2001) examined the migration of skilled workers to and from Australia in light of the so called brain drain. Whilst it was reported that the loss of skilled residents was offset by occupation gains from new workers, the lack of details in the qualitative data on the emigrants might have suggested that highly skilled workers are being replaced with lower quality settlers. A similar report by the Australian Chamber of Commerce and Industry (ACCI; 2004) found that some of the qualities that Australian expatriates have over those who remain at home are higher education and better work skills. According to the ACCI, income differentials or career opportunities appear to be a driving force in this diaspora given that average overseas salaries can often be twice the amount of local ones. This resonates closely with a report prepared for the Chifley Research Centre (CRC; Boyd, 2001), where it was found that amongst a survey of Australian scientists and academics that a lack of research funding in Australia was near the top of the list of reasons to seek work in a foreign nation.

The concerns expressed by 174 researchers from universities and other organisations in the CRC report (Boyd, 2001) stemmed from a loss of its members to overseas institutions and to the ability to recruit qualified staff and researchers. The quantitative survey supported the qualitative remarks made by senior and younger researchers that superior research facilities and funding are the strongest attractions to move overseas, followed by better salaries and conditions for the more established researchers and better career growth opportunities for the up and coming researchers. Furthermore, the difficulties in recruitment of talented researchers from both Australian and overseas due to a low salary structure and research funding, coupled with its associated exodus of talented workers, could reflect an general undervaluing of the nation's scientists.

In the general community at large, it could be argued that the effect of the brain drain is outweighed by gained overseas benefits (e.g., promoting economic, social and cultural interests overseas). Nevertheless, the same cannot be said of the academic circles where the anecdotal claims made by scientists that skilled researchers are leaving to work overseas are supported by research (e.g., Boyd, 2001). Whilst it cannot be directly substantiated from these reports, it is argued here that the foreign poppy syndrome is intertwined with the difficulty of obtaining talented researchers in Australian universities (Boyd, 2001). It is probable that the foreign poppy syndrome is not relevant to all expatriates, but only to a subset that might be associated with the so-called 'brain drain'. As such, it is important to investigate the antecedents relating to why scientists and academics in Australia are undervalued, by looking at contextual determinants of the Tall Poppy Syndrome.

1.2 Aims of the Thesis

Given the present climate relating to an emigration of skilled workers, this thesis will draw upon theoretical and empirical research in an attempt to understand whether perceptions of tall poppies are linked to perception towards scientists. In Chapter 2, existing theoretical knowledge relating to the perception of Tall Poppies, as well as empirical findings, are presented in order to establish whether these principles are applicable to intellectuals. That is to say, most of the research into Tall Poppies (e.g., Feather, 1994a) has focussed on non-

intellectuals. Thus, the primary aim of this thesis is to establish whether certain intellectuals are considered to be Tall Poppies, or indeed if there are some theoretical principles from the literature that can be applied in order to understand attitudes towards them. This is examined in a Pilot Study and in more detail in Study 1, both of which are presented in Chapter 5.

Chapter 3 will examine the literature relating to anti-intellectualism. As this is an area that has received little attention in psychology, this thesis will look at research and theory from fields such as sociology, politics, as well as general social commentary in an attempt to capture and communicate the seemingly elusive nature of anti-intellectualism. In particular, ideas from the American work of Hofstadter (1963) are used to inform the concept of anti-intellectualism given that this area has received little or no attention in psychological literature until more recent times (e.g., Eigenberger & Sealander, 2001). Furthermore, due to a lack of research detailing anti-intellectualism in Australia, and more generally in the field of psychology, this thesis will examine the American literature and take a multidimensional approach to understand attitudes towards Australian intellectuals. The argument will also be made that intellectuals could be thought of as Tall Poppies, and as such this thesis will examine whether values and attitudes relating to anti-intellectualism are a better predictor of attitudes towards intellectuals when compared with existing Tall Poppy measures. This is tested in Study 2, which is presented in Chapter 6.

The third and final major aim of this research is to investigate the effect context and perceived motivations have on attitudes towards scientists, who could be considered examples of intellectual Tall Poppies. Given the lack of research investigating the effect of context on the perception of Tall Poppies (Feather, 1994a), this thesis will examine how the type of science carried out by the scientist influences attitudes towards these intellectuals. Furthermore, the effect of intellectual motivations described in scientists on attitudes will be investigated. These analyses and results are examined in Chapter 7.

CHAPTER 2

TALL POPPY THEORIES AND RESEARCH

2.1 Overview of the Chapter

The claims echoed by the Senate enquiry into expatriates (The Senate, 2005) give rise to the possibility that the peculiar Australian ideology known as the Tall Poppy Syndrome may be an important factor at play in the brain drain. Coupled with pre-existing reports (Birrell, et al., 2001; Flutter & Fullilove, 2004), which suggest that the emigration of highly educated and skilled workers could be a result of being undervalued and underpaid, it is important to assess the current perception of high achievers in our society, especially those that are viewed as being well educated or intellectual.

This chapter reviews the literature relating to the Tall Poppy Syndrome. Firstly, it examines the historical context and existing research that has attempted to define a Tall Poppy, which is important given the metamorphosis of the term in recent times. Secondly, this chapter will review existing research into the Tall Poppy Syndrome in the context of established psychological frameworks and theories in order to highlight the importance of key constructs, as well as the unresolved questions relating to the perception of high achievers. Finally, in light of the theoretical and empirical research on traditional Tall Poppies, new areas of research relating to context and intellectualism are suggested as important in understanding the perception of intellectual Tall Poppies.

2.2 General Definitions and Historical Setting

According to Peeters (2003) the evolution of the term ‘tall poppy’ within Australian culture is one worthy of attention, having distinctive roots within the Anglo-Celtic origins of the nation. The use of this distinctively Australian phrase over the past 100 or so years has shifted from a reference to a high-income earner to that of a public figure of status. The origins of the tall poppy can be traced back a few thousand years to a Roman historian named Livy (born around 60 B.C., died 17 A.D.). Feather (1994a) recounts the tale of a Roman

ruler named Tarquinius who walked up his garden with his stick, cutting the tall poppies as symbolism for the removal of his rivals. This message was then relayed to his son, Sextus Tarquinius, who interpreted this gesture as a displacement of the leaders of Gabii, which had so far resisted Roman rule. In this instance the term Tall Poppy was used where the other target is a direct competitor, and the act of cutting them down is motivated by the pursuit of power and self-interest. These days the term does not reflect this brutal ancient Romanic practice of eliminating direct rivals by an almost literal lopping off of the head, but rather one of a pejorative nature used towards distant public figures.

The earliest known usage of the term tall poppy in Australia was noted at the turn of the 20th century by Nielsen (1902) who wrote that "the 'tall poppies' were the ones it was desired to retrench, but fear was expressed that, as usual, retrenchment might begin at the bottom of the ladder, and hardly touch those at the top at all" (p. 8). Peeters (2004a), who wrote about the usage of the term in Australian history, interpreted this to mean that the essential quality about the tall poppy did not relate to success or status, but to a high-income earner who placed a burden on the payroll. A few decades later and the work of Hancock (1930) reshaped the way that Australians thought of their tall poppies. According to Feather's (1989a) analysis of Hancock, at the time Australian society provided "a 'fair and reasonable' standard of living for everyone, accompanied by a distrust for special excellence and a dislike of authority and status seekers" (p. 242). So whilst the term was briefly a reflection of a high earning person in public office, it was broadened to cover any individual of influence or ability that was in the public spotlight.

The current meaning of the term can be evidenced from the modern lexicon by which the Tall Poppy is described. The *OED* (Simpson & Weiner, 1989) defines a Tall Poppy as "an especially well-paid, privileged, or distinguished person", and the *Australian National Dictionary* (AND; Ramson, 1988) as a "person who is conspicuously successful" and frequently as "one whose distinction, rank, or wealth attracts envious notice or hostility". Whilst the *OED* and the *AND* definitions both reflect on the target's resources as well as the regard for their achievements, skill, knowledge or talent, the latter definition adds the resentment that is sometimes synonymous with them. Another definition from the *Dinkum Dictionary* (Johansen, 1988) refers to a tall poppy as

a “very important person; influential person; person with status – often held in contempt by others, who try to bring about this person’s downfall or ruin”. So whilst the tall poppy is attributed some particular characteristics relating to success or monetary wealth, the term also commonly goes hand in hand with a negative evaluation of their position followed by a subsequent reaction.

2.2.2 Examples of Tall Poppies in Australian culture

Peeters (2004a) described the quintessential depiction of a tall poppy in the Australian media. A cartoon by Mark Lynch in The Australian on 28 June 1989 showed a successful businessman, Alan Bond, whose empire had begun to collapse with the caption “Australians enjoying their favourite sport”. The cartoon (see Figure 2.1) “showed his face at the top of a huge poppy stem in the process of being sawn off, with numerous onlookers with handsaws, chainsaws, even a bulldozer on the one side, and a host of reporters on the other side” (Peeters, 2004a, p.12). Whilst it is generally accepted that businesspersons, politicians, and some sportspersons are candidates for the moniker of tall poppy (Feather, 1994a), other public figures such as artists and writers may not be (Peeters, 2004b).

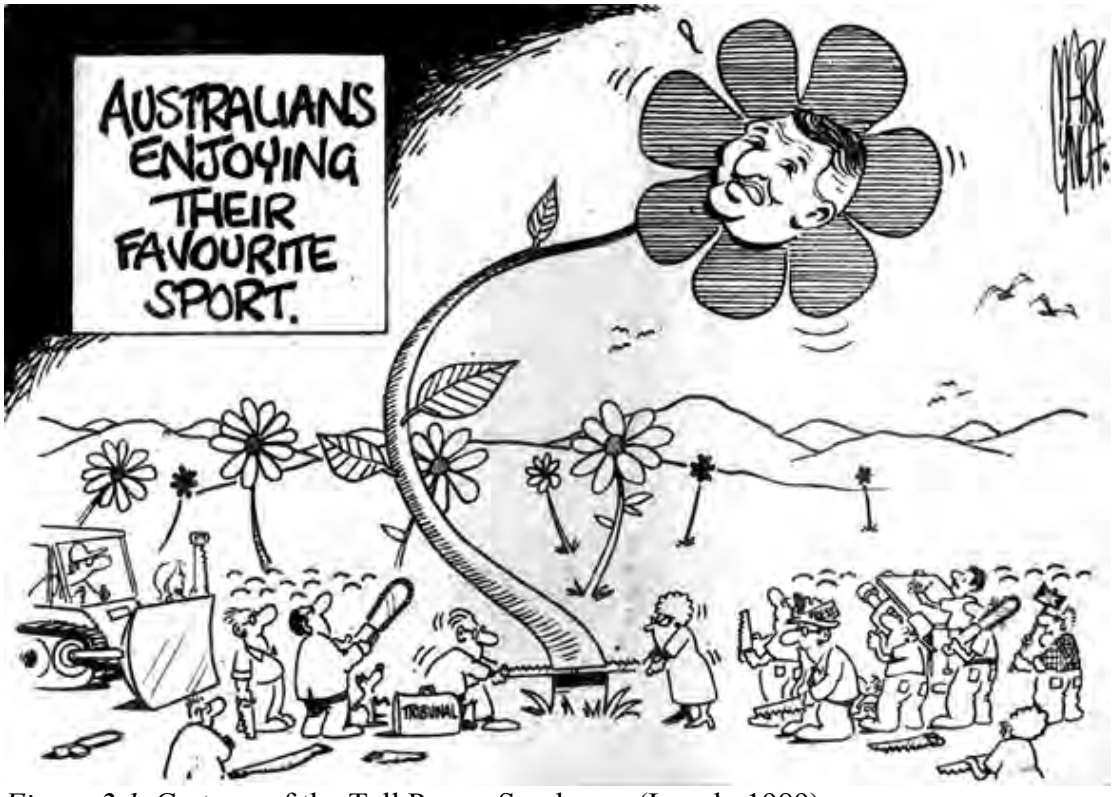

Figure 2.1. Cartoon of the Tall Poppy Syndrome (Lynch, 1989).

In response to a question from a journalist as to whether philistinism was the reason why Australians disliked artists and writers, Australian painter Sidney Nolan remarked that Australians disliked tall poppies and not these intellectuals (Peeters, 2004b). Several interesting questions arise from this statement. For instance, is there a link between philistinism and tall poppies, and what is its nature? Furthermore, are artists and writers immune from tall poppy status, and what makes this so? To answer these questions one first needs to examine the Australian climate and its relationship with philistinism.

According to the OED a philistine can be defined as a person devoted narrow-mindedly to material prosperity at the expense of intellectual and artistic awareness; or ignorantly uninterested in culture and ideas (Simpson & Weiner, 1989). This notion of Australian society as a philistine culture has been supported by Peeters (2004b), with accounts by Australian historians about tall poppies (see Ely, 1984, for a review). For example, Esson (1939) wrote of pre World War I Australia as a crude and materialistic place, where it was difficult for anyone with artistic ideas to make a living because the country had no culture. When speaking about Australian painting, art historian Bernard Smith expressed a need to comprehensively explore the history of philistinism in Australia and its role "in moulding the Australian culture as an anti-art culture" (Smith, 1974, p. 290). Yet Ely also presented an opposing view where Wilkes (1981) believed Australian philistinism to be the "dominant myth of the twentieth-century" (p. 144). Both Ely and Peeters argue that this paradox in the existence of philistinism in Australian culture was due differences in the use of the term philistine, for which the latter author offered a linguistic means of resolution (see Peeters, 2004b, for a review). The focus here is the inclusion of artists, painters, and writers, as members of the tall poppy genus. So it could be argued then that the discussed links between philistinism and tall poppies are only relevant to those tall poppies within the intellectual sphere, and not businesspersons or sportspeople for whom the label is also used frequently.

If it is held true that Nolan's statement about intellectuals being immune to the tall poppy syndrome, there are arguably different personality characteristics or qualities by which people evaluate distinct groups of high achievers. This is most evident when one thinks of the divide in how different

high achievers are perceived in Australian society. The following section provides examples of high achievers from different fields who have suffered from the tall poppy syndrome, and highlights the commonality between them.

At the passing of one of Australia's greatest sporting legends, it was commented that Sir Donald Bradman would never become a victim of the Tall Poppy Syndrome. Feather commented that Bradman had a strong character, and "deserved his status, something you can't say of all tall poppies, so no one will want to see him fall" ("Sir Donald Bradman 1908-2001; Tall poppy never to be cut down," 2001, p.8). This is not atypical, as sportspersons are often seen to have earned their accolades through countless hours of training and effort. Lleyton Hewitt, a former number one tennis player, on the other hand may have at times been vying for the tall poppy syndrome given his on-court and off-court antics. An incident in his home town at the Adelaide Open in 2000 saw him call the Australian public stupid after a match where the audience was cheering the opponent and heckling Hewitt after a disputed line call (Linda, 2001). Thus, in his case the evaluation of him overlooked his hard work and effort to obtain his achievement, and focussed on his demeanour and character. These are but two examples where high achieving sportspersons, both deserving of their success given their efforts to reach the pinnacles of their chosen sports, are tall poppies. However, in the case of Lleyton Hewitt he was derided and fell prey to the tall poppy syndrome, most likely due to his display of unfavourable personality characteristics.

The importance of understanding the relationship between aspects of personality and the tall poppy syndrome is detailed further. For instance, former HIH Insurance director, Rodney Adler, suggest that he had been a victim of the tall poppy syndrome (Packham, 2001). Following the biggest corporate downfall in the history of Australia, Adler referred to his situation and treatment following the collapse as having been influenced by his tall poppy status. In the Sydney's *Daily Telegraph* Maguire (2004) noted the frequency of self-proclamations by businesspersons, politicians, and some sportspersons as sufferers of the tall poppy syndrome. As noted in Maguire's report, these declarations of unwarranted susceptibility to the tall poppy syndrome are mere sophistry for the arrogance that unifies all these attacks on those of status. Thus, it would appear that unfavourable personality characteristics exhibited by high achievers, and

those of status, are important for the public to make judgements of these tall poppies.

2.2.3 Empirical attempts to define Tall Poppies

At present there are two major viewpoints about the meaning of the term tall poppy, and whether it is a neutral or a negatively value laden expression. Feather has conducted an extensive research program (e.g., 1994a, 1996, 1999a) framed by psychological theories in order to understand what influences attitudes towards tall poppies. Feather's investigations into tall poppies stem from an interest in understanding the variables that influence the generalised attitudes towards high achievers (Feather, 1989b, 1994a). Whilst Feather uses the term tall poppy in a neutral manner, recent research by Peeters (2003, 2004a, 2004b, 2004c) that is linguistics based has argued that the term is primarily associated with a negative evaluation or desired outcome for the target. Expressions like cut down (or off), lop, pull out, prune, fell, sever, and other terminology that involve the adverb down are used frequently (Peeters, 2003). Peeters (2004b) emphasises that the term needs to be re-evaluated, given claims that work by Feather (e.g., 1989a; 1994a, 1996) has misused the expression.

Drawing on the commonly held belief that Australians enjoy seeing those in high positions suffer a fall, Feather has investigated the various factors that influence the perception of high achievers. This includes the situational context of the high achiever (Feather, Volkmer, & McKee, 1991), whether he or she deserves that position (Feather, 1992), and the effect of a perceiver's values and needs on judgements of tall poppies (Feather, 1996). Often the negative attitudes towards the high achiever are explored through the reactions to the change in status of these individuals (e.g., Feather, 1989a). For example, a businessperson who has gone bankrupt, a television personality that has lost public appeal, a sportsperson caught using a performance enhancing substance, or other high profile figures who have suffered a fall.

The term tall poppy has evolved in Australia over the past 100 years, and according to Peeters (2003), the present definition is one that should be synonymous with a negative evaluation of a public figure. In keeping with its historical roots from ancient Roman times, Feather (1994a) sees the term as

linked with the success of an individual at the expense of another when those involved are competing for a valued outcome. The departure from Peeters' (2004a, 2004c) interpretation however, is that Feather's use of tall poppy is distinctively neutral and synonymous with a person of status who is a high achiever. On the surface the point may well seem valid, that the term tall poppy is usually interpreted or used in a pejorative manner and should be represented accordingly. However, Feather (1989a) is interested in exploring the good and bad high achievers, and as such is concerned with leaving the evaluation as being subjective. In particular, Feather's research is interested in understanding why people may hold ambivalent attitudes towards tall poppies. Similarly, Peeters (2004c) concedes that not all tall poppies are cut down, especially those in sport. So it may be that Feather is justified in using the term in a neutral manner if it allows for the study of what factors lead to good or bad tall poppies.

2.3 Psychological theories and research examining Tall Poppies

Feather (e.g., 1994a, 1996, 1999a) has carried out extensive research from a psychological perspective into the tall poppy phenomena. The present thesis is not only shaped by the methodology used in the numerous studies of these public figures, but also by the theoretical underpinnings that are drawn upon to explain attitudes towards these particular tall poppies. This section will begin by providing a functional definition of attitudes, and move onto a review of Feather's research, with emphasis on the studies and theoretical ideas that have influenced the present research examining attitudes towards tall poppies. Outside of the empirical and theoretical research by Feather, there is little work investigating the tall poppy syndrome. Firstly, this section will present the major theories found to be relevant to understanding the tall poppy syndrome. Secondly, empirical research often carried out by Feather is presented to provide specific examples and highlight the importance of the theories to the present questions. Finally, after a critical analysis of these studies, further directions for the present research will be discussed.

2.3.1 A functional definition of attitudes

Attitudes have been central to social psychology since the 1920s. Thurstone (1928) proposed that attitudes could be measured, and provided the foundations for modern techniques of attitude measurement. In addition, Allport (1935) described the attitude as the "most distinctive and indispensable concept in American Social Psychology" (p. 198). There is general agreement that an attitude is a psychological tendency that represents an evaluation of a psychological object with some degree of favour or disfavour (e.g., Ajzen, 2001; Eagly & Chaiken, 1993; Petty, Wegener, & Fabrigar, 1997). A tendency is an internal state that can last for a short time and other times be relatively stable, whilst an evaluation is the amount of favour or disfavour towards a psychological object (Eagly & Chaiken, 1993). The evaluation is always made with respect to the psychological object, which can be any object of thought, either abstract (e.g., intellectualism, high achiever) or concrete (e.g., scientist, embryonic stem cell cloning). Furthermore, attitudes differ from opinions or beliefs, which are thought to provide the building blocks of attitude formation (Fishbein & Ajzen, 1974).

Attitudes can also be thought of as functional, serving important personal and social needs and goals (Eagly & Chaiken, 1993). As such, attitudes can serve various psychological needs and vary in their motivational bases. Both Katz (1960) and Smith, Bruner, and White (1956) proposed that for there to be a change in an attitude the change procedures must match the functional basis of the attitude one is trying to change. Katz proposed that for any given attitude there were four distinct personality functions: a utilitarian function, a knowledge function, an ego-defensive function, and a value-expressive function.

The utilitarian function, also known as the "instrumental" or "adjustive function", is based on behaviourist principles such that people are motivated to gain rewards and avoid punishment from their environment. Utilitarian attitudes serve to maximise positive outcomes whilst minimising negative outcomes (Katz, 1960). The knowledge function is based on Gestalt principles, and presumes that people are motivated to understand and give structure to the world. In this way, attitudes serve to simplify and provide clarity and structure to simplify the often complex or ambiguous environment. The Ego-defensive

function of attitudes is based on the "psychoanalytic principle that people use defence mechanisms such as denial, repression, and projection to protect their self-concepts against internal and external threats" (Eagly & Chaiken, 1993, p. 480-481). Thus, attitudes enable people to defend their images of the self and cope with emotional conflict. Sometimes this is managed by unconsciously projecting one's own feelings of inferiority onto others. The value-expressive function of attitudes serves to provide satisfaction from the expression of the individual's personal values and other aspects of the self-concept. As a result, people seek to express and clarify their true nature by expressing their central values.

2.3.2 Values theory

Distinct from attitudes, beliefs, or needs, values are believed to transcend particular objects and situations. Rokeach (1973, 1979) described values as general beliefs that people hold about desirable and undesirable modes of conduct and end states of existence, termed instrumental values and terminal values respectively. In another sense, terminal values are the end-state we hope to achieve in life, whilst instrumental values are means of achieving these terminal values. A value is seen as an abstract structure that involves an associative network which can take different forms for individuals, and is hierarchically organized in terms of their importance for the self (Feather, 1999a). Feather (1990, 1992) distinguishes values from needs, as they have a normative or oughtness quality about them and involve a dimension of goodness and badness that needs do not require. Furthermore, whilst values are thought to be stable, needs are either momentary states of a person, similar to traits, or stable dispositional properties that are acquired (Atkinson & Feather, 1966; McLelland, 1985).

Values are relatively stable but not unchanging across the lifespan, and as such are modifiable by experience (Feather, 1990, 1994b; Rokeach, 1973, 1979; Schwartz, 1992). Values still function like needs to influence goal directed behaviour, and the strength of a person's values may affect how much effort a person puts into or persists at an activity, as well as the ways in which situations are construed (Feather, 1994a). Furthermore, values are also assumed to be

primed by the presence of situational cues, and once activated are thought to influence attitudes and beliefs (Feather, 1995). They influence the cognitive-affective appraisal of a situation so that some objects, activities, and outcomes are seen as attractive and others as aversive (Feather, 1995, 1999b). So, a person who values equality should see an equal prospect as attractive, whilst forms of discrimination that restrict equal opportunity as aversive.

Schwartz (1992) developed ideas about the structure and content of values, taking over from Rokeach's groundwork. Values are defined as criteria that people use, which vary in importance, are trans-situational, and serve as guiding principles in people's lives (Schwartz, 1992, 1996). The Schwartz Value Survey, a measure consisting of 56 values, is based on the analysis of motivational goals to make up a grouping of higher order values. This typology is categorised into four broad motivational goals, consisting of ten higher order value types: 1) Self Enhancement, which is made up of Power, Achievement, and Hedonism, 2) Openness to Change, which consists of Stimulation and Self-Direction, 3) Self-Transcendence, which are the values of Universalism, and Benevolence, and 4) Conservation, which is made up of Conformity, Tradition, and Security values.

Schwartz (1992) conceptualised a circular arrangement of values (see Figure 2.2), and as such a set of dynamic relations amongst the higher order value types that described a compatiblity or incompatibility if simultaneously pursued. For instance, values of universalism and benevolence (i.e., Self-Transcendence) are incompatbile with the simultaneous pursuit of achievement and power (i.e., Self-Enhancement). Similarly, values of conformity, tradition, and security (i.e., Conservation) are incompatible with the simultaneous pursuit of self-direction and stimulation (i.e., Openness to Change).

Empirical research into the personal values has also demonstrated its relationship with other general demographic variables such as education (Kohn & Schooler, 1983; Rokeach, 1973), age (Kohn & Schooler, 1983; Prince-Gibson & Schwartz, 1998; Schwartz, 1992), and religiosity (Roccas & Schwartz, 1997; Saroglou, Delpierre, & Dernelle, 2004; Schwartz, 1996; Schwartz & Huismans, 1995). Number of years of education consistently predicts a preference for self-direction versus conformity and tradition values (Kohn & Schooler, 1983), given that educational experience promotes "intellectual openness, flexibility, and

breadth of perspective essential for self-direction values" (Prince-Gibson & Schwartz, 1998, p. 56). Rokeach (1973) reported a continuous change in value priorities across age, where imaginative, intellectual, logical values increase towards college age and then slowly decrease, whilst values relating to family security, national security, and obedience decline to the ages around college and then slowly increase in importance. Finally, religiosity has consistently been found to have important relationships with personal values. In a meta-analysis on the relationship between values and religiosity, Saroglou et al. (2004) reported that religious persons tend to favour values that promote conservation of social and individual order (i.e., Tradition, Conformity, and Security) and conversely dislike values that promote Openness to Change and autonomy (i.e., Stimulation and Self-Direction).

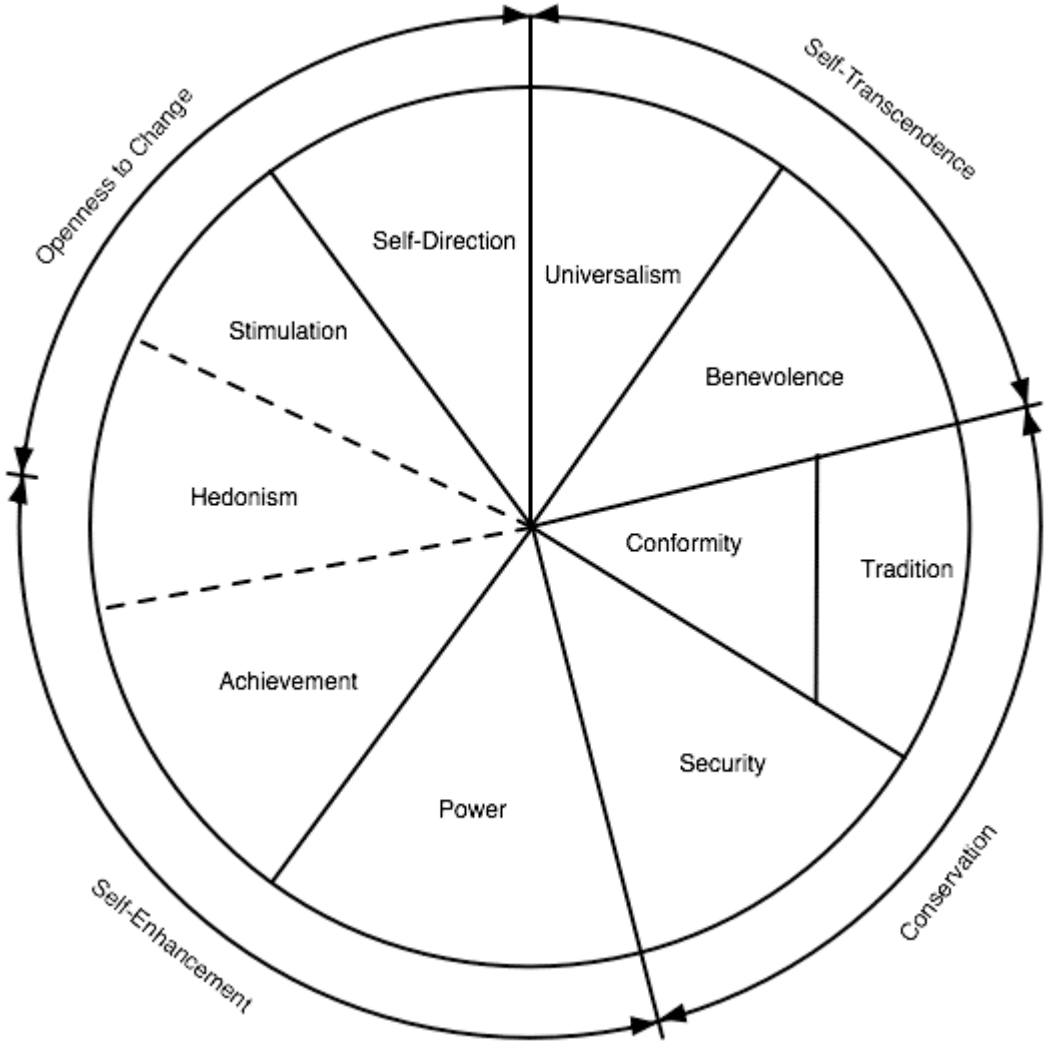

Figure 2.2. Prototypical structure of value systems (Schwartz, 1996).

2.3.2.1 Empirical Research examining Achievement, Power, Openness to Experience and Collectivist Values and Tall Poppies

As part of a series of studies, Feather (1989a) aimed to create and validate a scale to measure generalised attitudes towards tall poppies. More specifically, it aimed at understanding the relationship between attitudes towards tall poppies and global self-esteem, as well as testing the assumption that value preferences underlie tall poppy attitudes. Feather hypothesised that the desire to bring down a tall poppy would be related to individualistic values emphasising ambition and achievement, collectivist values emphasising equality and group harmony, and values concerned with social status and conformity to the status quo. So, those who respect achievement, social status, and conformity would be more likely to favour a tall poppy. In contrast, those who are more collectivist in their value preferences would be more likely to favour the fall of a tall poppy, and given the opportunity, might work to bring the tall poppy down. The results for the hypotheses relating to favour fall and favour reward, and their relationships with value preferences, were on the whole supported. Participants who favoured the fall of the tall poppy assigned more importance to tradition maintenance, hedonistic values, and less to achievement values when compared to participants who were less in favour of the fall of the tall poppy. It was also found that those who favoured the reward of tall poppies were significantly more likely to indicate a preference for achievement values, social power values, values concerned with stimulation, and values involving restrictive conformity, when compared with participants who were less in favour of rewarding the tall poppy. Furthermore, the statistically significant correlations for the total attitude score showed that participants who assigned less importance to achievement and social power were increasingly negative towards the tall poppy.

Overall the results supported the hypotheses, with the exception that collectivist values of a prosocial kind were not related to tall poppy attitudes. It was found that participants who favoured the fall of tall poppies assigned less importance to achievement values when compared to those who were less in favour of the fall of tall poppies. Achievement values comprised of being ambitious, influential, capable, intelligent, and successful. Furthermore, those

who were more in favour of rewarding the tall poppies assigned more importance to achievement and social power values when compared with participants who were less in favour of rewarding the tall poppies. Social power values was comprised of social power, wealth, social recognition, authority, and preserving my public image. It was also found that participants who favoured the fall of tall poppies saw tradition maintenance values as more important. Tradition maintenance values were comprised of respect for tradition, being humble, accepting my portion in life, and devout.

Additional studies by Feather (1989a) investigated the fall of high achievers who had a consistent status level, and looked at this relationship with values relating to equality. For example, the study depicted a student who had either consistently high or average grades in their school work. This research stressed the importance of the role of values as influential in the formation of attitudes. More specifically, Feather noted that particular values played a role in the mixed and ambivalent attitudes towards tall poppies before and after their fall. Feather argued that since most western cultures value competence, individualistic enterprise, and accomplishment (Feather, 1975, 1986; Hofstede, 1980; Rokeach, 1973; Schwartz, 1992), these values are influential in evaluating high achievers more positively when compared to the average achiever. By extension these high achievers can be regarded as "more competent, hard working, efficient, confident, and as deserving of more respect and admiration than the average performer" (Feather, 1989a, p. 240), in a culture where individualism and achievement are valued.

Feather (1989a) also reported that evaluation of a target can often rely on more than one dimension. Citing research by Lydon, Jamieson, and Zanna (1988), Feather noted that there are two important dimensions of similarity that inform impression formation. Attitude similarity (Byrne, 1971) may convey that the other person is worthy of respect and possesses intellectual traits, whilst preference similarity (Werner & Parmelee, 1979) relates to how much one likes and wants to engage in social interaction with the other person on a social dimension. It is possible for individuals to hold a negative stereotype of a high achiever and still have a positive evaluation of the tall poppy (Feather, 1989a). For example, they may hold high achievers in a positive light yet see them as unsociable, overly competitive, and arrogant. This is what Feather refers to as

the ambivalent attitude towards the high achiever that involves a mixture of negative and positive feelings. Similarly, there is recent research to suggest that persons can hold multiple attitudes toward a given object at once (see Wood, 2000, for a review). According to Wood an "attitude object can reflect diverse evaluations, cognitive representations and interpretations, and affective reactions " (p. 549).

2.3.2.2 Empirical Research examining Equalitarian Values and Tall Poppies

A study by Feather (1998) across three individualistic countries, Australia, Canada and the USA, examined the roles of values on attitudes towards tall poppies. Given the individualistic focus of these three nations, and previous research (Feather, 1989a) that demonstrated a link between values characterised in individualistic countries (e.g., achievement, social status), it was expected that participants would generally favour the reward of tall poppies rather than their fall. However, according to Triandis (1995) some countries (e.g., Sweden and Australia) are more horizontal (i.e., emphasise that people should be similar, especially in regard to status) than others (e.g., USA), which are conceptualised as vertical (i.e., emphasise inequality and differences in rank). Thus, Feather (1998) predicted that there should be differences amongst individualistic cultures based on these horizontal or vertical distinctions.

Feather's (1998) hypothesised that the American sample should be more likely to reward tall poppies, given their focus on success and achievement. In contrast, the Australian sample may be more likely to favour the fall of tall poppies due to the importance placed on equality and equal status in the culture. Feather did not predict any clear relationship for the Canadian sample. These predicted relationships are also supported by Schwartz's (1994) analysis of values at a culture-level that found that the United States differed from Australia by having a higher mean importance score on mastery, and a lower importance score on harmony (Feather, 1998).

Although there was a trend for American students to have higher favour reward scores when compared to Australian and Canadian students, this result was not statistically significant. Results for equalitarianism variables showed

that the Australian students were significantly higher on levels of state equality as well as levels of respect equality when compared with American students. Results for value composites across samples and gender generally supported the hypotheses. Female participants rated prosocial values, and affiliative values as more important when compared to males. The value composites also revealed significant differences across nations. The analyses revealed that:

> (a) the Australian students rated conformity values as less important for self, and prosocial values as more important when compared with the American and Canadian students; (b) the Canadian students rated conformity values as less important than did the American students and affiliative contentment values as less important when compared with the other two samples; and (c) the American students rated competence values and accomplishment values as more important when compared with the other two samples (Feather, 1998, p. 755)

The results from Feather's (1998) research into the attitudes towards high achievers and the roles of values demonstrated support for the various hypotheses. All three samples favoured the reward of tall poppies, however the sample of American students was in many ways different to both the Australian and Canadian sample even though all of these populations are considered to be individualistic in nature (e.g., Triandis, 1995). The American students who favoured the reward of a tall poppy more rated values concerning competence, accomplishment, and conformity as more important when compared to Australian and Canadian students (Feather, 1998). According to Feather this reinforces the view that American culture is somewhat distinctive in recognising and rewarding individual achievement and success.

Although the samples were not distinctive in wanting to see the tall poppies fall and thus did not support one of the hypotheses, Feather (1998) argued that the Australian sample was still unique on other dimensions. The Australian students rated conformity values as less important and prosocial values as more important when compared to the American and Canadian students. Furthermore, when compared to the American students the Australians were higher on state and respect equality. Feather (1998) interpreted this to support previous research (Feather, 1975) which found that "Australian culture

values achievement within a context of individualism but also shows collectivist concerns for equality, friendship and group solidarity" (p. 757). Coupled with this is a distrust of status seekers, and dislike of rank if it is not earned (Feather, 1998). So according to Feather (1998) attitudes towards figures of authority may involve a mixture of respect, distrust, and cynicism (Feather, 1993c), and individualism in Australian culture can be conceptualised as "following one's own path without necessarily conforming to the dictates of others" (Feather, 1998p. 757). Thus in many ways whilst other nations may also like to reward or see tall poppies fall, a variety of reasons still make the Australian Tall Poppy distinctive from other worldwide high achievers or persons of status.

There has also been additional work varied out by Feather (1989a) that suggests that importance of equalitarian values in the judgement of tall poppies. Two studies that looked at initial and subsequent attitudes towards a high achiever before and after a status fall provided support for this. A fall was where the high achiever fell from a high position to either an average or low position, or when an average achiever fell to a low position relative to the others. Initial feelings of negativity towards the stimulus person should be followed by feelings of pleasure when that person falls. In contrast where the stimulus person is initially viewed in a positive light, feelings of regret and disappointment should follow when a fall occurs. In addition to these predictions, it was hypothesised that participants would be more pleased about a high achiever's fall when compared to an average achiever's fall. Also, participants would be more pleased when the fall of the high achiever was to the average level in comparison to a fall to the bottom of the scale. Results from these studies (Feather, 1989a) showed a negative correlation between the initial attraction toward the stimulus person and the subsequent reported pleasure following their fall.

Perhaps not surprisingly, the stimulus person expressed more displeasure when the fall was from the top to bottom of the class. Whilst respondents did not express feeling any malicious joy about the fall of the stimulus person, they did express more displeasure when the fall occurred from the middle to the bottom of the class as compared to a fall from the top to the middle of the classroom. Feather (1989a) suggested that this indicated a preference for the average position in the classroom, related to equalitarian values. It was also argued that

the middle position reflects the norm and collectivity of the group that defined a degree of equality.

2.3.2.3 Empirical Research examining the role of Protestant Work Ethic, Communal Orientation Values and Tall Poppies

An unpublished study (Feather, 1993a), investigated tall poppy attitudes amongst different samples of students as well as their parents and children. Participants completed measures of Protestant ethic values, communal orientation, and equalitarianism as well as the Tall Poppy Scale, and the Schwartz Value Survey. Feather (1993a) hypothesised that those high on equalitarianism would favour the fall of tall poppies when compared to those lower on equalitarianism. Also, those lower on equalitarianism should favour the reward of tall poppies when compared to those higher on equalitarianism. It was also expected that those who supported Protestant ethic values would also favour the reward of tall poppies when compared to those lower on Protestant ethic values.

Participants in two of the samples completed the Protestant Ethic Scale (Mirels & Garrett, 1971), the Communal Orientation Scale (Clark, Oullette, Powell, & Milberg, 1987), and an Equalitarianism Scale developed by Feather (1993a). As reported by Feather (1993a), the Protestant Ethic Scale was developed to assess the moral outlook described by Weber (1904-1905/1971) in his classic analysis of modern capitalism that described a "moral outlook that stressed the virtues of hard work, self-discipline, the denial of pleasure for its own sake, and individual activism as a person attempted to fulfil his or her duty in a calling or vocation" (Feather, 1994a, p.50). Equalitarianism Scale (Feather, 1993b) comprised of six positive statements that concern equality of opportunity and equality of condition of state.

Results were generally consistent with the predictions made by Feather (1993a). Across both samples, there were significant positive correlations between favour fall and favour reward and the Protestant ethic values. Support was found in both samples for the hypothesis that favour fall of tall poppies would be positive correlated to equalitarianism. However, there was only support for the prediction that those lower on equalitarianism would favour the reward of tall poppies in the second sample. Feather also reported that the

Communal Orientation variable was generally unrelated to tall poppy attitudes except for a significant positive relation with Favour Reward in the second sample.

Feather (1993a) concluded that the results were generally supportive of the idea that "individuals who support the Protestant work ethic would also favour rewarding tall poppies and that those who hold equalitarian values would favour bringing tall poppies down to a level where status differences are reduced" (p. 51). However, there was the anomalous result where Protestant work ethic correlated positively with both favour reward and favour fall of tall poppies in both samples. This was explained by Feather as being influenced by the relationship between the Protestant Ethic scale and conformity values (e.g., being obedient). It was suggested that the reason the Protestant ethic values and favour fall of tall poppies were positively related was due to their joint dependence on other variables such as conformity values.

2.3.2.4 Empirical Research of Authoritarianism, Political Ideology Values and Tall Poppies

Feather (1993c) carried out additional research examining the role of authoritarianism and political ideologies on attitudes towards tall poppies. Whilst these variables are considered more in line with individual differences, their strong relationship with Values has led them to be presented in this section. In particular, Feather noted that authoritarians and people who share a right wing political preference share some common values. As such, the following section will look at the research into authoritarianism and attitudes toward high achievers after a small introduction to the concepts relating to authoritarianism.

Adorno, Frenkel-Brunswik, Levinson, and Sanford (1950) conceptualised authoritarianism as comprising of three major personality dispositions that were called conventionalism, authoritarian submission, and authoritarian aggression. Conventionalism can be thought of as the need to adhere to conventional middle-class values, and a tendency to feel anxious at the sight or thought of a transgression of these values (Sanford, 1973b). Authoritarian submission was thought of as an exaggerated, emotional need to submit to valid authority. Authoritarian aggression was assumed to be manifested in ethnocentrism and

prejudice, and involved the displacement of hostility onto out-groups (Feather, 1993c).

Altemeyer (1981) extended Adorno et al.'s (1950) work by conceiving right-wing authoritarianism as a personality variable involving authoritarian submission, authoritarian aggression, and conventionalism. Authoritarian submission was defined as a high level of submission to the perceived established and legitimate societal authorities. Authoritarian aggression was conceptualised as a general aggressiveness against deviants or outgroups believed to be sanctioned by the authorities. Authoritarian conventionalism was a high level of adherence to social conventions perceived to be sanctioned by society and its established norms.

According to Feather (1979b, 1984) there should be some common ground between authoritarianism and conservatism. According to previous research into political support and conservative values in Australia (Feather, 1985), participants who preferred the more right-wing Liberal party scored higher on a Conservatism Scale (Wilson & Patterson, 1968) when compared to those who favoured the left-wing Labor party. Furthermore, Liberal supporters also had value priorities that were more consistent with a conservative ideology (Feather, 1979b, 1984), and research into tall poppies has also substantiated this claim (Feather, 1989a). Feather (1993c) believed that authoritarians and right-wing voters would both be respectful of authority, conformity, and tradition, and place less emphasis on communal and egalitarian values (Feather, 1979b, 1984; Feather, 1989a). So, if authoritarians and right-wing voters share similar values, then they should view political leaders whose values and policies matched their own values more favourably.

Relationships between right-wing authoritarianism facets, as well as the related political ideology, proved to be relevant in the understanding of attitudes towards high achievers. Feather has (1989a) reported that Labor party supporters, who were higher on prosocial (e.g., a world at peace, equality), maturity (e.g., unity with nature, wisdom), and spiritual values (e.g., inner harmony, spiritual life) were more likely to favour the fall of the tall poppy when compared to Liberal party supporters, who were higher on achievement (e.g., ambitious, influential) and social power (e.g., wealth, social recognition) values. Liberal party supporters were also more likely to favour the reward of tall

poppies when compared to Labor party supporters. These relationships between attitudes towards tall poppies and political ideology have also been reported and replicated in another study (Feather, 1993d).

With respect to the relationship between right-wing authoritarian facets and attitudes towards tall poppies, Feather (1993c) provided insight into the role of authoritarian beliefs and attitudes towards high achievers. The reward of tall poppies was positively predicted by the Rule Following factor of right-wing authoritarianism. Conversely, favouring the fall of a tall poppy was positively predicted by Punitive Aggression and Conventionality, as well as negatively predicted by Rule Following. Feather (1993c) concluded it was the rule follower who was more likely to reward the tall poppy, whereas the more aggressive rebel was more likely to favour the fall of the high achiever.

2.3.2.5 Summary of the empirical research into Values and Tall Poppies

The studies that looked at the relationship between attitudes towards tall poppies and value priorities provided a detailed picture of the underlying drives involved in favouring the reward or favouring the fall of tall poppies. Feather (1989a) found that those higher tradition maintenance values, higher hedonism values, and lower achievement values supported the fall of a tall poppy. Also those with higher achievement values, social power, stimulation, and restrictive conformity were more likely to favour the reward of tall poppies. As such, values concerned with achievement (e.g., ambitious, influential, capable) and power (e.g., social power, wealth, social recognition) were positively related to the reward of tall poppies, whilst tradition maintenance values (e.g., respect for tradition, being humble, devout) were related to the favour fall of tall poppies. These results were complemented by Feather's (1998) research of individualistic countries, which found that Americans were more likely to favour the reward of tall poppies when compared to Australians and Canadians, perhaps due to higher levels of global self-esteem and higher levels on values of competence, accomplishment, and conformity.

There was also some support that persons with higher levels of equalitarianism would favour the fall of the tall poppy more when compared to those with lower levels of equalitarianism (Feather, 1993a). Those who reported

that there should be an equality of opportunity and equality of condition of state were more likely to support the fall of high achievers. Those lower in equalitarian values were also found to be more supportive of high achievers, however this result was found in only one of the two samples (Feather, 1993a). In another study (Feather, 1998) also found support for the relationship between equalitarianism and attitudes towards high achievers. It was reported that Australians had higher levels of both respect and state quality when compared to Americans. Recall that Americans are more likely to favour the reward of tall poppies when compared to Australians and Canadians. Thus, it appears that attitudes towards tall poppies are related to values concerned with the equal distribution of resources and the equal treatment, opportunity, and respect for human rights.

Finally, empirical research has demonstrated the links between political ideology, and authoritarianism with the favour fall and favour reward of tall poppies. Feather (1993d) showed that political ideology coloured the view of the tall poppy, such that persons were more likely to favour political figures whose identity was aligned with their own when compared to political figures in opposing political parties. Additional research (Feather, 1993c) showed the links between authoritarian beliefs and attitudes towards tall poppies. It was found that participants were more likely to reward tall poppies if they were rule followers, whereas those who supported punitive aggression and conventionality were more likely to favour the fall of tall poppies.

2.3.3 Attribution theory

A look at the causal attribution theory of motivation and emotion, with emphasis on the achievement literature, can shed light on the underpinnings for perceptions of tall poppies and their fall. The initial building blocks of attribution theory go back to the work of Heider (1958) and his ideas about the naïve psychologist or scientist. Heider believed that each person is generally curious about the world around them and intuitively construct causal theories of human behaviour, often trying to unravel the "why?" behind peoples' actions. In the same way, people may react to the success or fall of a high achiever in different ways depending on

what kind of attribution is made for their success. Very simply stated, an attribution is a judgement in trying to understand why things happen.

Feather (1992) contends that perceptions of high achievers are influenced by the interpretation of how responsible they are seen to be of their own successes or failures. For example, people may feel positive towards a tall poppy's achievement if it is seen to be due to hard work and effort, or high ability – actions that are valued by society. Conversely, for a person who has attained this status due to good luck or has failed to maintain it due to carelessness or lack of effort, it would be expected that they be viewed negatively. This analysis is further explicated by work on causal attributions in the field of achievement.

Weiner's (1985) comprehensive review of the literature in the field of causal attributions provides a good account of the evolution of attribution theory. From Rotter's (1966) individual differences account of individuals on a continuum from internal to external, that is those who have a tendency to attribute events to stable causes compared with those who attribute events to unstable causes, the structure of causality has moved beyond the sole predictor of locus. Research by Weiner et al. (1971) extended the understanding of causal attributions by classifying the causes thought to be most dominant in achievement related contexts (i.e., ability, effort, task difficulty, and luck) as either stable or unstable as well as internal or external to the person. Ability was classified as internal and stable, effort as internal and unstable, task difficulty as external and stable, and luck was thought of as external and unstable. Whilst this typology later proved to be inaccurate, as ability could be thought of as unstable if learning were possible, it did further an understanding of the structure of causal attribution. A subsequent third dimension, stability, was identified by Rosenbaum (1972) and later labelled controllability (Weiner, 1979). The classifications of these dimensions in achievement related contexts have led to the development of an attribution typology.

Task performance can be causally attributed to eight combinations with the proposed causal attribution theory (Weiner, 1979, 1985, 1986). The dimensions of locus (external or internal), stability (stable or unstable), and controllability (controllable or uncontrollable) can be considered when making an achievement attribution. Weiner (1986) integrated emotional states into an

attributional theory of motivation to understand how emotions are instigated following a positive or negative event, such as a success or failure. It was argued that locus was related to self-esteem and pride, such that self-worth should be enhanced when an A in an exam is ascribed to hard work or effort (internal) as compared to the teacher giving A's to everybody (external). Controllability was related to reactions of anger by observers; if personal failure was due to causes that were considered controllable by others, anger was elicited. On the other hand, uncontrollability could lead to emotions such as pity. For example, the student who failed an exam due to getting a sudden illness (uncontrollable) was shown compassion by others. Stability was thought of determining expectancies of future success and failure. Additional research by Weiner, Perry, and Magnusson (1988) into attributions related to stigmas found that controllability and stability differ amongst the perceived attributional characteristics of stigmas. Reactions of pity, liking, no anger, as well as help-giving behaviours are more likely to be associated when the stigma was seen to be outside of the person's control when compared to when the stigma was seen to be an outcome of the person's controllable behaviour. Thus, attributions for achievement can also be thought of in terms of three dimensions that are interrelated to specific discrete emotions.

According to Feather (1992) affective reactions relating to success and failure situations should incorporate underlying needs and values. Feather provided examples which relate the importance of values to affect and causal attributions. Achievement that is attributed to individual effort is more likely to be praised when compared to achievement that is attributed to external forces. Whilst hard work and effort is valued in western societies, this may not hold true for other societies where individualistic achievement is less valued (e.g., Feather & McKee, 1993). In addition, the affective reaction of guilt is dependent not only the causal inferences made by the individual, but is also interrelated to the infringement of morals that involve values that are central to the self-concept (Weiner, 1986). The final example provided by Feather regarding the importance of values in causal attributions is one relating to need satisfaction. Atkinson and Feather (1966) contended that those with stronger achievement needs feel more pleased about their successes when compared to those with lower achievement needs, and conversely more displeased when their

achievement needs are hindered. As such, the importance of understanding and accounting for values when considering the relationship between causal attributions (e.g., internal or external to the person) and affect (e.g., need for satisfaction) is an important one.

2.3.3.1 Empirical research examining Attribution theory and Tall Poppies

The seminal research by Feather (1989a) into the attitudes towards tall poppies looked in part at the role of attributions in the judgement of high achievers. The first of three studies investigated reasons why persons might evaluate tall poppies differently, focussing on the differences between high achievers and average achievers across attribution of performance, personality characteristics, and attraction. Participants completed one of six possible scenarios describing either a high achiever or an average achiever who fell from their position. The scenario described either John or Anne who suffered a fall from either high to middle, middle to low, or high to low. After having read the scenarios, participants then filled in four scales that related to possible causes of the stimulus' performance.

Results indicated that there were several key differences between high achievers and average achievers across attribution of performance, personality characteristics, and attraction (Feather, 1989a). Compared to the average achiever, the high achiever's performance was attributed more to ability, effort, and to friendly teachers as well as less to good luck. Furthermore, the high achiever was perceived to have more positive qualities, be more introverted, and have a greater achievement orientation in comparison to the average achiever. Participants did not differentiate between the average and high achiever on attraction. Taken into account, this suggested that whilst there were differences between the achievers there was no basis for saying that the high achiever was disliked (Feather, 1989a). Investigations into the causal attributions and other post fall items did not generally find any significant differences across the type of fall. The ideas reported and tested by Feather are important as they went on to shape the area of attribution theory, and the development of a theory of deservingness.

2.3.4 Balance theory and Deservingness

The work by Heider (1946, 1958) in the area of cognitive consistency and interpersonal relations provides a good theoretical standpoint from which to view attitudes towards tall poppies. This motivational theory of attitude change suggests that a Person (P) strives towards psychological balance on an attitude, object or topic (X) with another person (O). This triad is said to be consistent if it is balanced, and balance can be assessed by counting the number and types of relationships among the elements. There are eight possible combinations of relationships between two people and an attitude object, where four are balanced and the other four are unbalanced. A balanced relationship occurs when the multiplication of the valence attitudes for P, O, and X is positive, and conversely an unbalanced relationship happens when the multiplication of the valence attitudes is negative. For example, P liking X is a positive (+) relationship, O liking X is positive (+) and P disliking O is negative (-). This would result in an unbalanced triad. The relevance of balance theory to the present research is the application by Feather (1992) in the area of deservingness.

Feather (1992) reviewed and extended some aspects of balance theory and attribution theory in order to develop the concept of deservingness. According to Feather, a judgement of deservingness consists partly of the perception that the person has "caused the event and is accountable for the outcome and its consequences" (p. 127). The assumption is that a person is seen to be deserving of an outcome when they are perceived to be personally responsible for it. The previous section on attribution theory highlighted the role of assigning responsibility to events that stemmed from intention and internal controllable causes (Weiner, et al., 1988). As such, outcomes and consequences are seen to be undeserved when the person is not seen to be responsible for them; in terms of attribution theory, the actions are uncontrollable (control) and internal or external to the person (locus). So for example a tall poppy that has achieved a position because of being born into a wealthy family (i.e., luck that is considered uncontrollable and external) may be seen not to deserve their position when compared to someone who has attained that status through hard work and effort (i.e., controllable and internal).

The distinguishing characteristics that set Feather's (1992, 1994a, 1999a) theory of Deservingness apart from previous work on attribution theory (Weiner, 1985) are its relation to valued behaviours and valued outcomes. According to Feather (1990) general needs and values influence the way in which a person construes subjective values of particular actions and outcomes. As such, the conjunction of either a positively or negatively valued behaviour with either a positively or negatively valued outcome is seen to determine the judgement of deservingness. Using graph theory (Cartwright & Harary, 1956; Harary, Norman, & Cartwright, 1965) it is possible to depict the relationships between elements and structures in the deservingness model.

Relationships between objects and ideas, such as Heider's (1946, 1958) theory of motivational change that conceptualises the consistency motive as a drive toward psychological balance, can be represented using graph theory and signed digraphs. A digraph is a directional graph that allows for the pictorial representation of the direction of a sentiment or attitudinal relation (Cartwright & Harary, 1956). A positive sentiment or attitudinal relation is represented by a solid line, and a dashed line represents a negative sentiment or attitudinal relation. An arrow on a line indicates the direction of the attitudinal relation or sentiment. Finally, a positive unit relation is represented by a solid bracket, whilst a dashed bracket represents a negative unit relation. Each combination of elements is referred to as a semicycle, and balance can be assessed by counting the number and types of relationships among the elements and the outcome is indicated by a sign – in this case, positive or negative. Figure 2.3 illustrates the basic relations between a person's action and outcome.

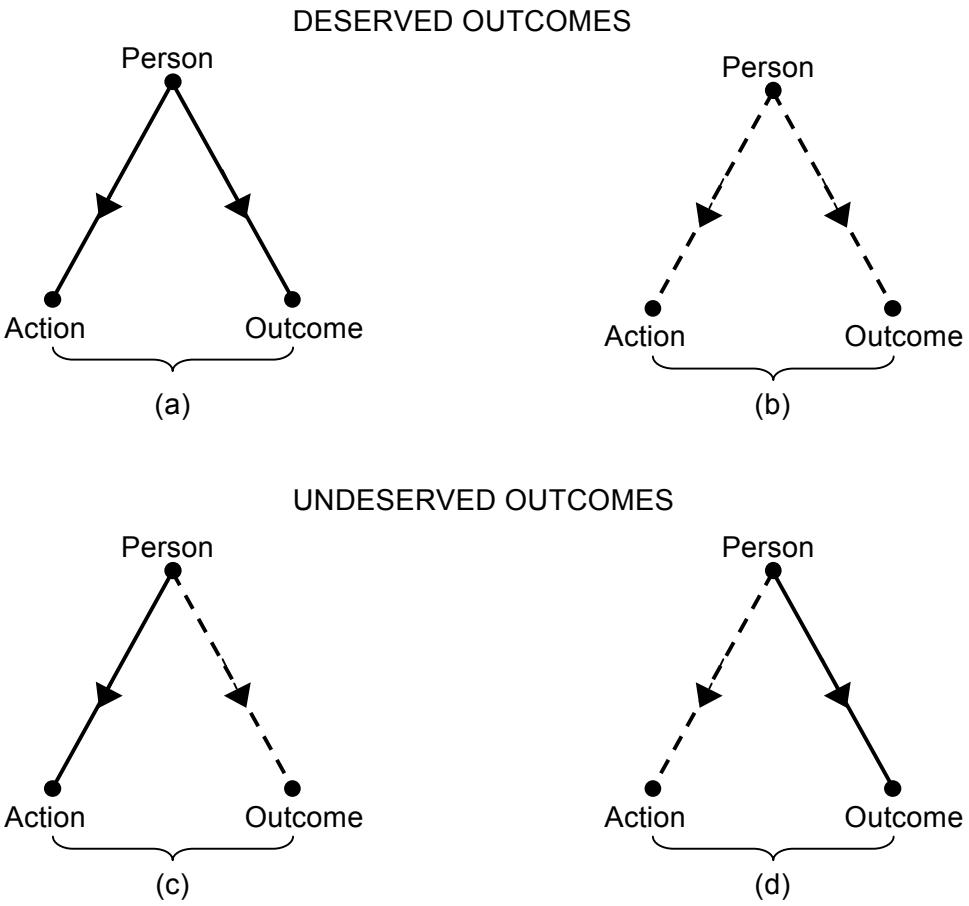

Figure 2.3. Balanced and unbalanced structures representing deserved outcomes and undeserved outcomes (Feather, 1992).

As seen in Figure 2.3, the action is bound to the outcome and as such is represented by a solid bracket. Figure 2.3(a) and Figure 2.3(b) represent two situations where the judgement of a deserved outcome would be made. For example, a positively valued behaviour (i.e., hard work or effort) that leads to a positively valued outcome (i.e., success at an exam) is seen to be deserved. In the same way, a negatively valued behaviour (i.e., cheating) that leads to a negatively valued outcome (i.e., failure at an exam) is also seen to be deserved. Undeserved outcomes arise where there is an imbalance in the semicycle, represented in Figure 2.3(c) and Figure 2.3(d). For example, a positively valued behaviour (i.e., hard work or effort) that leads to a negatively valued outcome (i.e., failure at an exam) is seen to be undeserved. Likewise, a negatively valued behaviour (i.e., cheating) that leads to a positively valued outcome (i.e., success at an exam) is also seen to be undeserved.

The important addition of this analysis of deservingness is that it unravels values and controllability (Feather, 1992). Under the attributional analysis of

Weiner et al. (1988), uncontrollable behaviour was seen as tied in with less responsibility and as such deemed to be undeserved. However, there may also be outcomes that follow controllable behaviour that are seen to be undeserved. The previous examples where a positively valued behaviour led to a negatively valued outcome, or a negatively valued behaviour led to a positively valued outcome are examples of such instances. Additions to this model of deservingness have been made (Feather, 1994a, 1996) to extend the structure to include the situations where an actor is being observed by another person. These extensions enable predictions to be made about the effects of social identity and interpersonal relationships, and move beyond the idea that deservingness requires the structure to be balanced as in Heider's (1946, 1958) sense.

2.3.4.1 Empirical research examining Deservingness in success and failure situations and Tall Poppies

A study reported by Feather (1989a) involved both an average and high achiever whom suffered a fall. Whilst the fall in the first study was due to a failure at an examination, the fall in the second study was because of a misdemeanour. Feather argued that if the high achiever's success was perceived as attributed to cheating in the past, then the privileges and benefits presently enjoyed by them would be seen as undeserved. In addition, in comparison to the average achiever the sanctions given to the high achiever should be greater given the present status to which they are afforded. According to Feather this could be due to the high achiever having transgressed a normative expectation about appropriate behaviour or moral standards.

The post fall items indicated that participants favoured more punitive actions for the high achiever when compared to the average achiever. Participants reported that they were more likely to report the high achiever to authorities, recommend a harsher penalty for the high achiever, that they thought the high achiever was more deserving of the penalty, and would feel more pleased about their expulsion from the institution when compared to the average achiever. They also reported feeling significantly more pleased when the high achiever was caught cheating compared to the average achiever. Again, similar to the first study into attitudes towards tall poppies (Feather, 1989a), a negative

correlation between initial attraction to the stimulus person and feelings surrounding their fall was found.

The combined results of study 1 and 2 from Feather's (1989a) seminal study into perceptions of tall poppies demonstrated the links between variables where a fall from status had occurred. Feather interpreted these results to suggest that the perception of a high achiever can change depending on how they have obtained their status. Given that the second study provided information about the cause for the fall, participants felt that high achievers deserved to be punished more than the average achievers; whereas, no differences were found in the first study due to a lack pretext for the fall. Feather explained this as being due to participants viewing the transgression by the high achiever as being more serious, perhaps due to an expectation that the high achiever should be more responsible and had not acted in an exemplary fashion. Furthermore, if high achievers were thought to have obtained their status through ill means (e.g., cheating) participants were likely to change their perception of them. Again, Feather noted that the pleasure reported from lopping the tall poppy could have been due to the levelling that demonstrated them as fallible and more like the rest of the group.

Further research on deservingness examined the role of attributions and values in the perception of both average and high achievers (Feather, 1992). The information about how the stimulus person had obtained their position was varied in one of three ways: no information was provided; the stimulus person was described as not having a lot of natural ability but worked hard (average ability/ high effort); and, the stimulus person was described as having a lot of natural ability but with little work ethic (high ability/ low effort). Participants then rated the average or high achiever on how they privately felt about the stimulus person's final score, how deserving they were of that score, how responsible the stimulus person was for that score, how much praise the stimulus person should get, and how they thought the stimulus person would feel about obtaining their final score.

Results for the first Feather (1992) study showed differentiations between the ratings based on attribution of events, as well as towards high and average achievers. It was found that when performance was attributed to effort (controllable), the stimulus person was rated as significantly more responsible for

the successful outcome when compared to the performance that was attributed to natural ability (uncontrollable). The stimulus person with high effort/average ability was also seen to be more deserving, given more praise, and more positive affect when compared with the low effort/high ability conditions. Thus, when a positively valued action (high effort) was followed by a positively outcome (success) these ratings of deservingness, positive affect, and praise were higher. The corresponding ratings were lower in the low effort/high ability conditions, where a negatively valued action (low effort) was followed by a positively outcome (success). Ratings for pleased, envy, praise, and the stimulus person's pleasure were significantly higher for the high achiever when compared to the average achiever.

The second study by Feather (1992) also had three different variations of the causality about the low score obtained after the final exam: no information was provided about the fall; the stimulus person was described as having contracted a serious illness before the examination that had affected their performance (uncontrollable/ unintentional); and, the stimulus person was described as having slacked off and not putting in extra effort before the exam (controllable/intentional). Participants then rated the stimulus person on deservingness and responsibility for the outcome, similar to study 1. In addition, they also rated how sorry they privately felt for the stimulus person due to the low score they obtained, how unhappy they felt about the stimulus person obtaining the low score, how pleased they thought the stimulus person would be with the low score, and whether they would allow the stimulus person to re-sit the exam with the opportunity of improving their score.

These results (Feather, 1992) highlighted some fascinating differences between the attributions for the fall of the high or average achiever. When the cause of the fall was attributed to sickness (uncontrollable), as compared to reduced effort (controllable) or when no cause was provided, the stimulus person was seen to be less responsible for the low grade, less deserving of the low grade, and less pleased about the low grade when compared to the targets. In this case, when a negatively valued outcome (low grade) followed a negatively valued action (low effort) there was less sympathy and enthusiasm to allow the stimulus person to re-sit the exam. When the failure occurred due to sickness, the stimulus person was seen to be less responsible for this situation and was more

likely to attract sympathy and willingness to re-sit the exam when compared to the reduced effort or no information conditions. The average achiever was also viewed to deserve the lower grade more than the high achiever, and there was more sympathy for the high achiever when they obtained the low exam score.

Feather (1992) interpreted the results from these studies as support for his model of deservingness. The impact of status on the perception of the achiever was seen to be less simplistic that in previous studies (i.e., Feather, 1989a). With minor exceptions there was no evidence that participants were happier about the fall of the high achiever when they fell compared to the average achiever. Furthermore, it was seen that with the addition of the deservingness and value framework that the evaluation of a tall poppy became somewhat more complex. In line with previous attribution research (Weiner, et al., 1988), Feather also found that attributions based on responsibility for events impacted on the attitude ratings given to the average and high achievers. Recall that in the seminal research by Feather (1989a) participants attributed the success of high achievers to sources described by Weiner (1985) as controllable. It was found that in comparison to average achievers, high achievers' performance was attributed more to effort and ability and less to good luck. Whilst these items did not explicitly relate to the post fall items, the related theoretical construct of deservingness provided further information into the reasons why someone might favour or disapprove of a tall poppy.

After information was provided about how the stimulus person obtained their position, Feather (1992) found that the ratings were more positive for the target when their performance was attributable to controllable events as opposed to those attributed to uncontrollable events. This person was seen to be more deserving, given more praise, and more positive affect when compared to the person whose performance was attributed to uncontrollable events. This was interpreted as support for a deservingness model, whereby a positively valued action (e.g., hard work) that leads to a positively valued outcome (e.g., success) is seen as deserved. Further support was added with Feather's (1992) second study whereby a failure had occurred due to a controllable (reduced effort) or uncontrollable (sickness) action. Again, the image of the tall poppy was painted more negatively when they are not seen to deserve their status as compared to one that is seen deserving of their status.

2.3.4.2 Empirical research examining Deservingness, Personality, and Affect for public Tall Poppies

The study by Feather, Volkmer, and McKee (1991) examined the attitudes towards highly visible public figures in three domains: sports, politics, and entertainment. The aim of this research was to extend previous research (Feather, 1989a; Feather, 1989b) by examining causal attributions, beliefs about deservingness, personality characteristics of high achievers, and affective reactions to the high achiever's success and hypothetical fall from their position. The assumptions of this study were much the same as those in Feather's (1992) research on deservingness in success and failure situations, and revolved around the role of values and attributions developed from Weiner and colleagues (Weiner, 1986; Weiner, et al., 1988) that have been discussed earlier.

Feather et al. (1991) hypothesised that participants would feel more pleased about a high achiever's success and see the high achiever as more deserving of the success when this success could be attributed to internal causes that involved controllable effort and ability as opposed to external causes such as opportunity or luck. Furthermore, it was also hypothesised that participants would feel less pleased, sorrier, and more disturbed about a high achiever's fall if the tall poppy was seen to be responsible for and deserving of the position held prior to the failure. In addition, the Tall Poppy Scale (Feather, 1989a) was to be validated against measures of deservingness, feelings of pleasure about the tall poppy's high position and after their fall.

Additional hypotheses regarding how the tall poppy's position and personality characteristics were also investigated. This was a follow up to Feather's (1989a) previous research that found subjects were more pleased about a fall when their initial evaluations of the tall poppy's personality characteristics were less than favourable. As such, it was predicted that participants who evaluated a public figure more positively in terms of their personality characteristics would also be more likely to report that the success was deserved and report feeling more sorry if the tall poppy were to suffer a failure, when compared to those who viewed a tall poppy less favourably or negatively.

The participants, high school students, completed a questionnaire that presented three well-known Australian high-achievers who came from the field

of sports, politics, and entertainment. The high profile sportspersons were Pat Cash (tennis), Alan Border (cricket), and Lisa Curry-Kenny (swimming). Those from politics were Robert Hawke (Labor Party), Andrew Peacock (Liberal Party), and Janine Haines (Democrat Party). The public figures from the domain of Australian entertainment were Kylie Minogue (actress and singer), Paul Hogan (actor), and John Farnham (singer).

Results supported the hypothesis that tall poppies that were perceived to have achieved their success by ability and effort were seen to deserve their success more, and participants also reported feeling more pleased about the achievement, and less about a fall when the success was due to internal and controllable causes. Also as predicted, when the achievement was attributed to opportunity or good luck, the results were in the opposite direction. Support was also found for the hypothesis regarding affect and its relationship to deservingness and attribution for success. Participants who reported feeling more sorry, less pleased, and more disturbed about the hypothetical fall were also more likely to attribute the tall poppies' present position to ability and effort, less to outside assistance, and more likely to report that the tall poppies deserved their present position. Support was also found for the hypothesis that positive ratings of personality characteristics would also yield higher judgements of deservingness and positive affect. When tall poppies were seen to deserve their position more, and participants reported feeling more pleased about their success and less pleased about a hypothetical fall, it was also found that these tall poppies were high on the good mixer scale for the personality characteristics. On the other hand, when tall poppies were seen to be self-centred they were seen to be less deserving of their success, and participants rated feeling less pleased about their current high position and more pleased about their hypothetical fall.

Interestingly, it was found that evaluations of public figures were related to the domain in which they were eminent. Participants rated figures from the sports domain more favourably when compared to those from the entertainment and political areas. In general they rated sportspersons as having achieved success due to ability and effort and less to ability or luck when compared to politicians or sportspersons. Also, sportspersons and some others in the entertainment and political arena were seen to deserve their position more when compared to the others. However, this is not a surprise given that deservingness

ratings for the present position were highly correlated with attributions for success of ability (r = .61) and effort (r = .64).

The results also provided support for the validity of the devised Tall Poppy Scale (1989a) given its relationships with the other measured variables. Scores on the two subscales of the scale, favour fall and favour reward of tall poppies, correlated with the expected variables in the predicted directions. So, participants who were more in favour of the fall of tall poppies and had higher total negative attitude scores were more likely to report feeling more pleased if a tall poppy were to fall, less likely to report that they deserved their high position, less likely to attribute their success to internal causes, less likely to report feeling pleased about the tall poppy's high position, and less to report feeling sorry when the tall poppy fell. These relations were in the opposite direction for the favour reward variable.

This study by Feather et al. (1991) was important in the research program into attitudes towards tall poppies as it was able to use real life examples to test and validate the associated theoretical framework. The research investigated tall poppies across three distinct domains and found that attitudes towards these high achievers were not only influenced by perceptions of deservingness and the evaluation of personality characteristics, but also by something else related to the domain from which they heralded. This finding was explained by attributions for success; that those perceived to have achieved their position due to internal causes such as hard work and effort were more likely to be favoured, and this is why sportspersons were seen more favourably when compared to some politicians and entertainers. It could also be that internally attributed causes such as hard work and effort could be more salient with sportspersons when compared with the other groups. Furthermore, the personality characteristics ascribed to the high achievers were also related to the perceptions of the tall poppies.

The two factors of personality characteristics determined by Feather et al. (1991) provided additional information about the perception of high achievers. When participants were approving of tall poppies, they were also more likely to rate them higher on friendliness, integrity, and other good mixer variables. Feather et al. noted that it was when tall poppies were seen to be egotistical and self-interested, that they were more prone to be felled from their high position. Coupled with attributions for success, personality characteristics were found to

be a good predictor of whether or not a tall poppy was seen to deserve to maintain their position. So, the quiet achievers who were perceived to have attained their position through hard work and effort were more immune to attack than those who were seen to be self-centred, quick-tempered, uncaring in their attitudes, and whose integrity and concern for others was suspect (Feather, et al., 1991). This was further support for the view that rather than there being a general negative view of high achievers in Australian culture, perceptions of tall poppies are dependent on things such as attribution for success, personality characteristics, perceived deservingness, as well as the possibility of domain specific factors.

A subsequent study by Feather (1993d) sought to replicate and extend on the previous Feather et al. (1991) research by examining the role of attributions, deservingness, personality, and affect in the perception of political leaders. The study took advantage of some striking political events that happened in 1991 when the Prime Minister and leader of the Labor political party Robert Hawke resigned, and Paul Keating took over as leader. So, at the time there was a unique situation where a tall poppy, Hawke, suffered a sudden fall and Keating acquired the position. The study also looked at the perception of the opposition leader at the time, John Hewson.

Again, many theoretical ideas were drawn upon to inform what influences the perception of the rise and fall of political leaders. Feather (1993d) framed the hypotheses around the model of deservingness, causal attributions, perceived responsibility, personality characteristics, and reported affect. In line with previous research on deservingness and attitudes towards tall poppies (Feather, 1992; Feather et al., 1991), Feather (1993d) hypothesised that participants would feel more pleased about the success of Keating and Hewson. It was expected that participants would judge them as more deserving of success when their success could be attributed to internal causes involving ability and effort as compared to external causes such as assistance and good luck. Conversely, Feather (1993d) hypothesised that participants would feel less pleased about the success of Keating and Hewson and see them as less deserving of success because they should be perceived to be less responsible about their positions, as their success could be attributed to external causes such as assistance and good luck as compared to internal causes involving ability and

effort. Similar hypotheses were also generated about the relationships between deserved actions and outcomes for Hawke.

Specific hypotheses relating to political allegiance were also devised. It was expected that Liberal voters would view Hewson as having achieved his position more through internal causes and less by external causes when compared with Labor and Democrat voters. Liberal voters would also be more likely to judge Hewson as deserving of his current position and deserved to maintain it, report feeling pleased about his success and less pleased about his fall, and rate his personality characteristics more positively when compared to Labor or Democrat voters. Feather also predicted identical political allegiance based hypotheses for Hawke and Keating when compared to Democrat or Liberal voters. The results showed that participants' responses were related to their own political preference and the political identity that was being judged. Labor voters judged Keating to have attained his position through hard work and effort, and less by external assistance and luck when compared with Liberal voters. On the other hand, participants who supported Labor judged Hewson to have attained his position more by external assistance and good luck when compared to Liberal voters. When compared with Liberal voters, participants who supported the Labor party saw Keating as deserving to hold and maintain his high position more, were more pleased about him holding that high position, would be more pleased if he were to rise further, would be less pleased if he were to fall, rated Keating as higher on integrity and less on arrogance, saw him as less responsible should he suffer a hypothetical fall, and reported feeling more sorry, less pleased, and more disturbed should Keating fall from his present high position. In contrast, all of these differences were in the opposite direction for Hewson when comparing Liberal versus Labor supporters.

Also, the reactions to Hawke's actual loss of the Prime Ministership were strongly related to voting preference. When compared with Liberal votes, Labor voters were less likely to attribute Hawke's fall as due to ability or talent, saw him deserving his fall less, were less pleased that he lost his position, would be more pleased if he became Prime Minister again, would be less pleased if he were to fall further, saw Hawke as having more integrity and less arrogance, judged him to be less responsible for his fall, and reported feeling more sorry, less pleased, and more disturbed about his fall. These results were similar to that

reported by Feather et al. (1991) as the correlations involving deservingness, causal attribution, perceived responsibility, personality characteristics, and reported affect were all in line with the previous research. Other results demonstrated that the more Hawke was seen responsible for his fall and lacking in integrity, the more he was perceived to deserve his fall. These relations were in the opposite direction when Hawke's fall was attributed to external forces or bad luck and were independent of voting allegiance.

This study by Feather (1993d) into the rise and fall of political leaders added further support for the model of deservingness. It also provided strong ecological validity with the use of a recent tumultuous event in Australian politics. Again, as in the research carried out by Feather et al. (1991), there was more support for the relationship between deservingness, causal attributions, perceived responsibility, personality characteristics, and reported affect. More importantly, these relationships were shown to exist irrespective of voting allegiance, and as such demonstrate the importance of attributions for success, perceived responsibility for an outcome, and perceived personality characteristics in the prediction of deservingness. Furthermore, Feather (1993d) concluded that the judgements of deservingness relate both to the personal responsibility of the actor, and whether or not positively valued success or negatively valued failure follows from behaviours that were positively or negatively valued.

2.3.5 Individual differences and Tall Poppy research

According to Feather (1994a) attitudes towards tall poppies should reflect the amount of failure and frustration that individuals have encountered in their lives, as well as envy and other negative feelings they experience. Further to this, disappointment and anger, along with feelings of envy towards those who are successful would follow a failure to achieve goals that are important to the individual (Feather, 1989a). Feelings of pleasure derived from a tall poppy's fall may then be linked to an individual's frustrated ambitions and to the anger and envy that may occur.

> If one assumes that consistent failure to achieve important goals determines lower global self-esteem and lower perceived competence, then it would also be expected that individuals with low self-esteem and

> low perceived competence would be more envious of a tall poppy and happier to see a tall poppy than would individuals with high self-esteem and higher perceived competence (Feather, 1989a, p. 258).

Individuals with high self-esteem and high perceived level of competence may be more likely to identify with the tall poppy because the tall poppy is seen as closer to the self in relation to achievement status (Feather, 1994a).

Drawing on the similarity/attraction hypothesis (Byrne, 1971), Social Identity and Social Categorisation theories (e.g., Tajfel & Turner, 1985; Turner, 1987), as well as Social Comparison Theory (e.g., Salovey & Rodin, 1984; Salovey, Suls, & Wills, 1991; Tesser, 1986; Tesser, Suls, & Wills, 1991) Feather (1991a) presented the expected links between global self esteem and perceived level of competence with attitudes towards tall poppies. Firstly in line with the similarity/attraction hypothesis, participants with higher levels of global self-esteem and perceived competence should see tall poppies as more similar to themselves when compared to those with lower levels of global self-esteem and perceived competence and as such be more attracted to them. Secondly according to Social Identity theory and Self Categorisation theory, persons high in global self-esteem and with high perceived competent people should categorise themselves more as belonging to the tall poppy group and therefore display respect and admiration for the high achievers and want to see them rewarded for their achievements. Conversely, those with low levels of global self-esteem and lower levels of perceived competence should not view themselves as part of the same group of tall poppies, and thus display envy because the high achievers belong to a different group.

2.3.5.1 Empirical research examining Global Self-Esteem, Gender, Perfectionism and Perceived Level of Competence

A series of studies provided general support for the relationship between global self-esteem and attitudes towards tall poppies. Results demonstrated that persons low in global self-esteem favoured the fall of tall poppies more when compared to those high in global self-esteem (Feather, 1989a; Feather, 1993b, 1993c; Feather & McKee, 1993). Furthermore, with the exception of one study (Feather, 1989a), it was also found that participants higher in global self-esteem

were more likely to reward a tall poppy when compared to persons lower in global self-esteem (Feather, 1993b, 1993c; Feather & McKee, 1993). With the exception of a cross cultural study (Feather & McKee, 1993) that did not find the same pattern of results for a Japanese sample, largely due to a different construal of self-esteem, the results relating global self-esteem and attitudes towards tall poppies are consistent. For example, those lower in global self-esteem are less likely to identify with high achievers and thus support the fall of these high achievers to reduce the status difference between them. On the other hand, persons high in global self-esteem should identify more with high achievers and thus favour their reward.

Global self-esteem and gender differences were examined in a study that looked at attitudes towards tall poppies across Australia, Canada, and America (Feather, 1998). It was hypothesised that higher levels of global self-esteem would be reported by the American sample when compared to either the Australian or Canadian samples, assuming that "global self-esteem in individualistic countries partly reflects an emphasis on values concerned with individual success, competence, and mastery" (Feather, 1998, p. 750). An hypothesis was also made about gender differences for prosocial, relational, and communal values where it was expected that females would assign more importance to these values when compared to males. General attitudes towards the tall poppy and global self-esteem levels across nations were generally in line with predictions. Across all nations, females consistently had lower global self-esteem scores, lower favour fall scores, and higher favour reward scores when compared with males. Results also showed that American students had significantly higher global self-esteem scores when compared with Australian and Canadian students.

Additional research stemming from the work of Feather was carried out investigating the effect of perfectionism on the perception of tall poppies. Paccagnella and Grove (2001) examined the effect of perfectionism on attitudes towards tall poppies in the sports domain. It was assumed that those who set high standards for themselves may closely identify with other high achievers, and should not denigrate them. Results showed that High Personal Standards (i.e., meeting excessively high self-exceptions placed upon oneself) was significantly negatively correlated with Total Negative Attitude and Favour Fall of the Tall

Poppy Scale, and significantly positively correlated with Favour Reward. No correlation was found between Concern Over Mistakes (i.e, being critical of mistakes in performance) dimension and any other variable, except for a positive correlation with High Personal Standards. Paccagnella and Grove (2001) concluded that perfectionism did play a mediating role in attitudes towards tall poppies whom are in the sports domain. That is, individuals who set high personal standards closely identify with high achievers, and do not want to denigrate them. The results were interpreted as support for previous research by Feather into the relationship between self-esteem, deservingness, and attitudes towards tall poppies (Feather, 1989a; Feather, 1993d; Feather & McKee, 1993; Feather, et al., 1991).

Finally, some research into the fall of Ben Johnson (the winner of the 100 meter sprint at the 1988 Seoul Olympics who was disqualified for drug use) from grace (Feather, 1991a) showed that social comparison processes could influence perceptions of tall poppies. Arguing that global self-esteem is positively related to school performance for students later in high school (Feather, 1991b), Feather (1991a) found that competence at school is an important determinant of global self-esteem. Those higher in perceived level of competence categorised themselves more as like the tall poppy group and therefore displayed admiration and respect, wanting to see them rewarded (Feather, 1991a). This suggested that social comparison processes can influence the evaluation of tall poppies.

2.3.6 The role of culture and context in attitudes towards Tall Poppies

The work of Feather and colleagues presented thus far has looked at individual differences as predictors of attitudes towards tall poppies. However, this also depends on the nature of the tall poppy. That is, the following sections will examine how different formats relating to how they have achieved their position influences attitudes towards them. For example, Feather and colleagues investigated the Tall Poppy Syndrome in a series of cross cultural studies that looked at Japan, Canada, and America, in addition to Australian samples. Furthermore, there are only a few studies which have examined the effect of the context or domain on the perception of the tall poppy. The following section will present the tall poppy research relating to culture and context, and importantly

highlight the interesting and relevant findings that warrant more attention in the present thesis.

2.3.6.1 Empirical cross cultural research into attitudes towards Tall Poppies

The research into attitudes towards high achievers, or tall poppies, has also been extended beyond the shores of Australia by Feather and colleagues. Several published studies have investigated the relationships between the generalised attitude towards high achievers and variables like global self-esteem and value priorities in Asian and North American samples. According to Feather (1994a), one would expect to see differences in tall poppy attitudes across cultures due to different value priorities. Feather argues that in other countries such as Japan there may be a stronger tendency to want to see tall poppies fall when compared to Australia, given that tall poppies oppose the normative expectation that achievement should occur within the bounds of independence, group harmony, and humility rather than personal ambition.

Feather and McKee (1992) were interested in investigating if there were differences between an Australian and Japanese sample in how self-esteem and construal of the self related to the perception of tall poppies. Informed by Markus and Kitayama's (1991) ideas about independence and interdependence and how the self is construed, Feather and McKee assumed that the Japanese culture was more likely to emphasise interdependence with the social context whilst the Australian culture more individualistic. Furthermore, Australia is considered to be a place that rewards individual achievement and personal advancement (e.g., Feather, 1975, 1986). So, in addition to other hypotheses relating to likeability and envy, it was hypothesised that Japanese students would perceive the high achiever more negatively when compared with the Australian students given that Japanese culture should be less positive towards individual achievement when compared to Australian culture.

Participants answered a questionnaire in their language that involved a hypothetical scenario involving a stimulus person. The scenario described a golfer or student who was either a high achiever or an average achiever. The seven items assessed attraction or liking for the stimulus, how pleased they were of the stimulus' performance, and how envious they were of the stimulus person.

Participants then read another scenario that was matched for context, which described the stimulus person 10 years after the initial scenario as having either maintained their performance or failing to maintain their performance. Following this scenario, participants once again answered the semantic differential items and the attitude measures.

Results did not support predictions about a tall poppy effect, with no evidence that participants reported more positive feelings about the fall of a high achiever when compared to that of an average achiever. The high achiever was also seen to be more assertive than the average achiever, and was also initially envied more. Additionally, there were a host of complex main and interaction effects for nation, subsequent performance, and scenario. Australian students were more pleased about the performance of the stimulus person compared to the Japanese students, all students were more pleased about the high achiever when compared to the average achiever, and all students were more pleased about the initial performance when compared to the subsequent performance. However, these were qualified by interaction effects such that whilst subjects were more pleased about the high achiever when compared to the average achiever in the initial scenario, there was little difference between the level of the achiever in the subsequent scenario where the stimulus person either maintained their position or suffered a fall. Also, whilst participants were less pleased about the performance when the stimulus person suffered a fall, there was a small increase in how pleased they were of the stimulus' performance when they maintained their original position. Furthermore, participants were more envious of the high achiever when compared to the average achiever for the first scenario, and it was much greater in the student domain when compared to the golfer. In addition, the results also showed that Japanese students especially favoured the golfer when compared to the Australian students.

Whilst there were no cultural differences relating which indicated a tall poppy effect (i.e., participants being more pleased about the fall of a high achiever when compared to an average achiever), the study did demonstrate some interesting information with respect to the fall of a tall poppy. Of particular note is the effect of domain (i.e., golfer vs. student) on reported levels of envy. Whilst it was found that participants envied the student more so when compared to the golfer, this effect did not translate into other areas such as

pleasure for the stimulus' performance or likeability for them. Feather and McKee (1992) interpreted these findings as consistent with research in the area of social comparison theory (e.g., Erber & Tesser, 1994; Salovey & Rodin, 1984; Salovey et al., 1991; Tesser, 2003; Tesser et al., 1991) given the performance of the student was much more relevant for the student participants compared to that of the golfer.

2.3.6.2 Empirical research examining the influence of context on attitudes towards Tall Poppies

Finally, and especially important to the present research being conducted into the problem of the brain drain, are the findings of how tall poppies were rated across different domains. That is, are the findings relating to the perception of tall poppies applicable across different tall poppies? Feather et al. (1991) reported that sportspersons and some entertainers were rated more favourably when compared to the other group of politicians. Coupled with a finding in the previous section on the rise and fall of tall poppies where the golfer was envied more than the students (Feather & McKee, 1992), it is important to understand more about the reasons why persons may differentiate and evaluate between specific sorts of tall poppies.

Of particular note to the present research is the effect of context on the perception of high achievers. Research by Feather and colleagues (Feather & McKee, 1992; Feather, et al., 1991) has found that perceptions of high achievers vary across contexts, such that sportspersons were generally found to be more favoured when compared to politicians or entertainers. Whilst there were a few different contexts examined (i.e., sportspersons, politicians, entertainers) this was not the focus of Feather's research. Importantly though, Feather et al. (1991) found that evaluations of public figures were related to the domain in which they were eminent. Participants rated figures from the sports domain more favourably when compared to those from the entertainment and political areas. In general they rated sportspersons as having achieved success due to ability and effort and less to ability or luck when compared to politicians or entertainers. Also, sportspersons and some others in the entertainment and political arena were seen to deserve their position more when compared to the others. However, this is not

surprising given that deservingness ratings for achieving one's present position were highly correlated with attributions for success of ability (r = .61) and effort (r = .64).

Finally, a study carried out by Grove and Paccagnella (1995) looked at attitudes towards several tall poppies in the domain of sport. The study examined the effect of publicity deemed to be negative for the sportspersons (i.e., being gay, being HIV positive, or using steroids) on attitude ratings and judgements of personality characteristics. Overall and inline with predictions, results for personality characteristic differences between the groups also showed more positive attributions towards sportsperson who had not received publicity for being gay, being HIV positive, or using steroids. Furthermore, athletes who had not received negative publicity were perceived as possessing more integrity, honesty, trustworthiness, as well as being more self-controlled and rule-oriented when compared to the athletes who had received publicity for being gay, being HIV positive, or using steroids. This demonstrated a sound link between attitudes towards tall poppies and ratings of personality characteristics, which is an important association for the present thesis.

2.4 Summary of research into Tall Poppies and directions for the present research

The research program carried out by Feather and colleagues (see Feather, 1994a; 1996 for a listing), as well subsequent studies using his scale (Grove & Paccagnella, 1995; Paccagnella & Grove, 2001), has provided a very comprehensive investigation into a somewhat unique Australian cultural belief that people take pleasure in bringing down someone of status. The studies reviewed in the previous sections have used theoretical approaches of value theory, attributional theory, and deservingness in order to provide a thorough and widespread understanding of what influences perceptions of high achievers. Whilst the various studies by Feather and others investigated numerous variables relating to the tall poppy syndrome, there are several areas that have been neglected. Feather has taken the tall poppy phenomena and structured it as an attitude towards high achieving persons, or persons of status. Broadly speaking, there is no support that high achievers are despised, or that people want to lop tall

poppies from their positions. Rather, the tall poppy syndrome appears to be one that is qualified by variables such as values, deservingness, context, and personality characteristics. Feather (1989a) found that high achievers were generally perceived to possess more positive qualities (i.e., favourable personality characteristics) when compared to average achievers and were more likely to have their success attributed to effort and ability and less to good luck when compared with average achievers.

Furthermore, persons were viewed more favourably when their success was due to controllable events such as effort and ability when compared to uncontrollable events such as good luck (Feather, 1992). Research that examined the role of values in the perception of high achievers found that support for tall poppies was related to values concerned with achievement (e.g., ambitious, influential, capable) and power (e.g., social power, wealth, social recognition), whilst tradition maintenance values (e.g., respect for tradition, being humble, devout) and to some extent values concerning equality (i.e., concern equality of opportunity and equality of condition of state) were related to the favour fall of tall poppies (Feather, 1989a; Feather, 1993a).
Additional findings also suggested that personality characteristics were important in the evaluations of tall poppies. Good tall poppies were rated higher on positive affect and deservingness (Feather, et al., 1991) when compared to bad tall poppies, who were viewed as less deserving of their success and elicited pleasure if they were to fall. Furthermore, research by Grove and Paccagnella (1995) demonstrated a link between attitudes towards the high achiever and the rating of their personality characteristics, as it was found that persons ascribed personality characteristics in the same direction that they expressed attitudes towards them. That is, when attitudes towards tall poppies were positive so were the personality traits ascribed to them, and vice-versa.

Key individual differences have been shown by Feather and colleagues to have demonstrable links to the support or fall of a tall poppy. Global self-esteem has been found to be inversely related to the support and fall of tall poppies, such that persons lower on self-esteem are more likely to favour the fall of tall poppies and persons higher on self-esteem are more likely to favour the reward of tall poppies (Feather, 1991a, 1998; Feather, et al., 1991). Furthermore, these results were also replicated across a Japanese sample (Feather & McKee, 1993), perhaps

indicating a universal link between global self-esteem and the perception of tall poppies.

According to Feather (1994a), tall poppies "may be presidents or prime ministers, kings or queens, high-profile entertainers, business leaders, individuals who have risen to the top of the ladder in the field of sport, or high-status people in literature, sciences, and the arts" (p. 2). The tall poppies examined by Feather have been sportspersons (Feather, 1991a), celebrities (Feather, et al., 1991), politicians (Feather, 1993c, 1993d), and high school students in the classroom (Feather, 1989a). With the exception of the latter study, these studies have exclusively looked at tall poppies in the public not known for their intellectual achievements. Thus, given the importance of understanding the influence of the tall poppy syndrome on the brain drain, this thesis will examine high achieving and high-status people in literature, sciences and the arts, to see if attitudes towards these groups are due to the tall poppy syndrome.

An important and generally overlooked factor that could influence the perceptions of tall poppies is therefore the context in which they are successful. It could be argued, with the odd exception as mentioned above, that sportspersons generally do not suffer from the tall poppy syndrome. Perhaps this is the case for sportspersons because effort and ability are more salient. Whilst this could be seen as a result of the level of deservingness, context or domain may also play a part in the perception of persons of status. The present research concentrated on the perception of tall poppies outside of the domain of sport, more specifically tall poppies that could be classified as intellectuals. By virtue of also being high achievers, one could posit that intellectual high achievers (e.g., academics, scientists, and researchers) might not be susceptible to the same critique as the other tall poppies. That is, attitudes towards intellectual high achievers could be based on different evaluative dimensions to those of non-intellectual high achievers (e.g., deservingness of having achieved their present position). Furthermore, judgements of these intellectual tall poppies could also be a result of other salient dimensions of the target (i.e., intellectualism) when compared to non-intellectual high achievers. Thus, it is important to outline and define the construct of anti-intellectualism for the present research.

CHAPTER 3

ANTI-INTELLECTUALISM THEORIES AND RESEARCH

...[Humankind has] a great aversion to intellectual labour; but even supposing knowledge to be easily attainable, more people would be content to be ignorant than would take even a little trouble to acquire it (Boswell, 1791/1987, p. 75)

3.1 Overview of the Chapter

If we are to test whether the Tall Poppy Syndrome applies to intellectual high achievers, then the terms relating to intellectual and anti-intellectualism need be defined. An agreed definition of anti-intellectualism is very difficult to come across, with numerous arguments of the definition and usage of this term. Due to its disputed definition, Chapter 3 will explore an historical account of the usage and will highlight a demarcation between dispositional and attitudinal operationalisations of the term. Moreover, this chapter will on the most part review anti-intellectualism literature utilising non-Australian examples given the sheer volume of research carried out in America (e.g., Eigenberger & Sealander, 2001; Hofstadter, 1963; Rigney, 1991).

Chapter 3 will move towards defining anti-intellectualism as an attitude, demonstrating that it is culturally embedded within the fabric of society rather than being a dispositional quality in men and women. Due to the lack of social scientific research into anti-intellectualism, seminal ideas by Hofstadter (1963) which were later reconceptualised by Rigney (1991), will be used to highlight the areas in which anti-intellectualism is rife as well as providing a theoretical conceptualisation of three types of anti-intellectualism. In addition, Chapter 3 will detail reports from the magazines and newspapers to emphasise the social concerns and movements within both American and Australian societies regarding anti-intellectualism, thus demonstrating how it is intertwined within the social and cultural fabric rather than a product of individuals.

The limited research examining anti-intellectualism in social scientific circles will also be evaluated. A sociological perspective understanding anti-intellectualism is presented (Scalmer, 2005), followed by social psychological

research by Yuker and Block (1964) who attempted to measure a continuum of intellectual versus pragmatic attitudes. More recently however, research by Eigenberger and Sealander (2001) initiated a heated exchange (Eigenberger, 2002a, 2002b; Howley, 2002; Joseph, 2002) due to its claims of anti-intellectualism as a personality trait. Importantly, this scale developed by Eigenberger and Sealander will be re-conceptualised as an attitudinal measure of anti-intellectualism, in order to move towards an operationalisation for the present research.

3.2 Historical Anti-Intellectualism

Around the beginnings of the Hellenistic Period (circa 323 B.C.), the dominance of the Grecian Empire gave way to ancient Rome. This period for the Grecians also marked a move from Irrational to Rational thinking in their society. In his book *The Greeks and the Irrational*, Dodds (1951) described the Grecian society as being very open at that time. Both Auden (1941) and Popper (1966a; 1966b) paint an open society as one where there are no physical, economical, and cultural barriers, and there are rational choices made between alternatives. In contrast, a closed society is physically segregated, economically autonomous, lacks cultural contact with other communities and behaviours are unconscious where the people living in it have no idea of making a choice. The reason put forth by Dodds as to why the Grecians were a very open society rests on this movement from the Irrational to the Rational. That is, the third century B.C. saw the beginnings of the great intellectual age of discovery with the founding of the Lyceum, a school started by Aristotle that studied astronomy, physics, logic, aesthetics, music, drama, tragedy, poetry, zoology, ethics and politics. This was the point of demarcation when Greek science and arts moved from disordered study to a methodical discipline.

The movement in the Greek society from one that solely worshipped mythology and popular belief, to a cultural and cosmopolitan society where the beliefs of intellectuals became wider, marked a change from the Irrational to the Rational. Dodds (1951) noted that this societal change promoted more interaction between the people and the intellectuals. Protagonists such as Socrates, Plato, and Aristotle, to mention a few, introduced a flood of new ideas

to the Athenian community, making it the intellectual and artistic centre of the Greek World. Inevitably, this also brought with it the rise of pseudo-scientific literature on subjects such as astrology, beliefs in forces imminent in animals, plants, and precious stones (Dodds, 1951). Circa 100 B.C. this movement that was gaining momentum parallel to the move from the Irrational to the Rational eventually won over the populace as Rationalism slowed down. Dodds speculated that this slow down was not solely due to a loss of political freedom that discouraged intellectual enterprise, or due to the increasing favouritism of magic and divination, but one of a fear of freedom. That is, the unconscious burden placed on members of an open society by individual choice.

More recently, research has conceptualised epistemic styles as being dispositional and dualistic in nature (Eigenberger, Critchley, & Sealander, 2007). An epistemic style is described as the manner in which an individual defines knowledge, acquires it, applies it, and justifies beliefs and differs from cognitive style that is a general array of perceptions. Eigenberger et al. noted that distinctions between two cognitive styles have often been labelled as *common* and *reflective*, or *dogmatic* and *skeptical*. Furthermore, the authors' recount historical examples as support for these dualistic styles in philosophy, starting off with ancient Greek tales from Socrates and Plato as support for an individual difference of a ubiquitous dual-processing cognitive function.

The Socratic thinker, portrayed as the main character in many of Plato's works (Eigenberger, et al., 2007; Hamilton & Cairns, 1961), is said to be a rational agent, curious, and open minded. Eigenberger et al. (2007) contrasted this so-called dispositional style of individuals who sit on the spectrum from simple, reflexive operators, to dogmatic, self-interested theorists. This is exemplified in several plays by Plato where two distinct epistemic styles are found. In the seventh book of Plato's *The Republic*, the Allegory of the Cave, readers are told about the enlightened prisoner and those in the dark. In *Euthyphro*, the strategies pitted against each other in the search of knowledge are a Socratic versus a dogmatic appeal to authority. Eigenberger et al. also points to *Theaetetus* as an example where there is a protagonist, a critical questioner who searches for knowledge, and the antagonist, someone whose thinking is structured by social, political or religious orthodoxy. Additional examples of this

dispositional mode of epistemology derived from the works of both Hume and Dewey are presented by Eigenberger et al.

The *Treatise on Human Understanding* (Hume, 1739/1967) is an extensive investigation of the origin, nature, aims, and limits of human knowledge and understanding. Eigenberger et al. (2007) noted that in Hume's work there was a contrast between a common type of understanding and a critical one. The former consists of natural reactions and emotion-based opinions, whilst the latter type of understanding questions all ideas, including common sense ones, and evaluates them in light of their logical consistency. Parallels are drawn between Hume and Plato, as both have a tendency to describe humans in two minds, as those who "characteristically engage in either reflective, critical thinking, or (those) who remain comfortable within the cognitive limitations of opinion and common sense" (Eigenberger, et al., 2007, p. 10). Furthermore, Eigenberger et al. illustrated how Dewey (1910/1933) distinguished between the reflective or critical thinker. Described as reflective or critical thought, it is summarised as "active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusion to which it tends" (Dewey, 1910/1933, p. 9). Thus, Dewey's account of thinking styles is taken as support for the Eigenberger et al. thesis of two different types of cognitive styles.

On one hand, the aforementioned examples from ancient Greece through to modern day philosophy provided by Eigenberger et al. (2007) can be interpreted as support for a dispositional quality of intellectual preference. The authors developed a scale to measure a disposition towards knowing and believing, qualities associated with the intellect, and that are broadly categorises people in an *Intellective* versus *Default* position. On the other hand however, the initial discussion of the Greeks and the Irrational (Dodds, 1951) tends to suggest that non-dispositional factors, such as cultural, economic, and societal concerns of a loss of freedom, are influential in dictating factors like intellectual growth and sustenance. As such, it would seem presumptuous and disadvantageous to narrow the predictive conditions under which the intellect is valued, and more generally in beginning to understand intellectualism and anti-intellectualism. Thus, a look at recent history will reveal how anti-intellectualism is embedded in the cultural fabric within America, as well as in present day Australia.

3.3 Modern era Anti-Intellectualism

An arguably appropriate measure of gauging the social concerns and movements of a society at any particular time can be uncovered by reading through the printed press. There has been little written about anti-intellectualism in scholarly literature, thus investigating viewpoints from magazines and newspapers is useful in aiding our understanding of this attitude that is culturally embedded. Information from these sources is especially relevant, as they not only provide a snapshot of the populace's general attitudes, yet also reveal what the person outside of academic circles thinks about anti-intellectualism.

Reports from the nineteen-fifties and sixties in America provide an interesting historical snapshot of a time where anti-intellectual sentiments appeared to be widespread due to the political climate. Dreher (1962) noted that creativity suffered at the hands of anti-intellectual sentiments towards engineers who were in shortage. Described not only as an attack on the intellect, but more specifically as anti-science, Condon (1950) also related this suspicion and aggression towards intellectuals as being a part of the anti-science movements of that time. Condon was of the opinion that the widespread notion of anti-science was somewhat ingrained in a misunderstanding of the workings and goals of scientific research. For example, ignorance of the applications of scientific advancements outside of military circles could well have obfuscated perceptions of the benefits attributable to science. In addition, Condon illustrated that the criticism of applied science is rather specious; that is to say, that opposition to nuclear development for example, becomes infused with anti-scientific sentiments towards biology, medicine, agriculture, social sciences. The outcome can be a rejection of scientific progress, rationalised by weak claims such as "society cannot intelligently cope with the powers that science has already given us" (Condon, 1950, p. 268); ergo, scientific advancement must be stopped.

A parallel strain of anti-intellectualism described in the media comes in the form of religious opposition to the life of the mind. These historical accounts retold in the religious media give the rationale for anti-intellectual attitudes as a function related to the creativity of the mind, and the houses that nurtured it. Sources note that the development of anti-intellectualism came about when there was a shift from the legitimate suspicion of rationalism to the rejection of the

intellectual life (Maudlin, Neff, Lee, & Zoba, 1995). Perpetrators of this outlook were in some cases religious evangelicals often against the institutions, and individuals within them, who valued the life of the mind. For example, a religious magazine (Henry & Kantzer, 1996) was clear to delineate the negative attitudes towards the life of the mind that was being cultivated in liberal schools, versus intellectual ideals in general. From these reports (Henry & Kantzer, 1996; Maudlin, et al., 1995), opposition to intellectualism required an interaction with a locale or concentration of individuals who value the life of the mind. Arguably anti-intellectualism is reliant on the negative perceptions of individuals in a specific role, one that is deemed to house and nurture this life of the mind. Furthermore, it is not a stretch of the imagination to envisage universities and the circles of academia, as sharing and promoting some of the underlying values that are compatible with intellectual pursuits.

Stripped down to its most basic function, through the communication of ideas and trends, the media can play a central role in the equation of anti-intellectualism. Fleeting views of television as a medium can provide examples of anti-intellectualism (e.g., "Tunbridge Wells strikes back," 2004). In an amusing story on the intelligence of popular television, Mackowycz (2001) described the impact of the abundance of stupid television and other pop-culture media (i.e., cinema and radio) on the intellect. These popular cultural ideals (e.g., television wrestling, books targeted at “Dummies”, and the decline of talk radio) are seen by Mackowycz as manifestations of anti-intellectualism. Perhaps it is due to the immersive and hypnotic nature of television, as well as its passive nature of engagement, that makes it such a strong candidate in the field of anti-intellectual variables. Whilst most of these examples are taken from incidents abroad, striking similarities can be found when examining the attitudes towards the intellect in Australia.

Commentators and writers in the Australian media often share an agreement of an underlying attitude of anti-intellectualism. Letters to newspapers suggest that this attitude of anti-intellectualism is all pervasive within our culture (Porteus, 2001). Reports on a broad range of issues, such as the impact of negative attitudes towards the arts (Harper, 2002; Pearce, 2001), those against literacy and education (Delaney, 2001; Ribbon, 2001), and the value placed on sporting achievements above the achievements of intellectuals

(Mitchell, 2001), are but a few snapshots of the attitudes from the general populace. Moreover, Australia is comically portrayed as a place where "laid-back, beer-swilling, blokey anti-intellectualism" ran fervent until the nineteen-eighties (Buckell, 2003, p. 25). However, there is little humour in the claim that this anti-intellectualism derives from a culture riddled with bigotry (Shanahan, 2001). Additionally, reporters also tie anti-intellectualism with the political system in Australia. For example, Queensland's move to change the image of its police force as anti-intellectual (Doneman, 2002), or the creation of a new arts policy to increase the value of artistic pursuits (Osborne, 2002). Finally, an example given in the media within the political sphere is that of the former Fraser government being generally anti-intellectual ("Fraser to snub launch of official Liberal party history," 2001).

Recently a front-bench politician from the Australian federal opposition at the time, exclaimed that most Australians are anti-intellectual and hostile towards education ("Labor attack on anti-intellectual Aussies," 2006). Lindsay Tanner was critical that the former Australian government promoted anti-intellectualism, by exploiting and magnifying social prejudices that are embedded in the Australian culture (Price, 2006). Furthermore, hostility to learning is evident in Australia's lack of spending on tertiary education compared to other OECD countries (Illing, 2007; Lewis, 2007; Maiden, 2007), or the claims by researchers that there needs to be a turnaround from the "crude anti-intellectualism" of the former Liberal government so that researchers can move beyond the bureaucracy of paperwork and carry out research and teaching (Brennan & Malpas, 2008). In Tanner's (2006) speech at the Sydney Institute, he remarked that "Australia is one of the few countries in the world where academic is a term of derision. We worship sportspeople and ignore intellectual achievers. We revere the practical and physical, and barely tolerate the cerebral" (p. 13). So, it can be seen within the political and educational spectre that talk of anti-intellectualism in Australia is alive and well.

References to anti-intellectualism in newspapers and magazines are useful in painting an image using broad brush strokes. The aforementioned examples describe anti-intellectual attitudes as relating to the suspicion of the intellect, and moreover, relating to social, religious, and political circles (e.g., anti-science movements). In addition, intertwined in these mistrust of

intellectuals, and in some cases their research, was linked to the perception of the values in those groups. That is, the mistrust of the schools and the universities were viewed as facilitating liberal thinking and nurturing the life of the mind, arguably integral to intellectual ideals. Further support for the notion that anti-intellectual attitudes are somehow tied in with values can be seen in reports of the role of popular culture (e.g., Buckell, 2003) and television (e.g., Mackowycz, 2001) on devaluation of intellectual ideals. Given this information about the conditions under which anti-intellectual attitudes manifest and play out, there is still no consensus as to what embodies this negative attitude towards the life of the mind (or whether in fact intellectualism is indeed the life of the mind). The following section will seek to review and establish a suitable definition for terms such as intellectualism and anti-intellectualism.

3.4 Anti-Intellectualism in American Life

Hofstadter's Pulitzer Prize-winning *Anti-intellectualism in American Life* (1963) was the first detailed attempt at seeking to understand the history, complexities, and the forces of anti-intellectualism in the American culture. A key distinction drawn early on in this tour de force is between intelligence and intellect. Hofstadter noted that whilst intelligence seeks to grasp, manipulate and reorder, the intellect is the critical, creative, and contemplative side of the mind. On the other hand, intelligence seizes the immediate meaning of a situation and evaluates it. In comparison the intellect "examines, ponders, wonders, theorizes, criticizes, imagines" (Hofstadter, 1963, p. 25); it evaluates the evaluations. One can visualise intelligence as working within a framework of clearly stated limited goals, whilst the intellect is not constrained within this box and freely moves in and beyond it.

An intelligent person is not necessarily an intellectual, and there is a broad spectrum of intelligence levels across intellectuals (Hofstadter, 1963). Hofstadter labels the professionals who live off ideas, and not for them, as *Mental Technicians*. These are individuals who have stock skills and can apply them, yet are missing qualities that relate to intellectuals – "generalizing power, free speculation, fresh observation, creative novelty, radical criticism" (Hofstadter, 1963, p. 27). The *Mental Technician* uses their mind as an

instrument to pursue the endpoint of a fixed problem, in contrast to the intellectual who lives for ideas and creativity. In other words, there are intellectuals and pseudo-intellectuals, of which the latter are often masqueraded and heralded as intellectuals, yet are nothing more than intelligent problem solvers.

The intellectual lives for ideas and brings something more than required to his or her job, however is sometimes looked upon with resentment and suspicion more so than the intelligent person who is praised. Penned in the shadows of McCarthyist sentiments of the previous decade, Hofstadter (1963) commented that the labels associated with intellectuals were on the whole negative. Intellectuals were described as pretentious, conceited, effeminate, and snobbish. In addition, they were also characterised as immoral, dangerous and subversive. Whilst Hofstadter guided the reader through a detailed history of anti-intellectual sentiments in America's history, stories were recounted of the anti-intellectual development through the nineteenth and twentieth centuries. *Anti-intellectualism in American Life* told of an anti-intellectual strain within the cultural fabric of America, which fluctuated depending on factors such as political, social and religious, and economic trends. Thus, it seems that anti-intellectualism could be thought of as an attitude tied in with the social norms and milieu of the time. Similarly, McWilliams (1955) described this as thought control related to the restriction of political, social, and economic ideas. As Hofstadter portrayed:

> [People] do not rise in the morning, grin at themselves in the mirrors, and say: "Ah, today I shall torment an intellectual and strangle an idea!" Only rarely, and with the greatest misgivings, then, can we designate an individual as being constitutionally anti-intellectual… what is important is to estimate the historical tendency of certain attitudes, movements, and ideas (p. 22).

On the subject of attempting to define intellectualism and anti-intellectualism, Hofstadter (1963) noted that this was a rather difficult task.

> As an idea, it (anti-intellectualism) is not a single proposition but a complex of related propositions. As an attitude, it is not usually found in a pure form but in ambivalence – a pure and unalloyed dislike of intellect

> or intellectuals is uncommon. And as a historical subject, if it can be called that, it is not a constant thread but a force fluctuating in strength from time to time and drawing its motive power from varying sources… The common strain that binds together the attitudes and ideas which I call anti-intellectual is a resentment and suspicion of the life of the mind and of those who are considered to represent it; and a disposition constantly to minimize the value of that life (p. 7).

The work of Hofstadter (1963) provides a good foundation from which to understand the complexities of anti-intellectualism. Importantly it distinguished intellect from intelligence, arguing that there can be persons of intelligence who are not necessarily intellectuals. These persons can be classified as Mental Technicians, individuals who have skills and know how to apply them within limited but clear goals but are distinguishable from intellectuals as they do not possess the qualities of free speculation, fresh observation, creative novelty, radical criticism, and generalising power (Hofstadter, 1963). Furthermore, Hofstadter argued that anti-intellectualism is not a disposition that occurs in individuals, but rather an attitude tied in with norms associated with cultural movements that fluctuates over time surrounding political, social and religious, as well as economic ideas; one that may be expressed in various ways, such as an attack on the merits of science, education, or literature.

3.4.1 Political anti-intellectualism

In the detailed account put forward by Hofstadter (1963) on the subject of anti-intellectualism within American culture, examples were drawn from a flux in sentiments towards intellectual activities parallel to political ideologies. Intellectualism was unhindered until the Jacksonian presidency in the early 1800's, where Jackson appealed to egalitarian ideals of the nation after a period of British Rule. On the other hand, Abraham Lincoln who presided in the middle of the nineteenth century, was portrayed as scholarly with his candlelight reading and was seen as a reflection of the availability of universal education which he envisaged for Americans (Leuchtenburg, 1955). Theodore Roosevelt, who was The American president at the beginning of the twentieth century, was an intellectual and although he appealed to people based on his physical attributes of

strength and masculine image, was able to bring about an intellectual and rational approach into the government (Bishop, 1976). Woodrow Wilson on the other hand, who presided shortly after Roosevelt, was an intellectual and yet quite anti-intellectual (Bishop, 1976; Hofstadter, 1963) given his fear of the *expert* in politics. Bishop described this reflection in the political climate as due to a fear of knowledge. According to Bishop, the nineteen-twenties and thirties were somewhat of an intellectual drought, followed by a rise of the Ku Klux Klan and events such as the Scopes trial – the court case of the biology teacher charged with illegally teaching the theory of evolution.

During the Second World War, Franklin D. Roosevelt led an influx of intellectuals into the government, bringing them closer to power than ever before. However, the nineteen-fifties in America involved a peak in negative sentiments towards intellectuals. During the presidency of Eisenhower (1953-1961), there was a strong delineated strain of anti-intellectualism. Quoted as saying, an intellectual is "… [a person] who takes more words than are necessary to tell more than … [they know]" (Eisenhower, 1954, p. 4), president Eisenhower was characteristic of the sentiments in a time where the intellectual was fair game. It was McCarthyism, and the communist control act of 1954 (McWilliams, 1955) that contributed heavily in the fear of a critical mind (Hofstadter, 1963), and a gain of political power. Gilbert (1955) asserted that the government maintained political power by exploiting the fear and insecurities of people through the intimidation of the free enquiry of intellectual work. Anti-intellectualism was in part a result of this political pressure (Clapp, 1955); one that transformed into a perceived security risk and reservation of intellectuals working in the government.

On the other hand, John F. Kennedy turned to the universities in order to help solve problems, such as questions encountered in the race to put an astronaut on the moon (Bishop, 1976). In an article describing the shortage of engineers with creativity, Dreher (1962) argued that it was not political conservatism that interfered with the creativity, rather it was anti-intellectualism. This anti-intellectualism comes out with the rejection of idiosyncrasies of any kind, even when they are linked with exceptional creativity (Dreher, 1962). The "Golden Fleece" awards exemplified political ramifications of such views towards intellectuals. These pseudo-awards, handed out by the National Science

Foundation courtesy of Senator William Proxmire in 1975, were used to list so-called outrageous wastes of projects, and to single out individuals who had been funded by the government (Shaffer, 1977). These farcical awards opposed scholarly activity and research by devaluing knowledge, whilst curbing the creativity of the individuals and establishments from whence they came.

These examples of fluctuation in the attitudes towards intellectuals and intellectualism alongside political influence illustrate a possible impact of ideologies on the perception of intellectual activities. George W. Bush is perhaps the newest non-intellectual president of the United States of America (Gitlin, 2000), and perhaps the most anti-intellectual one of the past 165 years (Claussen, 2004). However, there are two sides to the coin named anti-intellectualism. Whilst political ideologies can have a detrimental effect on the perception and acceptance of the intellect in society, the converse also holds true such that funding for the arts and sciences can flourish depending on the government of the time. On the other hand, it is startling to imagine that anti-intellectual sentiments can be used to promote fear and intimidation of intellectuals that can lead to outcomes such as public ridicule of research or loss of work, to mention a couple. It would be fair to presume that some of the social cues in society are taken from political circles, and that international perception of intellectuals and their pursuits are greatly coloured by political orientation. Outside of politics, Hofstadter (1963) argued that social and religious factors have moulded the perceptions of intellectuals for Americans throughout its history.

3.4.2 Social and religious anti-intellectualism

An historical account of the social, religious, and educational ideals within the American culture is valuable in understanding anti-intellectualism. In an analysis of the chronology of anti-intellectualism in the United States of America, Leuchtenburg (1955) traced the origins of hatred and mistrust towards intellectuals to the Darwinian challenge to fundamentalism. The scholarly criticism of the bible that arose out of the scientific writings of Darwin created a divide between intellectuals and the people. As seen in the form of the Scopes trial, this criticism was a challenge to the already long established religious values of the American community. As Hofstadter (1963) noted in his account

of the founding fathers of the nation, through their evangelical, puritanical, and revivalist movements that there were attacks on the intellect even from those who were learned in the community. This may be exemplified by John Cotton, an intelligent New England Puritan writer who in 1642 wrote, "The more learned and witty you bee, the more fit to act for Satan will you bee" (Cotton, 1642, p.39). It was common place for these fundamentalists to reject anything that was elitist, instead favouring practicality, common sense, and native intelligence above creativity and freedom of thought (Leuchtenburg, 1955).

Baker (1986) rationalised that negative views against intellectuals were not just some sort of anti-technology, but rather were a result of fundamentalism and anti-intellectualism. Anti-intellectualism is against the freedom of thought, creativity, and intellectual pursuits. Furthermore, contemporary fundamentalism, a rigid adherence to fundamental religious principles and intolerance to other views, is anti-science in that it is against challenges of the bible (e.g., Darwinism) yet not anti-technology. Baker noted that fundamentalists do not question the technology that has brought them wealth or luxuries in life, and subsequent contemporary anti-intellectualism from fundamentalist ideologies can be seen as a part of anti-science. The basic rationale for these sentiments is that the belief in God, as perceived by the fundamentalists, does not want independence of thought given all events are predetermined. In addition, Baker argued that this contemporary anti-intellectualism is anti-authoritarian in nature, since people who lack the ability or preference to understand science mistrust it or reject it as being sent down by an authority. Although fundamentalism cannot entirely account for anti-intellectualism,

> it is a small but very visible aspect… which contributes both to a loss of will and to a loss of the desire and ability to do the difficult realistic thinking which is required to restore a sense of controlled destiny in our increasingly complex and problem-ridden society (Baker, 1986, p. 84).

Anti-intellectual sentiments are often harboured in these places of learning, such as the education system, a place where intellect can be nurtured and developed. In a review of literature associated with negative attitudes towards school and education, Vail (2001) described the American populace as one that does not highly value the intellect. Similarly, Hofstadter (1963) argued

that the intellect is resented as a form of power or privilege. Adjustment school, a pseudo-intellectual philosophy of teaching introduced to American public schools in the twentieth century, essentially favoured teaching practical information above intellectual learning for the benefit of real life applicability (Hofstadter, 1963; Isaacson, 1982). Vail noted that in general, school culture devalues the intellect, and that the critical mind is something that is required by all members in a democracy if they wish to participate in it. Suggestions by Vail on how to move away from the ethos of anti-intellectualism include introducing liberal arts (e.g., literacy and philosophy) to all students, visually rewarding academic success, and encouraging the arts to all students as a beneficial part of education, not just for those who want to continue with further studies.

A perspective on anti-intellectualism from the librarian is shared by Isaacson (1982), who discussed the perceptions and resulting biases that are attributed to this group. An issue raised Isaacson's paper is that there is a social perception that intellectuals are more important or too competent. This view seems to legitimise and enforce the view of a non-egalitarian divide, and one that has negative connotations. Isaacson classes anti-intellectualists as those who call others elitist or anti-democratic, arguably in an attempt to ostracise and intimidate them. The intellectual has the "capacity to make discriminating judgements; the chief characteristic of an anti-intellectual is to 'discriminate' against that very capacity" (Isaacson, 1982, p. 232).

3.4.3 Business and economic anti-intellectualism

Another aspect of social life that is relevant to understanding anti-intellectual strain is that of the business and economic world. Leuchtenburg (1955) related this negative view as part of the rise of the social scientists who questioned the supremacy of the businessperson and politician. This was due to a perceived threat in established social values, such as laissez-faire capitalism that challenged the expertise in social affairs run by businesspersons and politicians and resulted in attacks on the intellectuals from those well-educated people in the business community and political arena (Hofstadter, 1963; Shaffer, 1977). It is the businessperson who values money and power, whilst the intellectual who values quality and moral ideals (Hofstadter, 1963). These basic, but distinct set of

values and motivations, are perhaps what businesspersons perceive as the threat to their centralised power.

The relationship between the intellectuals and the businessperson is a complex one that involves acceptance and concessions on certain values. Hofstadter (1963) noted that:

> the position of the critical intellectual is thus a singularly uncomfortable one: in the interests if … [their] work and livelihood … [they] (the intellectual) … extend one hand (to the … [businessperson])… but in … [their] concern for high principles and values … [their] other hand is often doubled into a fist (p. 236).

In addition, Hofstadter (1963) described the ubiquitous nature of the business community and its relationship to intellectuals:

> … [The businessperson] is everywhere; … [they fill] the coffers of the political parties; … [they own or control] the influential press and the agencies of mass culture; … [they sit] on university boards of trustees and on local school boards; … [they mobilize] and finances cultural vigilantes; … [their voices dominate] the rooms in which the real decisions are made (p. 235).

As such, the intellectual must balance his or her stance on values of intellectual quality and integrity on one hand with the world that is ruled by the businessperson who seemingly devalues these notions and even despises them.

Gilbert (1955) argued that certain aspects of authority have led to anti-intellectual thoughts in the community, often with similar motivations. These authorities are referred to as demagogues, persons who seek "notoriety and power by exploiting the fears and desires of the people, offering scapegoats and dogmatic panaceas in an unscrupulous attempt to hold himself forth as the champion of their values, needs, and institutions" (Gilbert, 1955, p. 51). A common theme as to why businessmen, or those in positions of authority, are against the intellect is due to a fear of the expert and their knowledge in areas that could threaten the status of those in power. Additionally, business values and rewards pragmatism over creativity or innovation, drawing support from the parallel views held by the American populace who are generally suspicious of the intellect (Hofstadter, 1963; Leuchtenburg, 1955; Shaffer, 1977). If the

authorities can perpetuate this fear of the intellect, then this can act as a suppression of the intellect's creativity and innovation in order to maintain its current status quo.

3.5 Rethinking Hofstadter

In a paper that re-evaluated and rethought the analysis by Hofstadter (1963), Rigney (1991) examined the role of anti-intellectualism in America. The paper by Rigney was brought about due to a concern for the quality of education and public discourse, as well as the perception that the quality of intellect in America was being degraded by cultural forces inimical to it. In Rigney's analysis of Hofstadter's seminal work, it was noted that anti-intellectualism was a persistent and recurring pattern in American cultural history yet it has received little attention from social scientists perhaps due to the vagueness of the term itself. According to Rigney, Hofstadter implicitly identified three types of anti-intellectualism that each originated from its own distinctive institutional or social-structural matrix: religious anti-rationalism, populist anti-elitism, and unreflective instrumentalism.

Religious anti-rationalism is associated with religious structures, and particularly with evangelical Protestant denominations (Rigney, 1991). It does not refer to Cartesian rationalism, that is reason rather than experience is the foundation of certainty in knowledge, but rather a commitment to the value of critical thought and reasoned discourse in general. Religious anti-rationalism relates to the early religious structures in American history, particularly to evangelical Protestant denominations, and is based on the assertion that there is no room for rational inquiries into the absolute beliefs of religion; religion is more a matter of the heart than the head and rational and empirical inquiry into the claims of religion will corrode their validity and appeal. Furthermore, Rigney argued that rationality promotes relativism and social disintegration by challenging the sanctity of absolute beliefs.

Populist anti-elitism is associated primarily with populist political structures and movement. It is expressed in the view that the values of the intellect are "elitist". Rigney (1991) illustrated populist anti-elitism as the perception that intellectuals are viewed as the absent minded professor on one

hand, but as an abstruse and perhaps a subversive elitist on the other. Populist anti-elitist attitudes stem from the view that the values of the intellectual are elitist and their superior knowledge is used for class privilege. Whilst Rigney noted that there has been a partial reconciliation of tension between populists and intellectuals, there still remained a "mistrust and resentment toward intellectuals among those who have been systematically excluded from privileged access to the culture of critical discourse" (p. 444).

Unreflective Instrumentalism is associated primarily with the economic structures of American capitalism (Hofstadter, 1963). Rigney (1991) defined this as the "devaluation of forms of thought that do not promise relatively immediate practical payoffs" (p. 444). It can be thought of as placing value on practicality, material commerce, and expedience, while diminishing the import of introspection, analysis, and critical thinking (Eigenberger & Sealander, 2001). Instrumentalism restrains questions about the ends toward which practical and efficient means are directed, and is distinct from anti-rationalism and anti-elitism as it requires technical reason and rational calculation as well as requiring ideas that promote the interest of elites (Rigney, 1991).

Rigney (1991) also went further to suggest that perhaps there is now a fourth type of anti-intellectualism known as unreflective hedonism. That is, an avoidance of the hard and often painful work of reflective thought. Thus, it is apparent that anti-intellectualism is still rife in American culture, even if the dominant ones at present are represented in unreflected tendencies (Rigney, 1991).

3.6 Social Scientific Research into Anti-Intellectualism

The following section aims to review the Social Scientific literature relevant to the understanding of intellectualism, anti-intellectualism, and related constructs. To date, there has not been much work carried out by social scientists in the area of anti-intellectualism. In 1955 an entire issue of the Journal of Social Issues was dedicated to anti-intellectualism. The editor described anti-intellectualism as:

> a fairly broad attitude or value; more accurately, a negative attitude or prejudice against those who believe that society continually changes, and

> who favour using scientific and democratic methods to guide and control the changes. Like all attitudes this one is learned, and its major social determinants from personality factors and family influences right through to the American cultural tradition will be discussed…" (Sargent, 1955).

Following from this, Wolff (1964) commented that anti-intellectualism refers to two things: "hostility or related feelings toward ideas and other intellectual matters, and hostility and the like toward kinds of people who in some fashion stand for such matters" (p .49). Like Auden (1941) who said that anti-intellectualism draws on the fears of the age of anxiety, Wolff suggested that anti-intellectualism against intellectuals develops from the fear or distrust of people. According to Wolff intellectuals are not necessarily people such as scholars, artists, philosophers, or authors; an intellectual is a person concerned with ideas and devoted to the spirit of such ideas. Wolff related anti-intellectualism to attitudes towards tradition; for example the clash between the tradition of science and religion. Furthermore, Anti-intellectualism may also be closely related to anti-academicism, and linked to pragmatism (Wolff, 1964).

3.6.1 Four different kinds of Anti-intellectualism

Scalmer (2005) proposed a typology of four different kinds of anti-intellectualism. The work was based on Woolf's *Quack, Quack* (1935) and Hofstadter's *Anti-Intellectualism in American Life* (1963). Whilst Scalmer noted that Woolf does not refer to anti-intellectualism per se, the tone set by the book speaks of a revolt against reason and intelligence by habit, custom, superstition and taboo. According to Scalmer, Woolf suggested two forms of intellectual quackery. One related to the historical arguments that justified the revolt against civilisation, and established hierarchies of race and class. The other related to religion and philosophy, which discredited reason, science, and common sense. It was the opinion of Woolf that people must opposed these trends, or else the end was near (Scalmer, 2005). The work of Hofstadter has already been analysed in previous sections. So, the following sections will present Scalmer's analysis of these works and his devised typology for anti-intellectualism.

Although Scalmer (2005) was grateful to both Hofstadter (1963) and Woolf (1935) for extending the understanding of anti-intellectualism, he was also

critical of some of their findings. Firstly, Scalmer posited that the claim by Woolf and Hofstadter that anti-intellectualism is associated with a social strata or hierarchy are unsubstantiated. Secondly, Scalmer claimed that the authors manipulate anti-intellectualism by linking it with political enemies such as fascists, imperialists, selfish elites, and fashionable pedagogues to bolster their own arguments and reject alternatives from outside of scholarly practice. Thirdly, Scalmer questioned the validity that anti-intellectualism is used by economic elites to safeguard privilege, countering that anti-intellectualism is used in the fight for economic redistribution. Finally, Scalmer argued that Hofstadter and Woolf both recounted that anti-intellectualism was so tied in with a lack of education and small town life, then it should not be possible to still see anti-intellectualism today in a society that is well educated.

Influenced by the work of Bourdieu (1969) on the intellectual field, Scalmer (2005) went on to pronounce that anti-intellectualism can be differentiated along two axes. Bourdieu argued that the intellectual life can be thought of as a contest held on a "particular terrain or 'field' with its own rules of engagement, institutional parameters, force-field of relations, and logic of production and interaction" (Scalmer, 2005, p. 6). A field is a setting where agents and their social positions are located. This field exists in the context of political and economic fields, and the intellectual is not just a player on this field but an active agent that takes values specific to their field and applies them to a struggle or debate (Scalmer, 2005). Scalmer proposed a two by two matrix to classify the varieties of anti-intellectualism, comprised of two axes: 'articulation' and 'field orientation'.

According to Scalmer (2005) the axis of Articulation can be either expressed or projected, whilst Field-Orientation can be offensive or defensive. Scalmer specified four distinct forms of anti-intellectualism that are presented in Table 3.1: a threat, a limit, an intervention, and a discipline. Expressed anti-intellectualism involves the assertion of non-intellectual values (i.e., practicality, cost, efficiency and order) against intellectual values (i.e., truth, autonomy, rationality). On the other hand, projected anti-intellectualism involves the identification of anti-intellectual conduct on the part of others (e.g., criticism or attack from non-intellectual fields). Offensive anti-intellectualism entails and

incursion into another 'field'. Defensive anti-intellectualism is the reaction from within a given 'field' in response to an incursion from outside it.

Table 3.1

A Matrix of the Varieties of Anti-Intellectualism

Form of Articulation	Field-Orientation	
	Offensive	Defensive
Expressed	Threat	Limit
Projected	Intervention	Discipline

Notes: From "Understanding Anti-Intellectualism," by Scalmer (2005)

Anti-intellectualism Threat occurs when non-intellectual values are expressed within the intellectual field, and according to Scalmer (2005) is the most popular brand of anti-intellectualism. Examples given by Scalmer include when there is public disquiet about genetic research or attempts at censorship, which could reflect values of conservatism. Anti-intellectual Limit happens when values are asserted outside the intellectual field in response to intellectual incursions, often when criticism of expertise is used defensively. An example of this is when bureaucrats are frightened of expert scrutiny of their activities (Scalmer, 2005). Anti-intellectual Intervention occurs when anti-intellectualism is identified and criticised outside of the intellectual field. The opposition to governments that fail to fund the arts and sciences is an example of Anti-intellectual Intervention. Anti-intellectual Discipline is the kind of anti-intellectualism that occurs within the intellectual field, and is a tool in the battle for supremacy inside the intellectual's world (Scalmer, 2005). An example of this kind of Discipline anti-intellectualism is the attack on media punditry by academic political commentators (Gitlin, 2000).

The work by Scalmer (2005) has extended the understanding of anti-intellectualism through the classification of different types according to the two axes. The typology is a useful one and disentangles the term anti-intellectualism into a clearer delineated concept. In particular, the more relevant subtypes for the present research are found in the Expressed types of anti-intellectualism, namely Threat and Limit.

3.6.2 Anti-intellectualism as an attitude

Unpublished findings by Yuker and Block (1964), contain perhaps the only scale which has attempted to measure anti-intellectualism as an attitude. Based on a scale measuring intellectual attitudes among college students (Hegge, Wilcox, & Clausen, 1939), this scale measured attitudes on a continuum from Intellectualism to Pragmatism. Intellectualism was defined as pertaining to ideas and things of the mind, whereas Pragmatism was an interest in practical outcomes rather than in processes. These dichotomies were also qualified by the fact that intellectualism may be confounded with liberalism, and pragmatism with conservatism. Thus, an intellectual liberal is someone who believes that the purpose of education should be enrichment, has an interest in abstract and general culture, and reflects open-mindedness toward many issues. In contrast, a pragmatic-conservative believes that the purpose of higher education is to develop useful skills, is interested in concrete rather than abstract ideas, has little interest in music, art, and other aspects of general culture, and displays a close-minded attitude.

Yuker and Block's (1964) measure was significantly correlated with longer college attendance, such that those who had been in college longer were more likely to report intellectual-liberal attitudes. Students with a humanities major significantly scored higher when compared to business major students, possibly indicating a reflection of intellectual and pragmatic orientations of the respective fields. Support was added when Polmantier, Ferguson, and Burton (1970) reported that students enrolled in educational psychology, secondary education, guidance counselling, school administration, and elementary education were more intellectual in their orientation when compared to physical educational, and vocational and technical education students.

Yuker and Block (1964) reported that Grade Point Average (GPA), or college results, were moderately correlated with scores on the scale, such that evening students with higher reported intellectual-liberal attitudes were also more likely to be scoring higher on their GPA. Additional significant and positive relationships were found between the intellectual-liberal attitudes and verbal, as well as reading ability.

3.6.3 Anti-Intellectualism as a disposition

In contrast to the previous conceptualisation of anti-intellectualism as an attitude, recent research by Eigenberger and Sealander (2001) developed a scale measuring students' approach to intellectual abilities. The investigation was based on the work by Hofstadter (1963), and assumed that many of the anti-intellectual sentiments towards educational institutions in America that were present and influential during the formative years of the nation were still present in the modern day. Citing the lack of empirical investigations of anti-intellectualism in the scientific literature, Eigenberger and Sealander set out to examine and develop this concept as a discrete variable that can affect social, political, or personal decisions. Furthermore, and subsequently contentious in the numerous replies and rejoinders (Eigenberger, 2002a, 2002b; Howley, 2002; Joseph, 2002) elicited by this research, Eigenberger and Sealander somewhat rashly posited that anti-intellectualism should be conceptualised as a trait.

Anti-intellectualism was defined by Eigenberger and Sealander (2001) as a dispositional trait that indicated a preference towards "the life of the mind" (p.388). Ideas from Rigney's (1991) analysis of Hofstadter were used as the foundations for the development of an uni-dimensional scale, with particular emphasis on measuring sentiments relating to unreflective instrumentalism as well as those that echoed a general lack of interest in intellectual exploration. Items were related to personal preferences regarding the "content, pedagogy, and value of college courses, as well as orientations toward professors" (Eigenberger & Sealander, 2001, p. 388). These were developed as sentiments in the form of statements-of-preference which reflected either an anti-intellectual or pro-intellectual bias. A pro-intellectual bias was described as a "preference for general learning, employing theories, examining hypotheses, research, writing, and synthesising diverse sources of knowledge – activities typically associated with a traditional liberal arts curriculum" (Eigenberger & Sealander, 2001, p. 388). Anti-intellectual sentiments were considered to be the opposite of these, and consisted of activities not associated with the arts.

Notable results from the validation of Eigenberger and Sealander's (2001) devised Student Anti-Intellectualism Scale included a positive correlation with a Dogmatism and Authoritarianism scale aimed at measuring aspects such

as cognitive rigidity and uncritical acceptance of group norms. There was support that anti-intellectualism was negatively associated with deep and elaborative processing, but not with rote memorisation. Results from one of the studies also found a negative correlation between the Student Anti-Intellectualism Scale and the California Critical Thinking Skills Test, indicating that as anti-intellectualism levels rose there was a decrease in reported critical thinking behaviour. Further analyses also showed that the Student Anti-Intellectualism Scale was not related to the Social Desirability Scale. In addition, there was a strong correlation between the scale and the personality domain "openness to experience" from the Five Factor Model of personality (Costa & McCrae, 1992). More specifically, a strong negative correlation between the Student Anti-Intellectualism Scale and the facet of Ideas termed intellectual openness, was interpreted as support for anti-intellectualism as a personality trait.

A contentious and provocative side of Eigenberger and Sealander's (2001) investigation into negative attitudes towards the life of the mind was the claim that anti-intellectualism was a heritable trait related to openness to experience. This claim initiated a series of critiques and replies. Howley (2002) denounced the idea of anti-intellectualism as a heritable trait related to the domain of "openness to experience". Rather, anti-intellectualism was proposed to be a cultural predisposition propagated from a certain cultural ethos that leads students to value intellectual pursuits to a lesser degree. This rejoinder by Howley prompted Eigenberger's (2002a) reply where caution was given to the premature claims of anti-intellectualism as a personality trait. A further critique of Eigenberger and Sealander's paper on anti-intellectualism was delivered by Joseph (2002), who noted how there is no basis to believe the claim that personality differences are strongly influenced by genetics. Eigenberger (2002b) defended any claims against intellectual openness as a biological trait that raised a racist agenda. In addition, Eigenberger conceded that although the small sample from his study (Eigenberger & Sealander, 2001) was not sufficient to infer a construct overlap between openness and anti-intellectualism, the absence of any other studies using the Student Anti Intellectualism Scale or similar measure of anti-intellectualism made the connection harder to argue. Despite these criticisms, an additional research investigation has been conducted using the Student Anti Intellectualism Scale. Hook (2004) applied the scale to

investigate the relationship between students' anti-intellectualism and adjustment to college as identified by Baker and Siryk (1984).

Whilst the responses to Eigenberger and Sealander's (2001) interpretations of the results were valid in criticism of the somewhat rash judgements relating to the reasons for anti-intellectualism, the research did provide a worthy initial investigation of a neglected topic in the social sciences. The scale utilised Rigney's (1991) analysis of Hofstadter's (1963) seminal accounts of anti-intellectualism quite effectively, with items devised to measure unreflective instrumentalism. Furthermore the results supported construct validity, thus indicating that the measure of anti-intellectualism was related to similar theoretical constructs. However, there is a point of demarcation that must be made about the Student Anti-Intellectualism Scale's intent of measuring anti-intellectualism. According to the OED, the prefix *anti* denotes against or opposed to, whilst *non* simply refers to not (Simpson & Weiner, 1989). It is argued that Eigenberger and Sealander's uni-dimensional scale of anti-intellectualism is actually a scale that measures non-intellectualism. The scale measures sentiments reflecting a general lack of interest in intellectual exploration, something that is more akin to non-intellectualism rather than anti-intellectualism. Items that describe being bored by abstract thinking, or not being interested in philosophical discussions can hardly be labelled anti-intellectualism; certainly not analogous to the examples and definitions provided in the previous sections.

A further critique of Eigenberger and Sealander (2001) is the interpretation that the Student Anti-Intellectualism Scale translates to an underlying personality disposition. Anti-intellectualism is considered an "attitudinal construct – basically as a negative attitude toward what may be termed, the 'life of the mind'" (Eigenberger & Sealander, 2001, p. 388). So, in the words of the authors the scale measures an attitude towards intellectual preference or bias; it is in this form that the present research understands the Student Anti-Intellectualism Scale. As such, anti-intellectualism should not be thought of as a personality disposition, but rather an attitude tied in with norms associated with cultural movements surrounding political, social and religious, as well as economic ideas; much in the same way Hofstadter (1963) understood it.

3.7 Summary of research into Anti-Intellectualism

Whilst there has been very little literature on anti-intellectualism in the specific area of psychology and more broadly in the social sciences, exploration of this phenomenon is important in understanding the current attitudes towards scientists and perhaps other intellectual high achievers. The construct of anti-intellectualism is a rather difficult one to define, or at least find agreement on its definition. The majority of theorising as to what constitutes anti-intellectualism was provided by the works of Hofstadter (1963), with a subsequent re-conceptualisation and analysis by Rigney (1991). The target of anti-intellectualism is not only the intellectual, but also the ideas of the intellectual. Intellectualism is as Hofstadter noted, different from intelligence, and resides opposite those mental technicians or pragmatists. The intellect does more than just evaluate an idea, it "examines, ponders, wonders, theorizes, criticizes, imagines" (Hofstadter, 1963, p. 25); it evaluates the evaluations. It is also important to differentiate this from non-intellectualism, which is analogous to an indifference to the life of the mind. As such, anti-intellectualism is defined as disapproval or hostility towards ideas that may be critical or creative, and towards those persons who harbour or communicate these ideas (i.e., a negative attitude).

Another distinction that must be made is that this thesis views anti-intellectualism is an attitude, and not a personality disposition as claimed by Eigenberger and Sealander (2001). The account by Hofstadter (1963), as well as that of Rigney (1991), in addition to the numerous descriptions in the previous sections on anti-intellectualism in politics (e.g., Bishop, 1976; Dreher, 1962; Leuchtenburg, 1955), social life and religious life (e.g., Baker, 1986; Leuchtenburg, 1955; Vail, 2001), business and economics (e.g., Gilbert, 1955; Leuchtenburg, 1955; Shaffer, 1977), strongly suggests that anti-intellectualism is an attitude tied in with the social norms and zeitgeist of the time. Whether it be the Scopes trial in the USA of the 1920s (Bishop, 1976), McCarthyism of the 1950s (McWilliams, 1955), or the present disdain for educational spending in Australia (Illing, 2007; Lewis, 2007; Maiden, 2007), anti-intellectualism can be identified time and time again in social, political, religious, and educational

spheres. This anti-intellectualism is perhaps best thought of as a reaction to an outside threat from intellectuals.

Scalmer (2005) presented a typology of different kinds of anti-intellectualism, situated on two axes: field of articulation (i.e., expressed or projected) and field-orientation (i.e., offensive or defensive). The expressed types if anti-intellectualism noted by Scalmer, labelled Threat and Limit, are the ones that will be addressed in the current thesis. Specifically Threat, when non-intellectual values are asserted within an intellectual field, is particularly relevant to the critique of scientists working in new and emerging technologies.

The following chapter will aim to locate this anti-intellectualism in a setting of science, and more specifically the perceptions of scientists. The rationale for this is that the perceptions and reactions towards scientists may be related to anti-intellectualism, and more specifically to the threat and limit fields (Scalmer, 2005).

CHAPTER 4

PERCEPTIONS OF SCIENCE AND SCIENTISTS: THEORY AND RESEARCH

"When the fear of science is paramount… the evil has no attribution beyond that of the perverse will of an individual scientist" (Sontag, 1966, p. 223)

4.1 Overview of the Chapter

Literature looking at the perceptions or attitudes towards scientists is limited. Although perceptions of scientists can be linked with the perception of science, it is imperative to make a distinction between the attitudes towards the field versus attitudes towards those who are practitioners in that field; the attitude target is markedly different. This chapter will review the attitudes towards science and more specifically scientists, with an aim to establish the lack of research into the latter. Furthermore, the review will focus on attitudes towards new and emerging technologies and how these may relate to anti-intellectualism and perceptions of tall poppies.

4.2 Perception of Science

Whilst research on the perception of scientists is scarce, recent studies have examined the relationship between knowledge of science and attitudes towards science – known as the public deficit model of science. According to Durant, Evans, and Thomas (1989) there are "important relationships between public understanding and public attitudes, with a tendency for better-informed respondents to have a more positive general attitude towards science and scientists" (p. 14). However, this must be qualified, as further research by Evans and Durant (1995) showed that knowledge correlates moderately and positively with general attitudes towards science and moderately and negatively with morally contentious research. Thus, the effects of knowledge on attitudes are quite different according to the issue or context. Evans and Durant also reported that religious belief is associated with opposition to morally controversial

research. This effect may in part be due to the links between age and religiosity, as a model that included both age and religiosity showed that age had a stronger effect on predicting attitudes towards controversial research. Still, one has to be careful to draw too many links with the present thesis, as Evans and Durant's research focused on attitudes towards science and not the practitioners of science: the scientists.

The 1960s saw a decline in the public approval for science and the scientist due largely to the alliance between science and the military (Morison, 1969). Paradoxically this was not long after the scientist had helped win the Second World War. It appeared this new union between science and technology was producing an uneasy balance of terror (Morison, 1969). Similarly, science at the present time faces new criticisms from its involvement in research into the applications of new technologies such as crop genetic engineering (e.g., Gilding & Critchley, 2003) and stem cell research (e.g., Nisbet, 2004). In a paper examining the public perception of science and the associated issues for the scientist, Boulter (1999) argued that until recently science was viewed as infallible, and thus reactions to applications that have not been beneficial have been strong. Boulter's view is that scientists are viewed as arrogant by the public when some scientists have conveyed an "omnipotent view of science by stressing mechanical models of the universe, reductionism, and more recently the search for 'reductive theories of everything' " (p. 5). More recently, these claims have shifted to tampering with nature; claims that scientists are being disrespectful and lacking in care through perceived attempts at altering or controlling nature (Boulter, 1999).

Recent research of public perception of emerging technologies in Australia has asked the general public about their level of comfort and trust in specific scientific applications. Whilst Gilding and Critchley (2003) found there was optimism in relation to science and technology (e.g., science and technology can solve most problems faced by human beings), Australians were not generally comfortable with biological engineering technologies such as genetically engineered plants for food. Interestingly, they were somewhat comfortable with stem cell research using adult tissue, but polarised about stem cell research using left over IVF embryos. Subsequent research by Critchley and Turney (2004) focused on attitudes towards stem cell research and found that whilst most

Australians were comfortable with stem cell research using adult cells, they were not comfortable with research using cloned cells, and somewhat polarised on the use of left over IVF embryos for stem cell research. Additional results suggested that religious individuals were less likely to support stem cell research due to stronger anti-intellectual beliefs (e.g., Scientists have too much control over nature).

Further research by Critchley (2008) investigated the role of context and trust in the perception of stem cell scientists. Whilst some (e.g., Eramian, 2002) believe that the stem cell debate is simply the extension of the religion versus science debate (i.e., that opposition to stem cell research is primarily a function of religious beliefs), Critchley found that the context of the research and who conducts the research is important in understanding attitudes towards stem cell research. Furthermore, Critchley argued that when gauging attitudes about a complex activity such as stem cell research persons will rely on heuristics rather than knowledge about science, and thus may evaluate the trust in those who have the responsibility for conducting and regulating the research. This was based on research by Siegrist and colleagues (Siegrist, 2000; Siegrist & Cvetkovich, 2000; Siegrist, Cvetkovich, & Roth, 2000) who suggested that support for new technology was strongly associated with trusting and relying on those with the responsibility of carrying out the research.

The results from Critchley's (2008) study showed that persons who believed that scientists were benevolent were also more likely to trust scientists, view them as more competent, and slightly less self-interested when compared to scientists who were seen to be less benevolent. Furthermore, scientists working in a public university were seen to be more trustworthy, benevolent, and less self-interested when compared to those working in private institutions, or the control situation where no context was specified. These findings by Critchley suggest that attitudes towards practitioners in new technologies are important determinants in the perceptions of new technology, especially where an understanding of that new technology may be complex and persons rely on heuristics to inform their attitudes. In the case where people rely on heuristics to inform their attitudes towards a target, this is a form of non-intellectualism in the manner that there is a lack of critique, intellectual curiosity or exploration, or questioning to understand new technology.

4.3 Perception of Scientists

Perhaps one of the earliest investigations into the image of the scientist by high school students was carried out in the 1950s by Mean and Métraux (1957). The research was carried out in response to money and time being invested in promoting science as a career for students without there being information on attitudes towards science or scientists in the United States of America. The results from the qualitative questionnaire suggested that the

> scientist is seen as being essential to our national life and to the world; he is a great, brilliant, dedicated human being, with powers far beyond those of ordinary men, whose patient researches without regard to money or fame lead to medical cures, provide for technical progress, and protect us from attack (Mead & Métraux, 1957, p. 387).

However, this view of the scientist was also balanced with the negative view that the scientist is a dull and socially aloof person who does not spend time with his family. Beardslee and O'Dowd (1961) continued where Mead and Métraux left off, by looking at the perceptions of scientists by college students.

Beardslee and O'Dowd (1961) followed up the work of Mead and Métraux (1957) by asking college students standardised questions about 15 occupations, including scientists, in the form of semantic differential attribute characteristics. Results suggested that the scientist was seen as a highly intelligent person devoted to his work at the expense of friends and family. He was also seen as a person of status within the community, deriving personal pleasure from success, and thought of as motivated by selflessness. Furthermore, it was found that the scientist was thought of as an intellectual, but different from the "eggheads" in the humanities due to being directed in the use of his intelligence. Further analyses were conducted by Beardslee and O'Dowd to compare the image of the scientist with the other professions.

Scientists were seen to be similar with the college professor as well as the engineer, and surprisingly artists and school teachers (Beardslee & O'Dowd, 1961). The authors argued this relationship was due to an underlying intellectual role shared by all of these professions. Compared to the college professor, the scientist was not classified as a cultured intellectual as he relatively lacks artistic interest, good taste, and sensitivity. Furthermore, the scientist was not as socially

attractive or drawn to people when compared to the college professor. Finally, the scientist was thought of as less sociable and less popular when compared to the engineer. Additional findings by Beardslee and O'Dowd suggest that the scientist was also viewed more favourably by students who were enrolled to become scientists; these students rated the scientist as more interesting, more successful, more sensitive to art, and of a more sociable temperament when compared to students not planning to become scientists. A more detailed analysis of the perceptions of specialised scientists, such as chemists, biologists, and physicists, suggested that the scientist was seen less favourably; the scientist was characterised as less wealthy, less pleasant and outgoing when compared to the other specialised scientist (Beardslee & O'Dowd, 1961).

The research by Beardslee and O'Dowd (1961) supported the findings of Mean and Métraux (1957) using a college sample, confirming the stereotype of a scientist was a complex and differentiated one. The scientist was seen as very successful, being highly intelligent and motivated by the intellectual pursuit of knowledge. Conversely, they was seen as socially inept, and uninterested in people, but somewhat of a radical and nonconformist. Beardslee and O'Dowd commented that the "undesirable aspects of this picture of the personal and intellectual life of the scientist make the role hard to accept in spite of the attractiveness of the work and the social contributions of the scientist" (p. 30).

It is argued that the perceptions of scientists are related to the fear of the use of science to manipulate the material world. An examination of scientists in works of fiction (Weingart, Muhl, & Pansegrau, 2003) found that films and books often portray the researcher parallel with a threat to human health or nature due to their quest for new knowledge in secrecy, outside of the controls of academic institutions and peers. A reason the portrayal of scientists in the media is important is because according to Nisbet (2005), persons are cognitive misers and their public opinion on controversial issues related to science and technology (e.g., HESCR) is gained from value predispositions and readily available information from the mass media. Furthermore, Greenberg's Drench Hypothesis (Greenberg, 1988), which is based on Social Learning Theory (Bandura, 1977), suggests that favourite television characters can have a substantial impact on viewers and thus shape viewers' beliefs, attitudes, and expectations about a group (e.g., scientists working in HESCR) or a role (i.e., scientist).

Analyses of scientists in literary and film suggest that the scientist is generally portrayed as a white Caucasian, American, middle aged, male (Weingart, et al., 2003), and according to (Jones, 2001) is often characterised as either Heroic (e.g., objective, unemotional), Arrogant (e.g., objective, unemotional, detached from society), or Human (e.g., un-objective, too emotional, engaged with society). As such, scientists were either seen as too detached and unconcerned about the consequences of their work, or too emotional and insufficiently objective (Jones, 2001). In analysis of stereotypes of scientists in western literature, Haynes (2003) proposed seven primary archetypes: (i) the *evil alchemist*; (ii) the *noble scientist* as hero or saviour of society; (iii) the *foolish scientist*; (iv) the *inhuman researcher*; (v) the *scientist as adventurer*; (vi) the *mad, bad, dangerous scientist*; (vii) and the *helpless scientist* unable to control the outcome of his or her work.

In an analysis of the moral character of mad scientists, Toumey (1992) examined literature and movies (e.g., Mary Shelley's Frankenstein and Robert Louis Stevenson's Strange Case of Dr Jekyll and Mr Hyde) portraying the scientist and argued that the "evil of science is depicted and condemned principally in terms of the character of people who are scientists" (p. 415). These images portrayed by the media are influential in shaping the perceptions of the scientist, and these mad scientist stories are condemnations of rationalist science (Toumey, 1992). More recently, Boulter (1999) noted scientists are perceived as "being isolated, arrogant, obscure, starting things which later get out of control, tampering with nature and being unethical (blasphemous, uncaring and disrespectful)" (p. 1).

4.4 Summary of research examining perceptions of Science and Scientists

The literature reviewed in this chapter about public understanding and public attitudes towards science suggested that whilst knowledge about science was related to perceptions of science and scientists (Durant, et al., 1989; Evans & Durant, 1995), people are more likely to rely on heuristics when evaluating complex science such as stem cell research (e.g., Siegrist, 2000; Siegrist & Cvetkovich, 2000; Siegrist, et al., 2000). On the whole there is a lack of research looking at perceptions of scientists in general, and more specifically scientists

working in the field of emerging and complex technologies. Furthermore, the research presented in Section 4.3 suggested that scientists are generally considered to be intellectual. Thus, if the portrayal of scientists in film and literature is representative of real-life sentiments, then it is reasonable to predict that anti-intellectual values and beliefs shape the attitudes towards those persons working in areas of new technologies.

Whilst there has been no empirical research into intellectual tall poppies, research into the perception of scientists can provide an indirect link between moral character and attitudes. Previous research by Siegrist and colleagues (Siegrist, 2000; Siegrist & Cvetkovich, 2000; Siegrist, et al., 2000) suggested that support for new technology was strongly associated with trust in those carrying out the research (e.g., scientists in scientific organisations). Critchley (2008) argued that when gauging attitudes about a complex activity such as Human Embryonic Stem Cell Research (HESCR), persons will rely on trust heuristics rather than knowledge about science. Critchley found that persons who believed that scientists were benevolent were also more likely to trust scientists, view them as more competent, and slightly less self-interested when compared to scientists who were seen to be less benevolent. This suggested that perceptions of the moral character of science practitioners working in new technologies are important determinants of attitudes towards new technologies, especially where they are complex and persons rely on heuristics to inform their attitudes. In such circumstances, people may simply evaluate the trust in those who have the responsibility for conducting and regulating the research. Thus, judgements of moral and personal character of intellectuals could be understood as attitudes towards intellectuals, especially when they are involved in complex and morally questionable emerging technologies.

As pointed out by Rigney (1991), and applied by Eigenberger and Sealander (2001), unreflective instrumentalism (i.e., placing value on practicality and expedience, whilst diminishing the value of introspection and critical thinking) is the more common anti-intellectual strain present day society. Furthermore, if it is the case that people use the scientist as a proxy or heuristic to evaluate new and emerging scientific technologies (Critchley, 2008), then anti-intellectual beliefs and values towards science could influence the perception of the persons in charge of conducting this research. Hofstadter (1963) would argue

that scientists can be seen as intellectuals if they are pushing the boundaries of science, and not just pragmatic mental technicians. So those working in controversial areas not restricted by traditional boundaries of science (e.g., HESCR) are intellectuals. This conceptualisation of the scientist as an intellectual, leads to the possibility that there could be determinants of attitudes towards scientists outside those related to the perception of tall poppies.

CHAPTER 5

INTEGRATION OF THE LITERATURE AND THE DEVELOPMENT OF HYPOTHESES

5.1 Overview of the chapter

The purpose of this chapter is to integrate the theories and empirical works from the previous review chapters, and to present the aims and hypotheses of the present research. The following sections in Chapter 5 begin by outlining and defining how attitudes have been conceptualised in previous Tall Poppy research as well as how they will be conceptualised in the present study. Following on, section 5.3 will present how a functional perspective of Values relates to the present research, and how previous research into anti-intellectual attitudes can be conceptualised as a product of these value structures. Section 5.4 will discuss the effects of context on attitudes towards intellectual tall poppies (e.g., scientists). Finally, this chapter will present the aims and hypotheses, and provide the assumptions for this thesis.

5.2 Attitudes, personality characteristics, deservingness, and Tall Poppies

At a recent symposium it was argued that Australian culture shuns tall poppies, with the exception of sportspersons, due to their level of elitism (Murray, Dutton, & Fox, 2007). This suggested that in addition to sportspersons, elites or high achievers were also considered tall poppies. The present research aims to extend the current understanding of the tall poppy syndrome (e.g., Feather, 1994a) by measuring the perceived personality characteristics of intellectual high achiever. That is, an evaluation of the moral or personality characteristics of a high achiever are a commensurate measure of attitudes towards that particular person. Furthermore, it is also argued that the evaluations of a target's moral or personality characteristics are indicative of a general attitude towards that person, and extend to the group to which they belong.

Research by Feather and colleagues (Feather, 1989a; Feather, et al., 1991) as well as Grove and Paccagnella (1995) into the tall poppy syndrome have given

empirical support to the strong relationship between attributions of moral or personality characteristics, and the attitudes towards that target. Whilst Feather (1989a) found that high achievers were generally perceived to possess more positive qualities (i.e., favourable personality characteristics) when compared to average achievers, the relationship between personality and attitudes was also dependent on other variables such as deservingness. For example, Feather and colleagues (Feather, 1989; Feather et al., 1991) have consistently found that good tall poppies (i.e., friendly, high integrity, and not self-centred) were rated higher on positive affect (i.e., participants were pleased about high achievers' success) and deservingness variables when compared to bad tall poppies who were viewed less deserving of their success and persons reported pleasure if they were to fall. This provides support for the role of deservingness and personality characteristics in the attitudes towards these high achievers, as observations of positively or negatively valued behaviours may in time lead to attributions of good or bad moral character (Feather, 1994a, 1996). In addition, Grove and Paccagnella found that positive evaluations of high achievers were closely tied in with the attribution of positive traits, and negative evaluations with the attribution of negative traits, suggesting that attitudes towards the high achiever and ratings of their moral or personality characteristics were closely linked.

5.3 Ego Defensive Values

Values are thought of as distinct from attitudes, beliefs, or needs, and can be conceptualised as higher-order evaluative standards. As such, values can be seen as determinants for preferences and attitudes (Olson & Zanna, 1993). For example, values have been show to predict attitudes toward abortion and nuclear weapons (Kristiansen & Zanna, 1988) and beliefs in a just world (Feather, 1991b). In particular, Feather has demonstrated the relationship between attitudes towards tall poppies and values. That is, those with higher tradition maintenance values, higher hedonism values, and lower achievement values supported the fall of a tall poppy, whilst those with higher achievement values, social power, stimulation, and restrictive conformity values were more likely to favour the reward of tall poppies (Feather, 1989a).

Influenced by the research of Katz (1960) and Smith, Bruner, and White (1956) into the functional aspect of attitudes, Rokeach (1973) suggested that "all of a person's values are conceived to maintain and enhance the master sentiment of self-regard – by helping a person adjust to reality, defend his ego against threat, and test reality" (p. 15). For example, given that authoritarians' attitudes tend to serve ego defensive function, it is plausible that those values they believe to be significant such as family and national security (Altemeyer, 1996), fulfil ego-defensive needs (Kristiansen & Zanna, 1994). Studies into the functional role of attitudes have found some support that reactions to AIDS victims serve an ego-defensive function (Leone & Wingate, 1991), and approval or disapproval of the lifting of a ban allowing gays in the military was related to the rejection or endorsement of ego-defensive reasons respectively (Wyman & Snyder, 1997). The value justification hypothesis (Eiser, 1987) also lends support for the claim that values may fulfil ego-defensive needs.

Developed from accentuation theory (Eiser & Van der Pligt, 1982), the value judgement hypothesis predicts that people with opposing attitudes toward an issue will call on different general values to rationalise or validate their attitudes. Studies have shown that there were shifts in values that people with different attitudes regarded as important on issues of abortion and nuclear weapons (Kristiansen & Zanna, 1988), and in the role of value priorities in the restoration of pay equity for wages (Dickinson, 1991). As such, people seem to accentuate the values that could be used to rationalise their attitudes. However, research by Kristiansen and Zanna (1991) caution that perception of the relevance of Rokeach's terminal values moderated the magnitude of the relation between values and attitudes, such that "people held more positive attitudes toward attitude objects that were perceived as more instrumental to attaining values, but only to the extent that these values were perceived as relevant to the attitude object" (Kristiansen & Zanna, 1994, p. 58).

5.3.1 Anti-Intellectualism and conservative values

The relationship between anti-intellectualism and particular values can be speculated from previous research by Eigenberger and Sealander (2001). Whilst Eigenberger and Sealander's scale measured a continuum from non-intellectual

to pro intellectual attitudes, the underlying premise was that anti-intellectualism (non-intellectualism) was a negative attitude towards the life of the mind; in particular sentiments of unreflective instrumentalism as well as those that echoed a general lack of interest in intellectual exploration. Results from Eigenberger and Sealander are re-interpreted herein to lend support for the relationship between intellectual attitudes and values.

Recall that Schwartz (1992, 1996) conceptualised a circular arrangement of values (see Figure 2.2), where dynamic relations amongst the higher order value types described a compatibility or incompatibility if simultaneously pursued. For example, the higher order values of stimulation and self direction (Openness to Change) are in opposition to security, conformity, and tradition values (Conservation). In this way, the values that make up stimulation (i.e., excitement, novelty, and challenge in life) and self direction (i.e., independent thought and action choosing, creating, exploring) reflect similarities to a pro-intellectual attitude. In contrast, the values that make up security (i.e., safety, harmony, and stability of society, of relationships, and of self), conformity (i.e., restraint of actions and impulses likely to upset or harm others and violate social expectations or norms), and tradition (i.e., respect, commitment, and acceptance of the customs and ideas that traditional culture or religion provide for the self) are in opposition to stimulation and self-direction values.

These conservative values are argued to relate to lack of interest in intellectual exploration given the focus on maintaining tradition, conforming, and not opposing the permanence of societal norms. Conformity and tradition values share the motivational goal of submission to external expectations, both toward persons with whom one is currently in an interaction with as well as authorities and past ideas, respectively (Schwartz & Huismans, 1995).

Conservative attitudes, or values, can also be conceptualised as an ego-defence. Wilson (1973) wrote that conservative attitudes allow one to simplify, order, control, and render both the internal and external world more secure. This is managed by imposing order upon

> inner needs and feelings by subjugating them to rigid and simplistic external codes of conduct (rules, laws, morals, duties, obligations, etc.), thus reducing conflict and averting the anxiety that would accompany

> awareness of the freedom to choose among alternative modes of action (Wilson, 1973, p. 264)

According to Feather (1979a) the defensive functions of conservative attitudes are similar to the authoritarian personality (Adorno, et al., 1950), given that personality dispositions of the authoritarian as described by Sanford (1973a) overlap with the descriptions by Wilson. Thus, the link between Conservatism with Dogmatism and Right-Wing Authoritarianism (RWA; Altemeyer, 1996) as employed in the research by Eigenberger and Sealander's (2001), is made with anti-intellectualism below.

Eigenberger and Sealander (2001) reported a significant and positive relationship between both Dogmatism and RWA (Altemeyer, 1996) and anti-intellectual attitudes, suggesting that anti-intellectual attitudes were related to cognitive rigidity and intolerance of ambiguity (Rokeach, 1954, 1960; Rouff, 1975), censorship and uncritical acceptance of group norms (Altemeyer, 1981, 1988, 1996; Raden, 1982). These ideas of censorship and uncritical acceptance of group norms, as well as cognitive rigidity and intolerance of ambiguity reflected in Dogmatism and RWA, seem to fit well with the needs reflected in Conservative values. That is, Schwartz's (1992, 1996) higher order value of Conservation, that is made up of Conformity, Tradition, and Security values, appears to overlap with the concepts measured by Eigenberger and Sealander.

Values and traits are both considered to be implicitly stable, long lasting and internally caused (Chaplin, John, & Goldberg, 1988). Results from Eigenberger and Sealander (2001) also showed a strong negative correlation between the Student Anti-Intellectualism Scale and the facet of Ideas (r = -.61 p < .001) from the personality domain "Openness to Experience" of the Five Factor Model of personality (Costa & McCrae, 1992). Research by Roccas, Sagiv, Schwartz, and Knafo (2002) found strong and significant relationships between Openness to Experience and self-direction and stimulation values; the ideas facet of Openness to Experience was also significantly and positively correlated with self-direction and stimulation values. If the personality facet of Ideas is taken as overlapping with the higher order value of Openness to Change (i.e., Stimulation and Self Direction), then it could be expected that Anti-intellectualism is negatively correlated with Ideas and perhaps Openness to

Experience. In addition, Schwartz's (1992, 1996) hierarchy of higher order value types describe an incompatibility if diametrically opposing values are pursued simultaneously. As such, the pursuit of Conservation values would be in direct opposition with Openness to Change values. This appears to be well represented in Eigenberger and Sealander's results where anti-intellectualism is negatively correlated with Openness to Experience and positively with the Dogmatism and RWA measures.

Returning back to the functional purpose of the relationship between conservative values and anti-intellectualism, it is argued that under certain circumstances expressed Conservation values could be an ego-defence against intellectual exploration and critical thinking. The circumstances are in effect, those whereby intellectuals are perceived negatively by those with conservative values to be blocking or threatening these values of security, tradition, and conformity, through indirect or direct expressions made by the intellectual. For example, a person might have a negative attitude towards an intellectual when the intellectual's work or expressed viewpoints oppose or threaten their own values for a stable society, social norms or expectations, and traditional values. The current research argues that the influence on anti-intellectual attitudes comes about from contextual information and characteristics attributed to the target. So it may be that anti-intellectual attitudes may predict attitudes towards intellectual tall poppies, beyond that accounted for by perceived level of deservingness.

5.4 Contextual and individual effects on attitudes

The role of context was generally left unexplored in Feather and colleagues' research program into the predictors of attitudes towards tall poppies. However, two studies by Feather and colleagues (Feather & McKee, 1992; Feather, et al., 1991) briefly examined context, finding differences between the types of high achievers based on this factor. In particular, Feather et al. reported that sportspersons and some entertainers were rated more favourably when compared to the other groups such as politicians, and Feather and McKee reported that a golfer was envied more when compared to a student. The latter result was interpreted as support for social comparison theory (e.g., Erber & Tesser, 1994; Salovey & Rodin, 1984; Salovey, Suls, & Wills, 1991; Tesser, 2003; Tesser,

Suls, & Wills, 1991), given that the performance of the student was much more relevant for the student participants when compared to that of the golfer. The finding where sportspersons and some entertainers were rated more favourably than politicians and entertainers in general (Feather & McKee, 1992; Feather, et al., 1991) was understood in terms of deservingness. That is, those who were perceived to be more deserving of their success were also rated more favourably.

The present research is interested in extending on the idea of context as an influential determinant on the perception of tall poppies, particularly intellectual tall poppies. Recent research by Critchley (2008) showed that scientists working in a public university were seen to be more trustworthy, benevolent, and less self-interested when compared to those working in private institutions, or a control situation where no context was specified. This suggests that established stereotypes or norms about particular environmental contexts can influence the perception of a target such as the scientist. Thus, contextual information may indeed be impacting on the perception of an individual tall poppy working in that context. Similarly, the characteristics given about an individual within that context should influence the judgement of that person.

Chapter 2.3.4 described the relationship between the moral character of a tall poppy and the favourability expressed towards them, both in terms of judgements of deservingness and wanting to see them rewarded (Feather, 1989; Feather et al., 1991; Grove & Paccagnella, 1995). Whilst it can be argued that deservingness moderates the relationship between context and attitudes towards tall poppies, there was perhaps another individual level predictor that explained attitudes towards intellectual high achievers. That is, the perception of intellectual high achievers (e.g., scientists, academics, writers, poets) could rely on an evaluative judgement related to intellectualism. Also, recent research (Critchley, 2008; Siegrist, 2000; Siegrist & Cvetkovich, 2000; Siegrist, et al., 2000) suggests that support for new technologies that are complex are associated with judgements of those carrying out the research. If it is the case that people use the scientist as a proxy or heuristic to evaluate new and emerging scientific technologies (Critchley, 2008), then anti-intellectual attitudes and values towards science could influence the perception of the persons in charge of administrating this research. For example, when forming attitudes towards a complex area such as HESCR, the perceptions of the science will be heavily influenced by

evaluations of trust , benevolence and other personal or moral attributes about the scientists working in that field.

5.4.1 Threat, limit, and conservative values

Two of the varieties from Scalmer's (2005) typology of anti-intellectualism relevant to the perception of science and scientists are expressed, namely Threat and Limit. Anti-intellectualism Threat occurs when non-intellectual values are asserted within the intellectual field, whilst Anti-intellectual Limit happens when values are asserted outside the intellectual field in response to intellectual incursions. For example, Threat may occur when there are negative attitudes about genetic research or attempts at censorship, which could reflect values of conservatism. Limit might be exemplified in a case where criticism of expertise is used defensively, such as an outcry against scientific research that *meddles* with nature. Threat and Limit are seen as Offensive and Defensive incursions and reactions in response to an outside field, respectively.

Anti-Intellectualism Threat could be the result of an opposition to conservative values, an ego-defence that results in an assertion of non-intellectual values against intellectual values. For example, negative attitudes towards controversial emerging technologies such as HESCR could be an ego-defensive expression against a technology or process which opposes and threatens conservative values. As such, individuals with conservative values that feel threatened or questioned by such technologies may react and express anti-intellectual sentiments in order to rationalise or validate their attitudes. Critchley and Turney (2004) found that decreased trust in HESCR was due to a belief that science has gone too far, and is too controlling over nature. Thus, although their research did not measure values per se, Critchley and Turney found that negative attitudes towards HESCR were related to anti-intellectual beliefs; that is, beliefs that uphold conservative ideals such as stability and order in society in preference of progress and change.

Conversely Anti-Intellectualism Limit can also be the reaction by those with conservative values, where there is a reaction from non-intellectuals when criticism is used defensively against intellectuals. For example, when persons are frightened of the progress or the implications of HESCR, they may express

negative sentiments in the form of anti-intellectual attitudes towards those who carry out this research. Thus, critique of intellectuals is an act by which to defend individuals' conservative values, which may be threatened by research into controversial emerging technologies such as HESCR. In contrast, it might be expected that research into something that was also an emerging technology, such as Nanotechnology but whose applications are not perceived as morally contentious (European Commission, 2005) and not as threatening to conservative values, would not result in the expression of anti-intellectual attitudes.

5.4.2 Pragmatic versus Intellectual high achievers

Attitudes towards tall poppies have been shown to be related to numerous individual level predictors such as Deservingness (Feather, 1992, 1993c; Feather et al., 1991), moral or personality characteristics (Feather, 1989a; Feather, 1993d), Authoritarianism (Feather, 1993c), Global Self-Esteem (Feather, 1989, 1993a, 1993b; Feather & McKee, 1993) and Perceived Level of Competence (Feather, 1991a). A possible predictor that has not been investigated is a person's level of intellectuality. Thus, a key aim of this research was to investigate whether intellectual tall poppies are different from the traditionally examined non-intellectual tall poppies. Hofstadter (1963) wrote that intelligent persons were not by default intellectuals. These individuals live off ideas rather than for them, have stock skills and can apply them, and are nothing more than intelligent problem solvers. Hofstadter labelled them *Mental Technicians*, and as such was drawing a divide between intelligence and intellectuality. An intelligent person in a particular role could be classified as either an intellectual or pragmatist. In contrast, the intellectual lives for ideas and creativity. If Hofstadter's dichotomy is accepted as valid, that an intelligent person can be either an intellectual or pragmatist, it would therefore suggest that tall poppies (i.e., scientists) can be described as either intellectuals or pragmatic in nature.

Research by Critchley (2008) as well as others (Siegrist, 2000; Siegrist & Cvetkovich, 2000; Siegrist, et al., 2000) suggest that the perception of whether or not scientists are engaged in complex or non-complex research influences the attitudes towards that research. Critchley found that scientists working in a public university were seen to be more favourable when compared to those

working in private institutions, or a control scenario where no context was specified. Thus, it is possible that attitudes towards scientists differ across intellectuality level based on moral and perceived personality characteristics. As such, intellectuality could well be a factor by which certain tall poppies are evaluated. Furthermore, it could be expected that a person's own level of intellectuality, could influence their perception of a tall poppy that is ascribed intellectual characteristics.

The research on predictors of tall poppy attitudes has found that individual level predictors such as global self-esteem (Feather, 1989a; Feather, 1993b, 1993c; Feather & McKee, 1993) and perceived level of competence (Feather, 1991a) can influence the attitude towards a high achiever. Individuals with high self-esteem and high perceived level of competence were argued to be more likely to identify with the tall poppy because the tall poppy was seen as closer to the self in relation to achievement status (Feather, 1994a). This was interpreted by Feather in light of Social Comparison Theory (e.g., Salovey & Rodin, 1984; Salovey, et al., 1991; Tesser, 1986; Tesser, et al., 1991). Similarly, one's level of intellectuality and attitudes towards intellectual activities, as well as personal values towards the higher order values types of Openness to Change (i.e., stimulation and self-direction), could influence the level of favourability towards targets that are seen to possess intellectual characteristics.

5.5 Assumptions

The present research was not without some assumptions that are inherent to the investigation and testing of factors that relate to the evaluation of intellectual high achievers. The foremost supposition is that beliefs about stereotypical attributes of a group of people lead to the evaluation of that person, and thus represent an attitude towards them. Research by Grove and Paccagnella (1995) as well as Feather and colleagues (Feather, 1989; Feather et al., 1991) into the tall poppy syndrome have provided empirical support for the strong relationship between attributions of moral or personality characteristics, and the attitudes towards that target. For example, it was assumed that the act of evaluating a scientist's moral character positively (e.g., benevolent, polite, high integrity) is an indication of a favourable or positive attitude towards the scientist, and the

type of science that is carried out. However, this was only assumed to be the case when no other information is provided about the scientist, and the evaluation was being made about the scientist as a classification of that group.

Another assumption of the present research related to the definition of tall poppy. The literature has varying accounts of a tall poppy relating to the evaluative neutrality and categorical aspects of the attitude target. Peeters (2003, 2004a, 2004b, 2004c) argued the term is primarily associated with a negative evaluation of a public figure, whilst in contrast Feather (1994a) has argued that the term tall poppy is distinctively neutral and synonymous with a person of status who is a high achiever. Furthermore, Feather has by all accounts only researched tall poppies that could be classified as non-intellectual. Consequently, one of the aims in the present research was to investigate attitudes towards tall poppies that could be seen as intellectual. The present research therefore argues that the tall poppies in this research are considered to be high achievers by the public.

Whilst some may argue that a lot of intellectual high achievers (e.g., academics, scientists) are not public figures, it would be hasty to discount the fact that recent Australian of the year winners have on average been intellectuals rather than non-intellectuals; academics such as Sir Gustav Nossal and Professor Ian Frazer, as well as scientists such as Tim Flannery and Fiona Wood have all been awarded Australian of the year ("Australian of the Year," 2009) in recent years. Furthermore, a recent and ongoing campaign was developed by the Australian Institute of Policy and Science to recognise intellectual excellence and to encourage younger Australians to follow in the footsteps of other Australian outstanding achievers through the development of a Tall Poppy award ("The Tall Poppy Campaign," 2009). The award that recognises the achievements of outstanding young researchers in the sciences including physical, biomedical, applied sciences, engineering and technology, defines the Tall Poppy as a "metaphor for excellence and endeavour… [symbolising] Australia's pride in outstanding achievers in all fields" ("The Tall Poppy Campaign," 2009). Thus, it was argued that in this research the term tall poppy is a reflection of a publicly acknowledged high achievement.

As the present research was also interested in how anti-intellectual beliefs impacted on the evaluation of differing targets on the attribute of intellectualism,

an assumption was made regarding social comparison processes given that it was not measured. That is, it was expected that a person's anti-intellectual beliefs, or attitude towards intellectual activities, were related to their attitudes towards others who were similarly characterised or stereotyped by their level of intellectuality. Research by Feather (1991a) suggested that individuals with high self-esteem and high perceived level of competence may be more likely to identify with the tall poppy because the tall poppy is seen as closer to the self in relation to achievement status. Similarly, it was assumed that attitudes towards intellectual high achievers were in some way a reflection of the perceiver's own preferences or attitudes towards intellectual activities, and should relate to underlying value structures. For example, a person who values critical thinking and creativity is expected to be more positive towards a target that is described as intellectual or stereotypical of intellectuals, perhaps because they might categorise themselves more as belonging to the intellectual high achiever group and therefore express more favourable attitudes for the in-group member.

The current research also aimed to investigate the role of personal values (i.e., Openness versus Conservation values) in the evaluation of intellectual high achievers (i.e., scientists), with particular emphasis on how contextual information provided about the type of science being carried out (i.e., morally controversial versus normal science) would influence attitudes towards these tall poppies. In section 5.4.1 the relationship between Conservation values and a scenario relating to a controversial emerging technology HESCR was discussed. Thus, it was assumed that differences in attitudes towards scientists working in emerging technologies were due to an ego-defensive response to morally controversial research, which could be accounted by individual differences in Conservation values.

5.6 Aims and Hypotheses

This thesis is an extension of the work carried out by Feather and colleagues on the Tall Poppy phenomenon, which focussed on attitudes towards non-intellectual high achievers. The present investigation will explore whether intellectuals are considered tall poppies, and if the existing empirical research into factors that influence the perception of tall poppies is also applicable to the

perception of intellectual high achievers. For example, if we assume that an academic is an intellectual whereas a football player is a non-intellectual, it is likely that attitudes towards both of these high achievers will rely on evaluations of different criteria despite the possibility that both are tall poppies. Thus, a criterion that could influence attitudes towards intellectual high achievers would be the level of intellectuality of the target, which is an extension to the extant research on the predictors of attitudes towards tall poppies.

This leads to the pertinent question, under what circumstances will intellectual tall poppies be viewed negatively? If all tall poppies are part of the same *genus*, then generalised attitudes towards tall poppies should be indicative of both intellectual and non-intellectual tall poppies. As such, an aim of the present research is to investigate under what circumstances persons will view an intellectual or non-intellectual tall poppy in a positive or negative light. The research of Feather and colleagues presented in Chapter 2 provides the foundation and impetus for the present inquiry into what predictors or conditions influence evaluations of intellectual tall poppies. A negative attitude towards an intellectual tall poppy might be considered anti-intellectualism. From the seminal work by Hofstadter (1963), to Rigney's (1991) re-analysis of Hofstadter's anti-intellectualism, research in the area has been scarce. There are only a few attempts in the social sciences to understand anti-intellectualism (Eigenberger & Sealander, 2001; Scalmer, 2005; Yuker & Block, 1964). As such, one of the purposes of the present research is to add to this area, particularly focusing on the Australian context of intellectual tall poppies.

The present research will also focus on the impact of personal values and anti-intellectual attitudes on the perception of intellectual high achievers. As argued previously in 5.3.1, anti-intellectualism can be re-interpreted in terms of an opposition to higher order values whose motivational goals relate to Openness (i.e., stimulation and self-direction) as well as support for Conservation values whose motivational goals (i.e., tradition maintenance, conformity to established norms, and security of society) can be interpreted as an ego-defense against established conservative ideals (Feather, 1979a; Wilson, 1973). As such, a further aim of the present study is to investigate how personal values influence judgements of intellectual high achievers, directly and indirectly through their effect on attitudes towards intellectual activities. Furthermore, since values have

been shown to be related with education (Kohn & Schooler, 1983; Rokeach, 1973), age (Prince-Gibson & Schwartz, 1998; Schwartz, 1992), and religiosity (Roccas & Schwartz, 1997; Saroglou, et al., 2004; Schwartz, 1996; Schwartz & Huismans, 1995), the present research will take into account these demographic factors in interpreting the impact of values on attitudes towards tall poppies.

Another aim of the present research is to investigate how context (i.e., the type of research carried out by science) influences the perception of high achievers. Limited research by Feather and colleagues has examined contextual differences in the perception of tall poppies (Feather & McKee, 1992; Feather et al., 1991). However, this was interpreted in terms of social comparison theory (e.g., Roccas & Schwartz, 1997; Salovey & Rodin, 1984; Schwartz, 1992; Schwartz & Huismans, 1995) and level of deservingness. Research discussed in Chapter 4.2 by Critchley (2008) and others (Siegrist, 2000; Siegrist & Cvetkovich, 2000; Siegrist, et al., 2000) highlighted how persons use a heuristic about scientists when evaluating complex emerging technologies. It is expected that negative evaluations of scientists working in complex controversial research that opposes specific personal values, such as conservative values opposed by HESCR, might be influenced by anti-intellectual attitudes and conservative values in the form of an ego-defensive attitude response towards the scientists. In addition to explanations surrounding deservingness in the perception of tall poppies (e.g., Feather, 1999b), evaluations of a scientist should also be influenced by whether the scientist is described as intellectual or pragmatic, especially for persons who give importance to personal values relating to Openness to Change. This would especially be the case for research into HESCR, given that anti-intellectual attitudes and pro-conservative values have been previously found to result in more negative attitudes towards HESCR, and by extension the scientists working in HESCR (Critchley & Turney, 2004).

The final aim of the present research is to examine attitudes towards intellectual tall poppies, particularly towards those working in emerging technologies. As such, it will investigate the role of personal values such as Openness to Change and Conservation, attitudes towards intellectual activities, established measures of deservingness and attitudes towards tall poppies, contextual differences, as well as differences in levels of intellectuality in

scientists in order to understand their level of influence in the evaluation of intellectual tall poppies.

The present thesis is divided into three studies that examine, i) whether intellectuals are perceived as tall poppies; ii) the role of deservingness and attitudes towards tall poppies in the prediction of attitudes towards intellectuals and non-intellectuals; iii) whether attitudes towards scientists are a function of a general attitude towards tall poppies; iv) how conservative personal values as well as attitudes towards intellectual activities predict attitudes towards scientists; v) how personal values and attitudes towards intellectual activities influence attitudes towards scientists based on level of intellectuality (i.e., pragmatic or intellectual) in the perceiver as well as the target; and, vi) how the context (threatening or non-threatening to conservative values) influences the perception of tall poppies.

Study 1 investigated whether attitudes towards intellectuals are related to the tall poppy syndrome, and how they differ from attitudes towards non-intellectual tall poppies. Firstly, a pilot study was conducted as part of Study 1 to establish if intellectual high achievers are indeed considered tall poppies, or whether they are distinct from this traditional *genus* that investigated non-intellectuals. It was expected that the groups presumed to be intellectuals (i.e., academics, scientists, poets, writers) would be rated as more intellectual than the presumed non-intellectual group (i.e., politicians, pop stars, tv celebrities, sportspersons). Furthermore, it was hypothesised that all of the intellectuals and non intellectuals would attract similarly high tall poppy ratings, given that all can be classified as high achievers.

Study 1 also examined attitudes towards different types of intellectual and non-intellectual high achievers and how predictors of general attitudes towards tall poppies and level of deservingness influence attitudes towards these different groups. It was expected that intellectual high achievers would be seen as distinctive from non-intellectual high achievers (traditional tall poppies), and that this difference would be a function of the perceived level of deservingness that is attributed to each high achiever. That is, intellectuality will interact with deservingness to predict attitudes towards high achievers; specifically, intellectual high achievers who are rated high on deservingness will be evaluated more positively when compared with non-intellectual high achievers who are

rated low on deservingness. In other words, intellectuals should be perceived as more deserving when compared to non-intellectuals and this difference will contribute to intellectual high achievers being rated more favourably when compared to non-intellectual high achievers. Thus, it was hypothesised that in general, intellectual high achievers (e.g., academics, scientists, writers) will be seen to be less as tall poppies, and more deserving of their success when compared to non-intellectual high achievers (e.g., politicians, sportspersons, tv celebrities).

Study 2 investigated how attitudes towards intellectual activities stem from personal values relating to Conservation, and whether these beliefs against the pursuit of intellectual activities predict attitudes towards scientists. It also examined how general attitudes towards tall poppies predict attitudes towards scientists. It was expected that personal values relating to Conservation will negatively predict attitudes towards intellectual activities, and these in turn will influence the evaluation of the scientist such that those with stronger conservative values and more negative attitudes towards intellectual activities will be less favourable towards the scientist. Furthermore, if the scientist is perceived to be a tall poppy, then it could be expected that general favourable attitudes towards tall poppies should predict positive attitudes towards scientists, given that a scientist should be seen to be deserving of his or her achievement. The model that was tested is presented below in Figure 5.1.

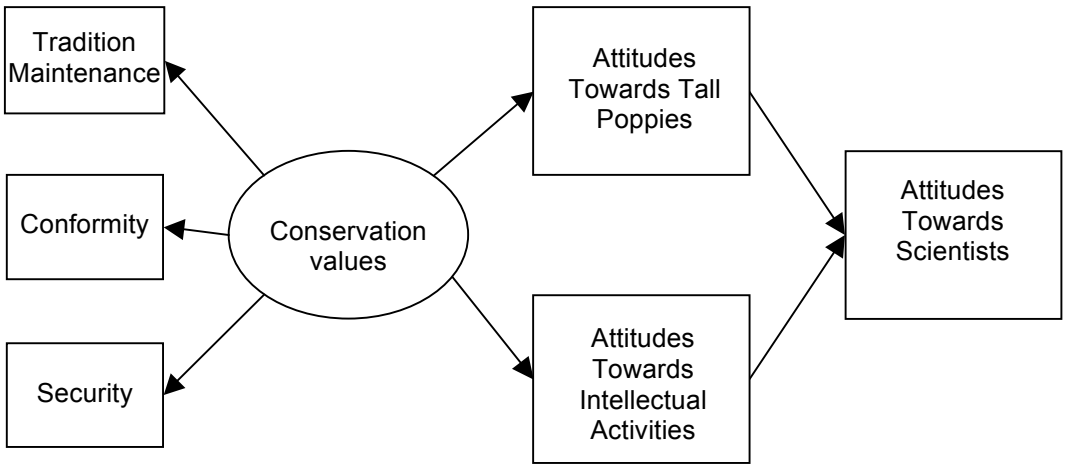

Figure 5.1. Theoretical model predicting attitudes towards scientists.

Study 3 investigated the effect of context and level of intellectuality on the perception of scientists, as a function of personal values and attitudes towards intellectual activities. Generally, it was expected that there be a difference in attitude ratings across context, as well as intellectuality type. Given that attitudes towards controversial emerging technologies, such as HESCR, should elicit a negative attitude towards practitioners of that science, it was hypothesised that attitudes towards scientists working in Nanotechnology will be more favourable when compared to scientists working in HESCR. Furthermore, this difference will be accentuated for individuals whose importance ratings on Conservation values are high attitudes towards scientists working in HESCR will be more negative, when compared with those whose importance ratings on Conservation values are low. That is, conservation values will interact with type of science to predict attitudes towards scientists; specifically, participants higher on Conservation values will be less positive to scientists who work in HESCR when compared with participants lower on Conservation values.

Finally, In line with theories of deservingness (e.g., Feather, 1999b), social comparison processes (e.g., Erber & Tesser, 1994; Salovey & Rodin, 1984; Salovey, Suls, & Wills, 1991; Tesser, 2003; Tesser, Suls, & Wills, 1991), and similar to the interpretation of findings where tall poppies were evaluated more favourably when they were similar to the perceiver in terms of group membership (Feather & McKee, 1992), it was hypothesised that attitudes towards scientists who are described as intellectual will be more favourable when compared to attitudes towards scientists described as pragmatic. Again, this difference was predicted to be accentuated when individuals reported more negative attitudes towards intellectual activities or lower importance ratings on personal values relating to Conservation. That is, the intellectuality of the scientist will interact with conservation values and/or a person's need for intellectual curiosity to predict attitudes towards scientists; in particular, participants higher on Conservation values or lower on need for intellectual curiosity will be less positive to scientists who are characterised as Intellectuals when compared with participants lower on Conservation values and/or higher on intellectual curiosity.

CHAPTER 6

STUDY ONE: ARE INTELLECTUALS TALL POPPIES ?

6.1 Overview of the Chapter and Introduction

The aim of the pilot study and first experiment of this thesis was to establish whether different categories of high achievers were seen as tall poppies, and whether attitudes towards both intellectual and non-intellectual high achievers were a function of general attitudes towards tall poppies and deservingness. The pilot study used a small community sample to explore what categories of high achievers could be viewed as either intellectual or non-intellectuals, and whether they were perceived as tall poppies. The concept of intellectual and non-intellectual was derived from the work of Hofstadter (1963), who not only delineated between intellectuals and mental technicians, but also characterised certain groups as being non-intellectual (e.g., businesspersons).

The first study builds on the pilot study, and seeks to understand how attitudes towards tall poppies differ based on their *genus*. That is, does an established measure of attitudes towards tall poppies suitably apply to all categories of high achievers, and does the perceived level of deservingness impact the evaluation of these high achievers. It is expected that intellectual high achievers will be rated more positively when compared to non-intellectual high achievers (i.e., traditional tall poppies). Furthermore, this difference in attitude rating will be a function of the perceived level of deservingness attributed to each high achiever. This was predicted in line with theories of attribution. That is, the stereotype for intellectuals is that achievement has been attained through deserved actions (e.g., hard work and effort), as opposed to the non-intellectuals where the stereotype is either ambiguous or where achievement or success has been the result of undeserved outcomes (e.g., opportunity or good luck).

It is further hypothesised that intellectual high achievers (e.g., academics, scientists, writers) will be rated less as tall poppies and more deserving of their success, when compared to non-intellectual high achievers (e.g., politicians, sportspersons, tv celebrities). Furthermore, it is argued that there will be an

interaction between attitudes towards tall poppies and intellectual type given the expected relationship between intellectuality and deservingness. That is, deservingness of obtaining one's present position should be positively related to the maintenance of a position for a tall poppy, especially for intellectual high achievers where the qualities of how they attained their position are more available and salient when compared to non-intellectual high achievers. Thus, it is expected that there will be an interaction between type of intellectual (i.e., intellectual or non-intellectual) and deservingness of achievement, and possibly an interaction between type of intellectual and attitudes towards tall poppies.

Finally, there was an exploratory hypothesis relating to how the established measure of attitudes towards tall poppies would predict and differentiate intellectual and non-intellectual high achievers. No direction was given, as it could be expected that an increase in beliefs about the favour fall of tall poppies would result in a decrease in favourable attitudes towards non-intellectual high achievers, yet there was no reason to believe that an increase in beliefs about the favour fall of tall poppies would result in an increase in favourable attitudes towards intellectual high achievers.

6.2 Pilot Study

Twenty-five participants, ranging in age from 21 to 52 years of age (M = 29.56, SD = 8.28) completed a short online questionnaire that was used as information gathering for this phase of the research. The aim of this pilot questionnaire was to gauge public perceptions and not objective classifications of tall poppies. That is, the pilot study sought to classify high achievers into intellectual or non-intellectual categories, and to examine if they were rated differently as tall poppies. It was hypothesised that in line with research on deservingness (Feather, 1999a), participants would rate Academics, Artists, Poets, Scientists, and Writers as more intellectual than Businesspersons, Politicians, Pop stars, Sportspersons, and TV Celebrities. This was expected given that intellectual tall poppies should be perceived to have achieved their success through internal causes (e.g., hard work and effort), whereas non-intellectual tall poppies should be perceived to have achieved success less through internal causes and more through external factors (e.g., opportunity or good luck). It was also

hypothesised that the high achievers would be more likely to be rated as tall poppies if they were also non-intellectuals. This prediction was based on the existing literature on tall poppies, which has in general always examined non-intellectual tall poppies and their falls (e.g., Feather, 1989a; Feather, 1993d). Furthermore, additional linguistic analyses of the term tall poppy (Peeters, 2003, 2004a, 2004b, 2004c) suggest its usage is predominately with non-intellectual high achievers.

All participants were asked two questions about these 10 types of high achievers. The questions were provided in the following order, "How intellectual do you think *X* are" and "How much of a 'Tall Poppy' do you think *X* are". No additional information was given in the form of definitions or examples of members from each group. Participants were asked to rate each group on a 7-point scale on the attributes of "intellectuality" and "tall poppiness", from 1 = Not at all to 7 = Very much. The results presented in Table 6.1, and are grouped theoretically as intellectual and non-intellectual as per previous writing (e.g., Hofstadter, 1963).

Table 6.1

Means, Standard Deviations, and Theoretical Ranges for Level of Tall Poppiness and Intellectuality

High Achiever type	Tall Poppiness[a]		Intellectuality[b]	
	M	*(SD)*	*M*	*(SD)*
Intellectuals				
Artists	3.26	(1.71)	4.92	(1.26)
Poets	2.83	(1.47)	5.04[h]	(1.40)
Writers	2.78	(1.41)	5.44[i]	(1.04)
Academics	3.43[c]	(1.78)	5.68	(1.15)
Scientists	3.13	(1.74)	5.92	(1.12)
Non-intellectuals				
Pop stars	4.78	(2.15)	2.64	(1.41)
Sportspersons	4.87	(1.98)	3.04	(1.40)
TV Celebrities	4.87	(1.94)	3.32[e]	(1.25)
Politicians	4.48	(1.88)	4.04[f]	(1.62)
Businesspersons	4.48[d]	(1.76)	4.84[g]	(0.99)

Notes: [a]$N = 23$, [b]$N = 25$

[c] significantly different from [d] ($F(1,22) = 7.76$, $p < .05$, $\eta^2 p = .26$), [e] significantly different from [f] ($F(1,24) = 4.78$, $p < .05$, $\eta^2 p = .17$), [f] significantly different from [g] ($F(1,24) = 14.77$, $p < .01$, $\eta^2 p = .38$), [h] significantly different from [i] ($F(1,24) = 5.33$, $p < .01$, $\eta^2 p = .18$).

Range from 1 Non-intellectual – 7 Intellectual; 1 Non-Tall Poppy – 7 Tall Poppy.

The results from Table 6.1 demonstrate the predicted trends across intellectual and non-intellectual high achievers. Two separate single factor within subjects MANOVAs with Tall Poppiness and Intellectuality as the dependent variables were carried out on all targets, with repeated levels contrasts to see where there were significant differences between high achievers across level of Intellectuality and Tall Poppiness. For each analysis, high achievers were ordered in ascending order of rating, such that planned contrasts could identify any significant breaks between scores. It was expected that there would be a delineation for high achievers on both Intellectuality and Tall Poppiness as per the theorised groupings.

The single factor within subjects MANOVA for level of Tall Poppiness found a significant difference in ratings across all high achievers (*Wilks* = .09, *F*

(9,198) = 13.66, $p < .01$, $\eta^2 p = .38$). Planned contrasts revealed only one significant difference between high achievers, and that was between the highest rated intellectuals on the Tall Poppy dimension Academics, and the lowest rated non-intellectuals on the Tall Poppy dimension Business persons ($F(1,22) = 7.76$, $p < .05$, $\eta^2 p = .26$). So as predicted, for Tall Poppiness there was a clear delineation between Intellectual and Non-Intellectual Tall Poppies given there were no significant differences between any of the high achievers within each theorised Intellectual or Non-intellectual group.

For Intellectuality, it was found that there was a significant difference in intellectuality rating across all high achievers (*Wilks* = .09, $F(9,216) = 39.95$, $p < .01$, $\eta^2 p = .63$). Planned contrasts showed that there was a significant difference between TV Celebrities and Politicians ($F(1,24) = 4.78$, $p < .05$, $\eta^2 p = .17$), Politicians and Business Persons ($F(1,24) = 14.77$, $p < .01$, $\eta^2 p = .38$), as well as between Poets and Writers ($F(1,24) = 5.33$, $p < .01$, $\eta^2 p = .18$). This result was somewhat more complex than expected, with several breaks between high achievers and less of a clear structure. However, the range of Intellectuality ratings were a lot larger when compared to Tall Poppiness and despite there not being a significant break between Business Persons and Artists ($F(1,24) = .19$, $p > .05$, $\eta^2 p = .01$) there was a trend for the high achievers to be grouped based on theorised Intellectuality rating.

Further analyses were conducted after grouping the high achievers in their respective theoretical group based on intellectuality. The paired samples t-test on ratings of 'tall poppiness" showed a significant difference in the group means ($t(24) = 10.67$, $p < .01$) between Intellectuals ($M = 5.40$, $SD = 1.02$) and Non-Intellectuals ($M = 3.58$, $SD = 1.03$), indicating that theorised members of the Intellectual category were rated more intellectual when compared to the theorised members of the non-intellectual category. Similarly, the paired samples t-test on ratings of 'tall poppiness" also showed a significant difference in the group means ($t(22) = 5.74$, $p < .01$) between Intellectuals ($M = 3.80$, $SD = 1.38$) and Non-Intellectuals ($M = 4.70$, $SD = 1.76$), indicating that theorised members of the Intellectual category were rated less on the dimension of Tall Poppiness when compared to the theorised members of the non-intellectual category.

As such, the hypotheses were supported given that respondents rated the five categories of high achievers as being more intellectual than the other five categories. From an empirical standpoint, Businesspersons was rated closer to the intellectual groupings than the non-intellectuals. According to previous research (e.g., Hofstadter, 1963), it was argued that a Businessperson be categorised as a non-intellectual, however these results did not find this. As such, the category of Businesspersons was excluded from any further analyses as it was ambiguous as to which group they belonged to.

The results from the pilot study were in the expected direction for ratings of high achievers, with intellectuals being evaluated less as tall poppies when compared with non-intellectuals. This supported the hypothesis that non-intellectuals are more likely to be perceived as tall poppies when compared to intellectuals. The underlying reasons for this trend were not examined here; however they are examined in subsequent studies in this thesis. A possible explanation based on research by Feather and colleagues (e.g., Feather, et al., 1991) may hinge on deservingness. That is, high achievers that are perceived to be deserving of their success through intrinsically attributed causes such as hard work or effort are more likely to be evaluated as intellectuals. Given that the term Tall Poppy can be used in a pejorative sense (e.g., Peeters, 2003), ratings may also reflect persons' evaluations of how deserving that group is of their high achiever status. However, it must be noted that in general Sportspersons could be seen as deserving of their success given the intrinsic attributions made about the reasons for their success (i.e., hard work and effort due to training). In turn, this may suggest that high achievers are being evaluated on more than one dimension.

Based on these findings, it was decided that only eight categories of high achievers from both the intellectual and non-intellectual group be retained for subsequent studies. Given that Businesspersons was ambiguous as a non-intellectual, and Artists was the lowest rated intellectual, these two high achievers were removed from subsequent analyses. The final four intellectual high achievers were Academics, Poets, Scientists, and Writers. The final four non-intellectual high achievers were Politicians, Pop Stars, Sportspersons, and TV Celebrities. Study 1 used these target groups to test the hypotheses regarding

the role of deservingness and attitudes towards tall poppies in the prediction of attitudes to intellectual and non-intellectual high achievers.

6.3 Study One

6.3.1 Method

6.3.1.1 Participants

Two hundred and eighty five participants (33 males, 143 females, 1 unspecified) from a university in Melbourne and a wider community sample (60 males, 48 females) voluntarily completed a questionnaire study. Respondents ranged from 17 to 66 years of age (M = 28.01 years, SD = 10.82 years). There were 174 participants from a university in Melbourne who completed the measures as partial credit for their first year undergraduate course in psychology. They were recruited from first year psychology classes, and the wider community sample was obtained through snowballing techniques. Out of the sample from the wider community, 42 reported being enrolled in study at the time of the questionnaire, such that 75.8% of the total sample was currently enrolled in some sort of educational program. As such, the participants were highly educated for the most part, with specific proportions presented in Table 6.2.

Table 6.2

Education Level of Sample

Education level	Frequency (percentage)
Primary	1 (0.4)
Some Secondary	2 (0.7)
Completed Secondary	80 (28.5)
Trade Qualification	4 (1.4)
TAFE or Diploma Level	26 (9.3)
Incomplete Tertiary	67 (23.8)
Complete Tertiary	61 (21.7)
Postgraduate	40 (14.2)

Note: N = 281.

Almost 70 percent of the sample reported either achieving or attempting a Tertiary degree (i.e., including TAFE or Diploma). The majority of participants indicated Australia as their place of birth (77.5%), with the remainder having lived in Australia between 2 and 50 years (*M* = 19.28 years, *SD* = 12.52 years). More precisely, the average time (i.e., number of years lived in Australia divided by age in years) spent living in Australia as reported by migrants was about 60% of their lives (*M* = 59.46%, *SD* = 29.49%). This was recorded as a possible covariate , which was not found to be significant, given that the tall poppy syndrome is almost exclusively an Australian phenomenon (Feather, 1989a).

6.3.1.2 Materials

6.3.1.2.1 Attitudes towards tall poppies scale

The Tall Poppy Scale (Feather, 1989a) was used to assess the general attitudes towards tall poppies. Participants are asked indicate their level of agreement with 20 statements about successful people on a 6-point scale: 3 = I agree very much; 2 = I agree on the whole; 1 = I agree a little; -1 = I disagree a little; -2 = I disagree on the whole; -3 = I disagree very much. Each item was rescored to obtain a positive scale that ranged from 1 – 6. The scale consists of 10 items that express positive attitudes towards tall poppies (e.g., People who are very successful deserve all the rewards they get for their achievement; Society needs a lot of very high achievers), and another 10 that express negative attitudes towards tall poppies (e.g., People who are "tall poppies" should be cut down to size; People who are very successful get too full of their own importance).

The TPS has been shown to demonstrate a consistent two factor model using exploratory and confirmatory factor analyses (Feather, 1994a). Commonly, the first factor is made up of 10 items that express negative attitudes towards tall poppies and favour their fall. The second factor is made up of the 10 items that express positive attitudes towards tall poppies and favour their reward. These two factors are each considered as subscales, the former known as Favour Fall and the latter Favour Reward. Each of these subscales has a score from 10 to 70. The Favour Reward items are reverse scored, then added with the Favour Fall items to represent favouring the fall and not rewarding the success of a tall

poppy. Internal reliabilities for Favour Fall and Favour Reward subscales have been reported as .85 and .80 respectively (Feather, 1989a). In the present study reliability was found to be acceptable, ranging between .75 and .80 for the Favour Reward and Favour Fall scales respectively. The total score on the 20 items range from 20 to 140, and the total scale internal reliability has found high (Feather, 1989a). Studies by Feather into the perception of tall poppies have often solely used the Favour Fall subscale due to its high internal reliability and overall correlation with the overall measure of general attitudes towards tall poppies (e.g., Feather, 1994a; 1996, 1999b). Thus, it was decided to use the Favour Fall subscale of the generalised Tall Poppy Scale to represent a negative attitude towards high achievers and persons of status.

Additionally, the relationship between these subscales and values from the Schwartz Value Survey (Schwartz, 1992) have shown that attitudes towards tall poppies are related to achievement and power values (Feather, 1989a). That is, those who favoured the fall of tall poppies assigned less importance to achievement (e.g., ambitious; successful) and power (e.g., social power; authority) values when compared to those who favoured the reward of tall poppies.

6.3.1.2.2 Attitudes towards high achievers scale

The semantic differential scale consists of a series of bipolar adjectives that are on a continuum (in this case, a 7-point scale). The concept was developed by Osgood, Suci, and Tannenbaum (1957) from a study into measuring the connotative meaning of concepts. From a large sample of cultures and numerous bipolar adjectives, Osgood et al. were able to factor analyse these into a smaller set of dimensions, which were labelled evaluation, potency, and activity (Eagly & Chaiken, 1993). The evaluative dimension explained the largest variance out of the ratings, and as such was deemed prototypical and best representative of attitude.

Reviews of attitude research that have used semantic differential measurement (Heise, 1970; Jackson, Markley, Zelhart, & Guydish, 1988; Payne, 1975) find that with a few bipolar scales, there is adequate reliability for most purposes (Eagly & Chaiken, 1993). In addition, Eagly and Chaiken report that

the evaluative scores from the semantic differential correlate highly with scores from other attitude scaling techniques (Breckler, 1984; Fishbein & Ajzen, 1974; Jaccard, Weber, & Lundmark, 1975; Osgood, et al., 1957). Claimed disadvantages of the use of semantic differential scales for attitude measures relate to the unknown measurement properties about the obtained attitude score (Eagly & Chaiken, 1993).

The attitudes towards high achievers scale measured one's attitudes towards a particular target group. Thirteen items were selected from the word-pairs used by Feather and colleagues in previous research into Tall Poppies (Feather, 1989a; Feather, 1993c, 1993d; Feather & McKee, 1992; Feather, et al., 1991). In these previous studies word pairs by which people could rate characteristics of tall poppies were found to consistently categorise into two components, often labelled as Integrity and Arrogance (α = .77-.83, Feather, 1993c, 1993d; α = .67-.71, Feather & McKee, 1992; α = .69, Feather, et al., 1991) or Good Mixer and Self-Centered (α = .77-.81, Feather, 1993c, 1993d; α = .81-.89, Feather & McKee, 1992; α = .89, Feather, et al., 1991). Participants were asked to rate these word pairs on a 7-point bipolar adjective scale as to how representative they are of each attitude target (e.g., Scientists, Sportspersons). For example, people were asked "I think Australian Poets are …" Unassuming / Arrogant. Items across attitude targets were re-ordered and counterbalanced to minimise responder bias and acquiescence.

6.3.1.2.3 Deservingness

Four items from Feather, Volkmer, and McKee's (1991) study into the perceptions of nine prominent public figures in politics, sport, and entertainment, measured how and why high achievers obtain their positions. Participants are asked to rate on a 7-point scale how important as a cause (1 = Not important at all as a cause; 7 = Extremely important as a cause) four word pair attributes were in the attainment of the high achiever's present position. The word pairs given were ability or talent, hard work or effort, outside or external assistance, and opportunity or luck. These descriptions were designed to assess different combinations of three causal dimensions that have been reliable in understanding attributions of achievement (Weiner, 1992).

The items on causal attribution were selected as they were determined to be a good representation of deservingness (e.g., Feather, 1999b). Internally attributed actions, such as *ability or hard work*, that led to the high-achievers' present position would be perceived as more deserving when compared to external attributes such as *external assistance or luck*. The reason the internally attributed actions were argued to be deserved was because these actions were more likely to be seen as positively valued behaviours that led to a positively valued outcome (i.e., high achievement). In the case of external attributes such as *external assistance or luck*, it was argued that these behaviours were seen to be undeserved, as the behaviours that led to the positively valued outcome were negatively valued (Feather, 1992). Previous research by Feather et al. (1991) found a very strong correlation between the deservingness of present position and ability ($r = .61$, $p<.001$), effort ($r = .64$, $p<.001$), and assistance ($r = -.21$, $p<.001$), and deservingness to maintain position with ability ($r = .54$, $p<.001$), effort ($r = .53$, $p<.001$), and assistance ($r = -.23$, $p<.001$).

6.3.1.3 Procedure

The data were collected using a paper and pen questionnaire or an online survey. Participants recruited from undergraduate classes in psychology from a Melbourne university were offered the opportunity to complete a short series of tests in a place of their convenience in exchange for partial course credit. Instructions were provided as how to return the completed questionnaire to a locked collection box on campus, or via post. Persons who completed the questions online were sampled via e-mail snowballing techniques requesting each recipient to pass on the hyperlink to the study on to as many people as possible.

Presentation of attitude targets was also counterbalanced across eight different surveys to control for possible ordering effects. As such participants were always presented with four targets to rate. Participants always rated two Intellectuals and two Non-Intellectuals in each questionnaire; however, the eight surveys used differing combinations of Intellectuals and Non-Intellectuals to control for any possible ordering effects that could arise based on rating a particular high achiever first or last. There were also different orders across both

online and paper and pen surveys to control for any effects of questionnaire type on responses. Two orders of the questionnaires used in Study 1 are presented in Appendix D1 and Appendix D2.

6.3.2 Results

Data were analysed using SPSS for Windows (version 14) and MlwiN (version 1.10.0007). In order to maximise the amount of available data, missing values were inserted using multivariate regression imputation in no more than 1.13% of the total cases. For example, missing values from the Attitudes Towards Tall Poppies Scale were regressed from existing values. Tabachnick and Fidel (Tabachnick & Fidell, 2007) recommend this method of data imputation where no more than 30% of values are missing from one scale. In addition, this form of regression imputation has also been found to be valid and reliable (Hawthorne & Elliott, 2005). Data screening revealed no univariate outliers, yet multivariate outliers were present. These cases were deleted from the sample, which enabled the data to satisfy the assumptions of linearity, normality, homoscedasticity, independence, and non-multicollinearity.

6.3.2.1 Manipulation check

A manipulation check was carried out to check if participants actually believed that the attitude targets were in fact tall poppies. Asked to think about the four groups of people that they had just rated, participants then marked each target as either Successful or Unsuccessful.

The manipulation check results presented in Table 6.3 show that all Intellectual high achievers were also consistently rated as successful. For Non-intellectuals, the percentages of rating the targets as successful were lower when compared to Intellectuals, except for sportspersons. However, with the exception of Politicians, the other Non-intellectuals were also consistently rated as successful, and Sportspersons were almost unanimously rated as successful. Thus, as a greater than 50% rating was deemed as adequate agreement, all examples were considered appropriate examples of tall poppies, given that Feather defines a tall poppy as a high achiever that is conspicuously successful viewed from a distance (Feather, 1994a).

Table 6.3

Percentages of Participants who rated High Achievers as Successful

Successful	Percentage
Intellectuals	
Academics[a]	90.7
Poets[b]	55.2
Scientists[c]	87.3
Writers[d]	74.3
Non-intellectuals	
Politicians[e]	55.8
Pop Stars[f]	66.9
Sportspersons[d]	97.8
TV Celebrities[g]	65.3

Notes: [a]$N = 118$. [b]$N = 105$. [c]$N = 134$. [d]$N = 136$. [e]$N = 154$. [f]$N = 127$. [g]$N = 124$.

6.3.2.2 Exploratory Factor Analyses

An initial series of Exploratory Factor Analyses (EFAs) was conducted to test the structure of the dependent variable, attitude towards high achievers. The EFAs were modelled on previous research carried out by Feather and colleagues that had consistently found two factors by which people evaluated high achievers (Feather, 1989a; Feather, 1993c, 1993d; Feather & McKee, 1992; Feather, et al., 1991). As such, the aim of these analyses was threefold. Firstly it was intended to replicate the factor structure by Feather and colleagues in their studies looking at attitudes towards tall poppies. Secondly, if it were not possible to replicate the factor structure of the attitudes so as to obtain a consistent measure across the eight high achievers, an examination of other options to create a dependent attitude measure would be undertaken. Finally, it was expected that there might be different factor structures for attitudes towards the different high achievers given the possibility that intellectual tall poppies might be viewed differently when compared with non-intellectual tall poppies. However, it may be required to use a single or parsimonious attitude measure to represent an attitude or attitudes towards each of the eight high achievers, to enable a valid comparison across groups. The details of these analyses are presented in Appendix A1.

As noted in Appendix A1 there was a pattern in the grouping of items on a multiple factor solution. Specifically, intellectuals (i.e., academics, poets, scientists, writers) were perceived as more complex than non-intellectuals (i.e., politicians, pop stars, sportspersons, tv celebrities) as analyses resulted in multiple factors suggesting simultaneous evaluations of a target across different dimensions. Initial EFAs suggested that intellectuals fitted the Good Mixer characteristics (i.e., emotional, friendly, in touch with the average person, high integrity, and attractive) and Self-Centred personality ratings (i.e., self-controlled, caring, polite, concerned for others, honest, unassuming, pleasant, trustworthy, and follows the rules) in accordance with research by Feather et al. (1991), whilst solutions for non-intellectuals did not. At the end of the EFAs, it was decided to retain a single factor solution given it was a much more parsimonious and homologous fit across the eight high achiever types.

6.3.2.3 Descriptives

The final attitude measure for every high achiever was the average of ten of the initial thirteen items as seen in Table 6.4.

Table 6.4

Means and Standard Deviations for Final Attitudes Towards High Achievers Items

Items / High Achiever	ACA		POE		SCI		WRI		SPO		POP		TVC		POL	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Honest	4.99	(1.27)	4.82	(1.17)	5.04	(1.15)	4.61	(1.07)	2.52	(1.24)	4.12	(1.04)	4.01	(1.08)	3.73	(1.14)
Polite	4.76	(1.26)	4.48	(0.89)	4.60	(1.10)	4.43	(1.12)	3.59	(1.43)	3.87	(1.29)	4.01	(1.25)	3.85	(1.27)
Trustworthy	5.04	(1.25)	4.49	(1.04)	4.80	(1.36)	4.52	(1.01)	2.62	(1.43)	3.96	(0.98)	3.95	(1.14)	3.81	(1.01)
Concerned for others	4.45	(1.26)	4.43	(1.12)	4.64	(1.29)	4.30	(1.18)	2.88	(1.45)	3.40	(1.30)	3.47	(1.27)	3.17	(1.30)
Pleasant	4.70	(1.16)	4.56	(0.99)	4.57	(1.00)	4.51	(1.01)	3.27	(1.34)	4.34	(1.20)	4.26	(1.22)	4.18	(1.20)
Unassuming	3.90	(1.18)	4.31	(1.01)	4.21	(1.11)	4.18	(1.08)	2.40	(1.08)	3.33	(1.25)	3.15	(1.24)	2.82	(1.07)
Self Controlled	4.93	(1.24)	4.22	(1.04)	4.86	(1.10)	4.35	(1.09)	4.15	(1.53)	3.71	(1.20)	3.71	(1.26)	3.90	(1.23)
In touch with average	4.28	(1.53)	4.19	(1.37)	3.96	(1.42)	4.40	(1.28)	2.64	(1.31)	3.75	(1.55)	3.73	(1.41)	3.25	(1.49)
High Integrity	5.23	(1.23)	4.58	(1.02)	5.36	(1.05)	4.66	(1.00)	3.19	(1.55)	3.95	(1.23)	4.23	(1.21)	3.81	(1.19)
Friendly	4.80	(1.25)	4.78	(1.00)	4.59	(1.05)	4.54	(0.97)	3.65	(1.38)	4.57	(1.24)	4.45	(1.18)	4.29	(1.25)
Total	4.79	(0.81)	4.45	(0.55)	4.71	(0.68)	4.43	(0.68)	3.16	(0.96)	3.95	(0.79)	3.96	(0.83)	3.73	(0.86)
N	120		104		138		145		154		134		150		126	

Note: ACA = Academics, POE = Poets, SCI = Scientists, WRI = Writers, POL = Politicians, POP = Pop Stars, TVC = TV Celebrities.

Word Pairings: Honest/Dishonest, Polite/Rude, Trustworthy/Untrustworthy, Concerned for Others/Self-Centered, Pleasant/Unpleasant, Unassuming/Arrogant, Self-Controlled/Quick Tempered, In touch with the average person/Out of touch with the average person, High Integrity/Low Integrity, Friendly/Unfriendly.

The ten character traits that made up the overall attitude towards each high achiever were Honesty, Politeness, Trustworthiness, Concern for others, Pleasantness, being Unassuming (e.g., modest), Self-Controlled, In touch with the average person, High Integrity, and Friendliness. Given the 7 point scale, higher scores indicated a greater amount of these qualities and conversely lower scores translate to lesser amounts of these characteristics. As such, higher scores indicated a more positive attitude and lower scores a more negative attitude towards the target.

The means and standard deviations presented in Table 6.4 for the high achievers showed some interesting trends between intellectuals and non-intellectuals. Overall, as well as across each individual item, non-intellectuals were rated as less positive on each characteristic. The total means for each high achiever also supported this notion, with the four intellectuals being rated more positively than the four non-intellectuals.

Due to sampling methods that resulted in a mixed between and within subjects design, comparisons between high achievers were not made using traditional ANOVA techniques. So, at this point only simple descriptive analyses are presented of the independent and dependent variables. Multilevel Modelling statistical analyses, which allow for missing values across the context level, are discussed in section 6.3.2.4.

In line with Feather, Volkmer, and McKee's (1991) causes about how and why high achievers obtain their positions, deservingness was conceptualised by the highly related factors of internal and external attributions. Each pair of items relating to internally achieved causes or outcomes (i.e., achieved their position through hard work and effort, and achieved their position through ability and talent) and externally achieved causes or outcomes (i.e., achieved their position through opportunity or luck, and achieved their position through help from others) were respectively averaged to reflect their higher order factors. The means and standard deviations, as displayed in Table 6.5, provide an initial indication of the trends of ratings of levels of internal (i.e., deservingness) and external attributions of success across each high achiever.

Table 6.5

Means and Standard Deviations for Causal Attributions of Success across each High Achiever

High Achiever	Causal Attributions					
	Internal		External			
	M	*SD*	*M*	*SD*	N	Theoretical Range
Academic	6.00	0.97	4.06	1.19	118	1 (NI) – 7 (EI)
Poet	5.59	1.18	4.25	1.20	105	1 (NI) – 7 (EI)
Scientist	6.09	0.97	3.97	1.14	134	1 (NI) – 7 (EI)
Writer	5.85	1.06	4.40	1.16	137	1 (NI) – 7 (EI)
Politician	4.44	1.37	4.76	1.15	154	1 (NI) – 7 (EI)
Pop Star	5.00	1.21	5.53	1.22	127	1 (NI) – 7 (EI)
Sportsperson	6.11	0.94	4.51	1.10	137	1 (NI) – 7 (EI)
TV Celebrity	4.70	1.29	5.52	1.09	124	1 (NI) – 7 (EI)

Notes: NI = Not important as a cause, EI = Extremely important as a cause.

The trends across the high achiever types show that with the exception of sportspersons, only the intellectuals were rated well above the midpoint of the scale for level of internal attributions. However, all of the high achievers were on average rated above the midpoint of the scale, reflecting a general consensus that both intellectual and non-intellectual high achievers were deserving of their achievement through internally attributed actions. Pop Stars and TV Celebrities were rated to have achieved their position through externally attributed actions more so than the rest of the non-intellectual high achievers, and even more so when compared to intellectual high achievers. Again, all high achievers were on average above the midpoint for ratings on external level of deservingness, with intellectual high achievers rated as having achieved their success relatively less on externally attributed actions when compared to non-intellectual high achievers. An ANOVA could not be carried out on the sample given the methodology of a between and within subjects design where not all participants responded to the same set of high achievers, however Multilevel Modelling is presented in section 6.3.2.4 to account for this.

In order to control for any influence of demographic variables on the dependent variables, preliminary correlations between key demographic

variables and attitudes towards tall poppies were conducted. The results indicated that the Favour Fall of Tall Poppies increased alongside university attendance (r=.23, p<.01, N=266). Furthermore, when compared to females, male participants were significantly more likely to Favour the Fall of Tall Poppies (r=.18, p<.01, N=265). Finally, there was no significant relationship between age and the Favour Fall of Tall Poppies (r=.08, p>.05, N=266).

6.3.2.4 Multilevel Modelling

A single repeated measures Multilevel Model was computer using MlwiN version 1.10.0007 (Rasbash, Browne, Healy, Cameron, & Charlton, 2001). Multilevel Modelling aims to explain the variance in a response variable(s) resulting from different levels of effect. In this research, the eight high achiever types were treated as within-groups one-level factor due to the nature of the sampling. That is, because each participant was asked about four different high achievers (two intellectuals and two non-intellectuals), but not necessarily the same set of high achievers as other participants, attitudes measures taken across each participant were tested at each level of the variable (i.e., attitudes towards intellectuals and attitudes towards non-intellectuals). Furthermore, each participant rated a different group of four of the eight possible high achiever targets on attitude items to counterbalance for possible order effects on attitude ratings. This meant that the attitude target is also considered between-groups factor, as different participants responded to different targets and combinations of targets.

In this study, two levels of effect on attitudes were examined, the eight high achievers and the different participants. Thus, the variance attributable to the Level 1 within group effect in this study gives an indication of how much attitudes vary across target contexts, and the Level 2 between group effect indicates how much attitudes vary across participants.

Predictor variables are also separated into two levels. In this study, the Level 1 predictor was the categorisation of the high achiever as either an intellectual or a non-intellectual in line with results from the Pilot Study (see 6.2). Linear order effects were also included as Level 1 predictors to control for any effects due to the order that the four target contexts were presented. Level 2

predictors were the independent variables measured at the individual level, the Favour Fall of Tall Poppies and Deservingness (i.e., internal attributions). Age and Survey Order were used as covariates, as they were found to influence attitudes towards high achievers (see Appendix A2 for the covariate model**s**), whilst religiosity and other demographics were surprisingly not found to predict attitudes towards high achievers.

A series of models of increasing complexity were fitted to the data. Each model is statistically compared to the previous model (using the change in the -2 Log likelihood statistics) to determine whether the addition or removal of parameters improves the fit of the model.

After establishing the null model, and the first model with the required covariates (Model 2), Model 3 tested the influence of the Favour Fall variable on attitudes towards high achievers in order to test the hypothesis whether an established measure of attitudes towards tall poppies predicts attitudes towards all tall poppies. To test the hypothesis of whether attitudes towards tall poppies are best understood in terms of intellectuality as opposed to the existing generalised measure, Model 4 also tested to see if Intellectuality (i.e., intellectual or non-intellectual) can predict attitudes towards high achievers above and beyond that from the Favour Fall subscale of the generalised attitudes towards tall poppies scale. Model 5 will then add an interaction between Favour Fall and Intellectuality, to test the hypothesis that attitudes towards intellectual and non-intellectual high achievers is influenced by a person's desire to favour the fall of tall poppies in general. Model 6 will then test the impact of deservingness along with an interaction with intellectuality on attitudes towards high achievers, to test whether attitudes towards high achievers differ based on the intellectuality and level of deservingness. The final model will combine the results from significant models, to arrive at a conclusive and parsimonious understanding of attitudes towards high achievers. The results for the increasingly complex models can be found in Table 6.6.

Table 6.6

Multilevel Model Parameter Estimates for Attitude Towards High Achievers

Parameter	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Intercept	4.12 (.03)	4.39 (.08)	4.71 (.16)	4.16 (.16)	4.42(.18)	2.84 (.15)	3.25 (.21)
Level 1 (Context)				Fixed Parameters			
Order 5[a]		.30*(.09)	.26*(.10)	.25*(.10)	.26*(.10)	.27*(.09)	.26*(.10)
Intellectuality				.92*(.05)	.28(.22)	.73*(.23)	.11 (.21)
Level 2 (Individual)							
Age		-.01*(.00)	-.01*(.00)	-.01*(.00)	-.01*(.00)	-.01*(.00)	-.01*(.00)
Favour Fall			-.07 (.04)	-.06 (.04)	-.14*(.05)	—	-.11*(.05)
Deservingness						.21*(.02)	.21*(.02)
Favour Fall x Intell.					.18*(.06)		.18*(.06)
Des. x Intell.						.00 (.04)	
Level 1 (Context)				Random Parameters			
Intercept	.88 (.04)	.89 (.04)	.89 (.05)	.61 (.03)	.61 (.03)	.55 (.03)	.54 (.03)
Level 2 (Individual)							
Intercept	.01 (.02)	-.02 (.02)	-.02 (.02)	.05 (.02)	.05 (.02)	.05 (.02)	.05 (.02)
-2*log likelihood	2915.84	2886.434	2780.39	2489.28	2480.84	2391.53	2373.40
df	1	3	4	5	6	6	7

Note: *$p < .05$, $N = 285$.

[a] See Table A2.1 and Table A2.3 for a discussion of Order 5 effect.

Des. = Deservingness.

The results in Table 6.6 show that the model containing the covariates (Model 2) was a significantly better fit than the model with no predictors (Model 1), $\Delta LL = 661.82$, $df = 3$, $p < .001$. This difference suggested that the Contextual and Individual variables contributed significantly to the variation in the participants' attitudes towards high achievers. The Level 1 fixed effect parameters for Model 2 determine which context variables are associated with attitudes towards high achievers, whilst the Level 2 fixed effect parameters for Model 2 determine which individual variables are related to attitudes towards high achievers. These estimates are comparable to regression coefficients and are considered significant when they are approximately twice the size of their standard error.

The intercepts for the fixed effects (top line of Table 6.6) give the mean attitude scores averaged across all levels, controlling for all predictor variables. The unadjusted mean level of attitudes towards high achievers was 4.12, suggesting that on average participants were neither positive nor negative towards high achievers. The intercepts for the random effects provide an indication of the amount of variation in attitudes that is attributable to the two levels. The null model (Model 1) and the first model with covariates (Model 2), have non-significant Level 1 variance, suggesting that different participants in this sample did not vary much in terms of their attitudes towards the targets.

The random effect intercept for context (Level 1) was large in relation to its standard error, indicating that attitudes varied considerably across the eight high achiever types. Derived from the random intercept parameters for Model 2 in Table 5.7, 98% (i.e., .89/[.02+.89]) of the variance in attitudes was attributable to the context when compared to the individual. Addition of predictors in subsequent models assessed the reasons for the variation in attitudes towards high achievers across both individual and context levels simultaneously. With the addition of the Favour Fall subscale from the Attitudes Towards Tall Poppies scale which was nearing significance, Model 3 was a significant improvement over the previous model, $\Delta LL = 106.04$, $df = 1$, $p < .001$. This indicated that attitudes towards high achievers were almost significantly and weakly associated with support for the favour fall of tall poppies, such that the more someone wanted to see a tall poppy fall from their position the more likely they were to rate the high achiever targets favourably.

In order to see whether attitudes towards high achievers were predicted by intellectuality above and beyond the established Favour Fall towards Tall Poppies, this Level 2 predictor was added in Model 4. A significant effect would support the hypothesis that there was something beyond the Favour Fall of Tall Poppies that explained attitudes towards both intellectual and non-intellectual high achievers. The addition of intellectualism significantly improved the model, $\Delta LL = 291.11$, $df = 1$, $p < .001$. Furthermore, the variance in attitudes due to individual predictors was 7.6% (i.e., .05/[.05+.61]), and 92.4% (i.e., .61/[.05+.61]) was attributable to context. The total amount of variation in attitudes due to the context dropped from .89 in Model 3 to .61 in Model 4, meaning that intellectuality was able to reduce the unexplained contextual variance by 20.46% (i.e., .89-[.61/.89]).

Model 5 tested the addition of the interaction term between the Favour Fall of Tall Poppies and level of Intellectualism. A significant interaction would indicate that favouring the fall of tall poppies would affect intellectuals and non-intellectuals differently. As hypothesised, it was expected that intellectual high achievers (e.g., academics, scientists, writers) would be seen to be more deserving of having achieved and maintaining their success. Thus, it was expected that as attitudes towards the favour fall of tall poppies increased, so would favourable attitudes towards intellectuals when compared to non-intellectuals. With the addition of this interaction term between Favour Fall and intellectuality, the model was significantly improved, $\Delta LL = 8.44$, $df = 1$, $p < .01$. The level 2 predictor of intellectuality was no longer significant ($\beta = .28$ $SE = .22$), however this was due to the interaction term now being significant ($\beta = .18$ $SE = .06$). The variance in attitudes due to individual predictors was still 7.6% (i.e., .05/[.05+.61]), and 92.4% (i.e., .61/[.05+.61]) was attributable to context.

Models 6 and 7 tested the effects of deservingness and level of intellectuality independent of the effects of the Favour Fall of Tall Poppies. With the addition of the deservingness variable and its interaction with intellectuality, it was expected that deservingness would significantly predict attitudes towards intellectuals. Furthermore, it was also expected that the interaction effect would support the idea that attitudes towards high achievers were seen to be more positive when deserving of their achievement, especially for intellectual high achievers when compared with non-intellectual high achievers. The addition of the Deservingness predictor (i.e., internal attributions), and its interaction with level of intellectuality, in Model 6

showed that only internally attributed factors of deservingness were a significant predictor ($\beta = .21$ $SE = .02$) of attitudes towards high achievers. However, there was no significant interaction effect between level of intellectuality and deservingness. As such, this interaction was dropped from further analyses.

The final model (Model 7) tested whether the addition of the internally attributed factors of deservingness to the best model so far (Model 5) would explain any additional variance in attitudes towards high achievers above and beyond level of Intellectuality, the Favour Fall of Tall Poppies and Intellectuality x Favour Fall of Tall Poppies. The model was a significant improvement over Model 5, $\Delta LL = 107.44$, $df = 1$, $p < .001$. The total amount of variation in attitudes due to the context dropped from .61 in Model 5 to .55 in Model 7, meaning that the addition of Deservingness was able to reduce the unexplained contextual variance by 9.84% (i.e., .61-[.55/.61]). This indicated that positive attitudes towards high achievers was significantly predicted by the Favour Fall of Tall Poppies and internally attributed causes. Finally, in order to understand the interaction, Favour Fall of Attitudes towards Tall Poppies versus Predicted Attitudes towards high achievers is presented below in Figure 6.1.

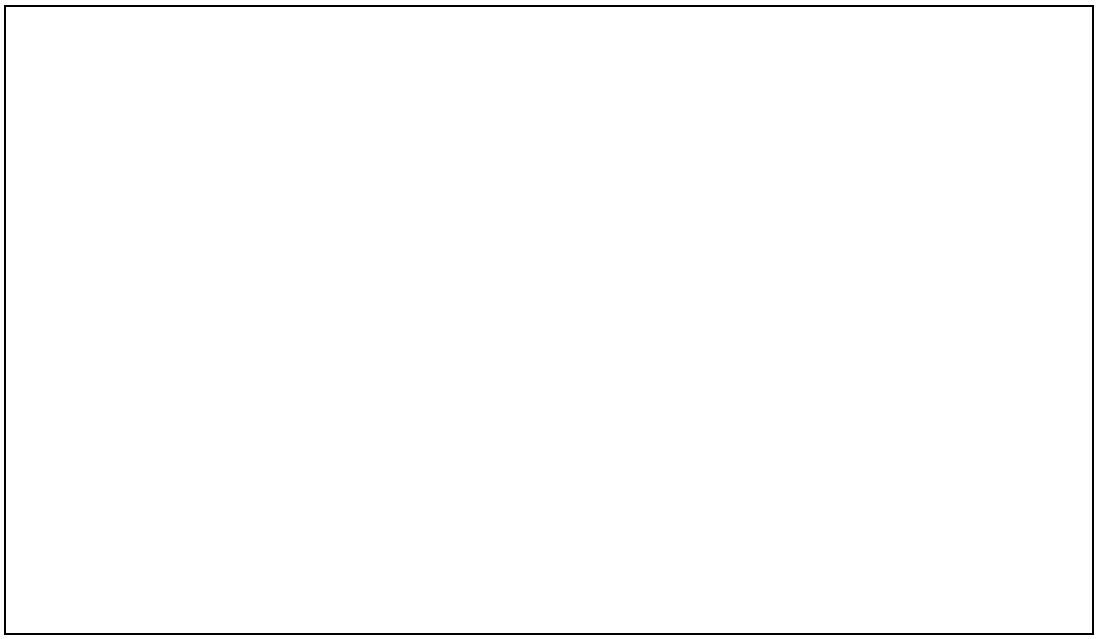

Figure 6.1. Favour Fall of Tall Poppies as a predictor of attitudes towards high achievers.

Notes: Predicted Attitudes towards High Achievers axis does not cover the entire range [1-7] in order to accentuate interaction effects.

As can be seen from Figure 6.1, predicted attitudes towards high achievers has a different rate of change across the Favour Fall of a Tall Poppy dependent on the type of Tall Poppy. For example, predicted attitudes towards non-intellectual high achievers (e.g., politicians, sportspersons) is constant irrespective of a person's level of Favour Fall towards Tall Poppies. In contrast, for intellectuals as the level of Favour Fall towards a Tall Poppy increases, so does the predicted attitude towards intellectual high achievers (e.g., academic, scientist). Thus, the difference in attittudes between intellectual and non-intellectual increases with the Favour Fall of Tall Poppies.

6.3.3 Discussion

Both the pilot study and first study of the present thesis provided support for the predictions relating to intellectuality and the tall poppy syndrome. Specifically the pilot study found that the hypothesis relating to categories of tall poppies (e.g., sportspersons or scientists) proposed on a continuum of intellectuality (i.e., non-intellectual to intellectual) were supported. That is, categorised intellectual high achievers were rated more intellectual when compared to non-intellectual high

achievers. Also in accordance with the hypotheses relating to intellectuality and "tall poppiness", it was found that non-intellectuals were rated more so as tall poppies when compared to intellectual high achievers. The results from the first study replicated and extended those from the pilot, as it was found that intellectual high achievers (e.g., academics, scientists, poets, and writers) were viewed less as tall poppies, and more deserving of their success when compared to non-intellectual high achievers (e.g., politicians, pop stars, sportspersons, tv celebrities). Thus, this indicated that intellectual high achievers were distinctive from non-intellectuals, and this was partly as a result of perceived level of deservingness.

As reflected from both the pilot and the main study, attitudes varied across the eight different high achiever types, with intellectuals being rated more positively when compared to non-intellectuals. That is, intellectual high achievers such as academics, poets, scientists, and writers were rated more favourably on several personality characteristics than politicians, pop stars, and tv celebrities. However, contrary to other non-intellectual high achievers, sportspersons were seen as favourably as the intellectuals.

The pilot study also found that intellectuals who were rated more positively were also less likely to be rated as tall poppies, perhaps indicating a relationship between perceived intellectuality and deservingness. Thus, it seemed that whilst there were distinctions between the intellectual and non-intellectual high achievers, both were viewed as tall poppies. Furthermore, this distinction could have been reliant on judgements of how they had achieved their success. This was further evident from the sportspersons group, given that they were rated as favourably as intellectuals, perhaps given they can be characterised as deserving of their success due to the obvious effort and hard work that is recognised as a requirement for their success.

In relation to achievement literature (Feather, 1992, 1994a, 1999b), deservingness occurs where an outcome follows a congruently valued behaviour. That is, when actions such as hard work and effort (i.e., positively valued behaviours) result in a positively valued outcome (i.e., success or achievement), then the person is judged as being deserving of his or her success. Conversely, when actions such as cheating or laziness (i.e., negatively valued behaviour) result in a positively valued outcome (i.e., success or achievement), then the person may be judged as being undeserving of his or her success. In addition to whether a

congruent outcome follows the behaviour, outcomes are seen to be undeserved when the person is not seen to be responsible for them. For example, actions that are uncontrollable (control) and internal or external to the person (locus) are viewed as undeserved when compared to controllable actions (Weiner, et al., 1988). So, whilst all tall poppies were classified as high achievers, the intellectual high achievers were generally rated as having achieved success through hard work and effort (internal and controllable actions), whilst the non-intellectual high achievers were rated as having achieved success more often through opportunity and good luck (external, as well as controllable and uncontrollable actions).

Whilst the main findings from the study showed that attitudes towards tall poppies increased alongside intellectuality and deservingness, no significant interaction was found between the two. This was despite the trend that showed more positive attitudes towards intellectuals (e.g., academics and scientists), who were also rated high on internal causes for success when compared to non-intellectuals (e.g., pop stars and tv celebrities). It is possible that deservingness and intellectuality did not interact due to the atypical non-intellectual tall poppy class of sportsperson, as this tall poppy was typified as both deserving of their achievement through internal means in addition to being classified a non-intellectual high achiever. This was in contrast to other non-intellectual high achievers who were generally rated as less deserving of their success through internally attributed means when compared to intellectual high achievers.

It is also a possibility that the significant two-way interaction between favour fall of a tall poppy and intellectuality related to deservingness of maintaining one's present position, rather than being deserving of having achieved that position. That is, judgements of the favour fall of a tall poppy relate to judgements about whether high achievers should be brought down from their present position, and it is likely that these judgements would be influenced by attributions of deservingness. Interestingly the results showed that the more a person called for the *lopping* of tall poppies in general, the more they were favourable towards intellectuals such as academics, poets, scientists, and writers. A probable explanation is that, as no information was provided about these intellectual categories other than vocation, the participants evaluated them based on salient characteristics that could have had ties to deservingness of achievement, and also the maintenance of the present position.

That is, judgements were made about scientists and academics relating to how they had achieved their success, and perhaps also how deserving they were of maintaining their position. Concurrent to this, judgements about the favour fall of tall poppies referred to the maintenance of an established position of success or achievement, and the attitudes towards intellectuals (i.e., persons deserving of their achievement and probably the maintenance of their position) increased alongside attitudes calling for the removal of tall poppies from their present positions. An explanation for this effect could be that persons evaluated intellectual tall poppies as deserving to maintain their present position, given that they had already earned it (i.e., success attributed to internal actions).

Although deservingness was an important and significant predictor, the established measure relating to the Favour Fall of Tall Poppies (Feather, 1989a) also had a significant impact on attitudes towards high achievers. So whilst deservingness predicted attitudes towards tall poppies above and beyond Favour Fall, and Intellectual classification, sentiments relating to the Favour Fall of Tall Poppies still significantly predicted attitudes towards high achievers. For example, persons who agreed that *very successful people who fall from the top usually deserve their fall from grace* and that *it's very good to see very successful people fail occasionally* were more likely to rate high achievers as having *high integrity*, being *self controlled*, and *trustworthy* amongst other favourable characteristics.

In general it was found that attitudes towards intellectual tall poppies were more favourable when compared to non-intellectual tall poppies. This was qualified by a significant two-way interaction between Intellectuality and the Favour Fall of Tall Poppies. Recall the items in the Favour Fall subscale of the Tall Poppy Scale (Feather, 1989a) relate to concepts of equality, fairness, and justice, and tap into the Australian distrust for special excellence and a dislike of authority and status seekers (Hancock, 1930). It was found that attitudes towards the tall poppies increased alongside beliefs that *people who are "tall poppies" should be cut down to size* and *very successful people usually succeed at the expense of other people* for intellectual tall poppies (e.g., academics and scientists) but stayed constant for non-intellectuals (e.g., politicians and sportspersons). That is, as attitudes supporting the favour fall of tall poppies increased so did positive attitudes towards intellectual tall poppies.

Feather et al. (1991) reported that deservingness to achieve a present position and to maintain that position was negatively correlated with Self-Centred personality

ratings (i.e., self-controlled, caring, polite, concerned for others, honest, unassuming, pleasant, trustworthy, and follows the rules) and positively correlated with Good Mixer characteristics (i.e., emotional, friendly, in touch with the average person, high integrity, and attractive). Furthermore Self-Centred characteristics were found to be positively correlated with the Favour Fall of Tall Poppies, and Good Mixer characteristics were found to be negatively correlated with the Favour Fall of Tall Poppies. Feather et al. also reported that Favour Fall attitudes towards tall poppies were found to be negatively correlated to both the deservingness rating of present position and maintenance of position. A plausible explanation for the positive increase in favourability towards intellectual tall poppies alongside an increase in attitudes favouring the fall of tall poppies on one hand could relate to distinctive and salient characteristics of these intellectual tall poppies when compared with the non-intellectual tall poppies. That is, when asked to rate tall poppies such as sportspersons and scientists, persons may have responded to the favour fall items (which refer to deservingness of maintaining present position) by considering how deserving these high achievers were of attaining their present position. Thus, in the case of intellectuals, and perhaps sportspersons, deservingness of both maintaining and achieving present position could have been made salient whilst responding to items relating to the Favour Fall of tall poppies.

So whilst the results from the pilot study and existing literature support the claim that intellectuals are tall poppies due to their level of achievement and success, the results from Study 1 suggest that intellectual tall poppies are quite distinct from the traditional non-intellectual tall poppies. These academics, poets, scientists, and writers were all seen to be deserving of their success through hard work and effort, behaviours that are valued in Australian society (Feather, 1989a). A possible explanation for the increase in attitude alongside the rise in the favour fall of tall poppies is the salience of the perceived personality characteristics and deservingness to maintain their present position. Critchley (2008) found that when persons perceived scientists as benevolent they were also more likely to characterise them as trustworthy, competent, and less self-interested when compared to scientists who were less benevolent. Thus, whilst these moral characteristics were all distinct from the concept of deservingness, it would follow that these positive beliefs about scientist traits would be tied in with ideas about the success and maintenance of their high achievement. This suggests that ratings of scientists might be more than just

deservingness or competence, and it could related to moral integrity and values associated with the scientist and their research. These results also provided information about the ratings of the different tall poppies on internally and externally attributed achievement.

External causes or actions, the level by which the tall poppies achieved their success through opportunity or luck and help from others, was only examined briefly in the descriptives (see 6.3.2.3). A possible interpretation from the causal attribution literature (e.g., Weiner, 1986) and deservingness theory (e.g., Feather, 1992) would suggest that since achievement is something that is valued in Australian society, positive attitudes towards those achievers would only follow positively valued behaviours. That is, if the locus of behaviour is external (e.g., help from others) and uncontrollable (e.g., luck), for the outcome to be seen deserving and congruent with the actions, it would have to be negative. Thus, support for causal attribution models (e.g., Weiner, 1985, 1986; Weiner, et al., 1988) and the theory of deservingness (e.g., Feather, 1992, 1996) was shown as perceptions of tv celebrities or pop stars were rated more as externally attributed actions or causes, and viewed less positively on attitudinal dimensions when compared to intellectual high achievers.

The findings and interpretations from the present study should be viewed as an initial step into understanding how the Tall Poppy Syndrome impacts on intellectual high achievers, and what the key predictors of attitudes towards them are. The initial pilot and Study 1 did add to the established literature investigating attitudes towards tall poppies, but is prudent in its interpretations of findings. The present study measured attitudes towards tall poppies in general (e.g., scientists, sportspersons) and not exemplars (e.g., Tim Flannery, Lleyton Hewitt). Feather et al. (1991) found that judgements of tall poppies increased with the amount of information available and depending on what information was made salient. That is, when information about the tall poppy was reduced, the initial status of the tall poppy impacted on a persons' judgement of them. Thus, whilst the pilot and Study 1 focussed on the effect of perceived intellectualism on attitudes towards tall poppies, the absence of descriptives about the high achievers could have affected the results. In particular, the lack of information about the target high achiever may have made status salient, perhaps making it hard to generalise to real life situations where more information is available to the perceiver.

Further studies in this thesis will take these other factors into consideration (i.e., type of work carried out by the tall poppy and their level of intellectualism), and detail their effects on the perceptions of tall poppies. In conclusion, the pilot and Study 1 of this thesis added some newfound interpretations to the existing literature on the tall poppies. Results from Study 1 suggested that the link between being a tall poppy and an intellectual was related to judgements of deservingness. Intellectual tall poppies (i.e., academics, poets, scientists, and writers) were all viewed as having deserved their achievement through internally attributed means more so than non-intellectual high achievers (i.e., politicians, pop stars, sportspersons, tv celebrities). Given that achievement through hard work or effort is one of the requirements for a high achiever or person of status not to succumb to the tall poppy syndrome, the paradox lies in ascribing the traditional tall poppy moniker to intellectual high achievers as they are stereotypically viewed as deserving of their achievement.

Recent shifts in the usage of the term tall poppy, as exemplified by its use as a "metaphor for excellence and endeavour…(symbolising) Australia's pride in outstanding achievers in all fields" ("The Tall Poppy Campaign," 2007), can explain the apparent idiosyncrasies between deservingness and attitudes towards these high achievers. Thus, whilst intellectual high achievers are viewed as deserving and not *classic* tall poppies, they are certainly not immune from the tall poppy syndrome. Research by Feather has found that other individual differences such as global self-esteem and perceived level of competence (Feather, 1991a), as well as values relating to power, achievement, and equality (Feather, 1989a; 1996) all influence the perception of tall poppies. So, whilst deservingness is a key predictor of attitudes towards tall poppies, it is and will be argued that intellectualism both perceived in the target and from the perceiver is an important construct that should be taken into account in understanding perceptions of tall poppies.

CHAPTER 7

STUDY TWO: ARE SCIENTISTS TALL POPPIES ?

7.1 Overview of the Chapter and Introduction

The second study reported in this thesis investigated how perceptions of a group of tall poppies are based on conservative values and attitudes towards intellectual activities as well as general attitudes towards high achievers. Thus, this second study will follow from the Study 1 findings that attitudes towards intellectuals (e.g., scientists) were related to aspects of deservingness of achievement and maintenance of position. Therefore the aim is to clarify whether in fact scientists are perceived as tall poppies and are predicted by general attitudes towards tall poppies, or whether attitudes and beliefs about intellectual principles and activities and ideals are better predictors of attitudes towards scientists. This study tested a model (see Figure 7.1) that predicts attitudes towards scientists as stemming from two concepts: a general attitude towards whether tall poppies should be brought down from their position, and also beliefs against the pursuit of intellectual activities and ideals that may relate to conservative values.

Firstly, the study explored whether attitudes towards scientists are better predicted by attitudes relating to attitudes towards intellectual activities or generalised attitudes towards the support or fall of tall poppies. Although an unexpected finding in Study 1 and the Pilot, that those who supported the fall of tall poppies would express more positive sentiments towards tall poppies, it was expected that in Study 2 this would be replicated. That is, those who supported the fall of tall poppies would report more positive attitudes towards scientists due to the deservingness aspect of how scientists have attained their position. Findings from Study 1 support the claim that scientists are seen to deserve their position and status as it has been earned through attributes that are deserved (i.e., hard work and effort), and that when this is the case those high achievers are not as likely to be brought down from their position of status when compared to those seen to be less deserving (i.e., achieved their success through good luck or fortune). Furthermore, it was predicted in line with the similarity/attraction hypothesis (Byrne, 1971), Social

Identity and Social Categorisation theories (e.g., Tajfel & Turner, 1985; Turner, 1987), as well as Social Comparison Theory (e.g., Salovey & Rodin, 1984; Salovey, et al., 1991; Tesser, 1986; Tesser, et al., 1991) as discussed in Section 2.3.5, that those who value learning, understanding, and a search for knowledge (i.e., the antithesis of anti-intellectual attitudes) are also more likely to be favourable towards scientists when compared to those who have more favourable attitudes towards intellectual activities. Expressed in another way, negative attitudes towards scientists would occur where persons are not in support the fall of a tall poppy, thus believing they are deserving to maintain their present position and status, and these negative attitudes towards scientists should stem from those who do not value intellectual ideals such as learning, understanding, and creativity (i.e., anti-intellectualism).

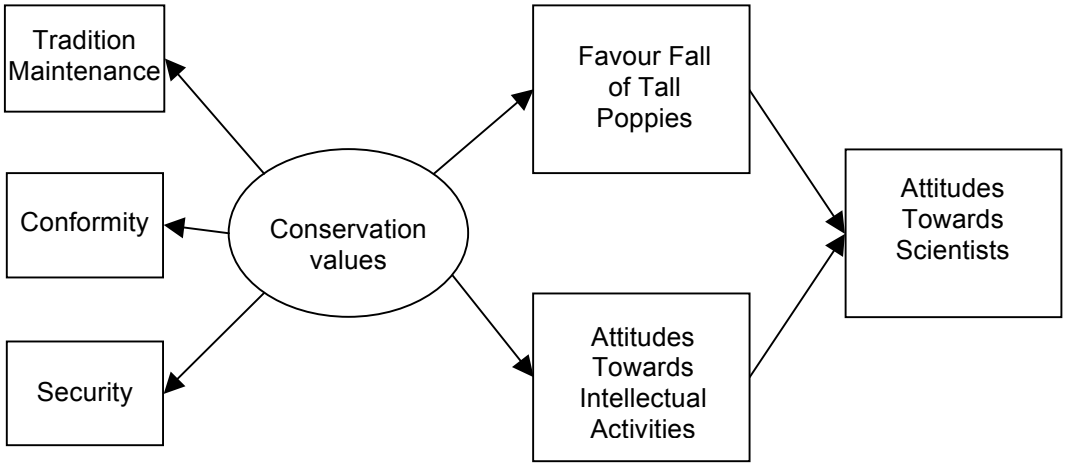

Figure 7.1. Theoretical model predicting attitudes towards scientists.

The present study will also investigate how conservative values influence judgements of intellectual high achievers, directly and indirectly through their effect on anti-intellectual attitudes (see Figure 7.1). In particular, in line with theoretical and empirical research presented in Section 2.3.2 and explicated in 5.3.1, it is expected that personal values relating to Conservation will positively predict attitudes towards intellectual activities, and these values will in turn influence attitudes towards scientists. Furthermore, research by Feather (1989a) has demonstrated the links between Conservation values and attitudes towards tall poppies (see 2.3.2.1). Thus, it is expected that those with stronger Conservation

values and greater negative attitudes towards intellectual activities will be less favourable towards scientists because they do not enjoy or like intellectual activities. Furthermore, those higher on Conservation values should also enjoy the bringing tall poppies down from their position, however it is expected that in line with Study 1 that those who Favour the Fall of Tall Poppies will be more favourable to scientists.

7.2 Method

7.2.1 Participants

From an initial representative sample of 1208 Australians over the age of 18 who participated in an initial telephone interview via a computer assisted telephone interviewing facility (see Critchley, 2008, for details of this sample), a sample of 458 participants (212 males and 246 females) completed a follow-up questionnaire. The majority of respondents were born in Australia (81.4 per cent), with 7.8 and 1.9 percent listing the United Kingdom and New Zealand respectively, as their place of birth. More details of the sample and recruitment are described in 7.2.3. Due to the methodology of sampling, participant age was collected as a categorical variable and is presented in Table 7.1.

Table 7.1

Frequency of Respondents' Decade of Birth

	Sample (percentage)	Population (percentage)
1980s	34 (7.4)	2,687,413 (17.18)
1970s	73 (15.9)	2,726,217 (17.43)
1960s	96 (21.0)	2,928,463 (18.72)
1950s	94 (2.5)	2,710,304 (17.33)
1940s	92 (2.1)	2,105,023 (13.46)
1930s	41 (9.0)	1,327,856 (8.49)
1920s	23 (5.0)	891,014 (5.70)
1910s	4 (.9)	247,540 (1.58)
1900s	1 (.2)	15,516 (.10)

Note: $N = 458$.

Australian population total used for comparison is 15,639,346 as no persons under 18 years of age were sampled.

As can be seen from Table 7.1, the ages in the sample were normally spread across the sample (Australian Bureau of Statistics, 2005b). A Chi-Square analysis showed that there was a significant difference between the sample and the population, χ^2=47.39, *df* = 8, *p* <.01. However, this may have been due to the low sample proportion of respondents born in the 1980s. Also, whilst the sample was taken from a wide range of people across Australia, it was only unrepresentative of the populations as a whole due to a low number of indigenous Australians, ethnic and immigrant groups. Respondent place of residence is shown below in Table 7.2.

Table 7.2

Respondents' State of Residence

	Frequency (percentage)	Population (percentage)
Australian Capital Territory	10 (2.2)	324,034 (1.63)
New South Wales	139 (33.3)	6,549,177 (32.9)
Northern Territory	9 (2.0)	192,898 (.9)
Queensland	105 (22.9)	3,904,532 (19.7)
South Australia	27 (5.9)	1,514,337 (7.6)
Tasmania	15 (3.3)	476,481 (2.4)
Victoria	131 (28.6)	4,932,422 (24.8)
Western Australia	22 (4.8)	1,959,088 (9.9)

Note: *N* = 462.

The distribution of participants was similar to the Australian state-wide population distribution in Australia (Australian Bureau of Statistics, 2005a), with the majority of respondents being from New South Wales, Victoria, and Queensland. However, a Chi-Square analysis showed that there was a significant difference between the sample and the population, χ^2=26.72, *df* = 7, *p* <.01. The participants were highly educated for the most part, and distributions are presented in Table 7.3.

Table 7.3

Education Level, and University Employment

	Frequency (percentage)
Education Level	4 (.9)
Primary	4 (.9)
Some Secondary	51 (11.1)
Completed Secondary	89 (19.4)
Trade Qualification	38 (8.3)
TAFE or Diploma Level	74 (16.2)
Incomplete Tertiary	35 (7.6)
Complete Tertiary	98 (21.4)
Postgraduate	68 (14.8)
University study[b]	197 (43.1)
University work[c]	55 (12.1)

Note: [a]$N = 458$. [b]$N = 457$. [c]$N = 455$.

University study relates to currently enrolled in a University course. University work relates to currently employed in an Australian University.

Almost 60 percent of the sample reported either achieving or attempting a Tertiary degree (i.e., including TAFE or Diploma). Also, just over 10 per cent of participants reported having worked in a University institution. No statistical comparisons were made between the sample and national data, as the categories were not identical to available statistics. A series of questions were also asked about the employment status and occupation of respondents, and results are presented in Table 7.4.

Table 7.4

Employment Status and Occupation of Respondents

	Frequency (percentage)
Employment Status[a]	
Unemployed	26 (5.7)
Part-time Work	81 (17.7)
Full-time Work	154 (33.6)
Part-time Parenting	28 (6.1)
Full-time Parenting	3 (.7)
Part-time Student	11 (2.4)
Full-time Student	18 (3.9)
Other	133 (29.0)
Occupation[b]	
Skilled/Unskilled	53 (11.6)
Sales/Services/Clerical routine	60 (13.1)
Supervisor/Self Employed	49 (1.7)
Professional/Managerial/Director	86 (18.8)
Part-time Student	1 (.2)
Full-time Student	25 (5.5)
Full-time Homemaker	46 (1.0)
Unemployed	23 (5.0)
Other	114 (24.9)
Refused	1 (.2)

Note: [a]$N = 454$. [b]$N = 458$.

Skilled/Unskilled refers to Tradespersons and Related Workers, Intermediate Production and Transport Workers, and Labourers and Related Workers (Australian Bureau of Statistics, 1997). Discrepancy in sample numbers due to Employment Status taken at time 2, whilst Occupation at time 1.

The plurality of participants reported that they were engaged in Full-time work, whilst over six per cent and five per cent noted they were studying or unemployed respectively. Circa 30 per cent of participants reported some 'Other' category for employment status. The plurality of respondents, who did not select other from the lists of occupation, described themselves as Professional/Managerial/Directors, whilst about half as many reported their

occupation as Full-time homemaker, Supervisor/Self Employed, Sales/Services/Clerical routine, or Skilled/Unskilled workers. Again, no statistical comparisons were made between the sample and national data, as the categories were not identical to available statistics. About five percent were studying at time two of the survey.

7.2.2 Materials

7.2.2.1 Attitudes towards tall poppies scale

The Tall Poppy Scale (Feather, 1989a) was used to assess the general attitudes towards tall poppies. See Study 1 for a detailed description of the scale. In the present study reliability was found to be acceptable, ranging between .53 and .81 for the Favour Reward and Favour Fall scales respectively (see Table 7.6). As in Study 1, the Favour Fall subscale was used to represent attitudes towards tall poppies.

7.2.2.2 Attitudes towards scientists semantic differential attitude scale

The semantic differential scale consists of a series of bipolar adjectives that are on a continuum (in this case, a 7-point scale). See Study 1 (Section 6.3.1.2.2) for a detailed description of the scale. It is an adaptation of the *Attitudes towards high achievers* scale from Study 1, however this one is targeted at scientists and not tall poppies in general (e.g., sportspersons, pop stars). Participants were asked to rate these word pairs on a 7-point bipolar adjective scale as to how representative they are of scientists in general. For example, people were asked "I think Australian Scientists are …" Unassuming / Arrogant. Items across attitude targets were re-ordered and counterbalanced to minimise responder bias and acquiescence. Reliability was good, and is noted in Figure B2.3 (see Appendix B2).

7.2.2.3 Need for Intellection scale

The Need for Intellection (NFI) scale (Eigenberger, Marques, & Critchley, 2010) was used to assess an individual's attitude towards intellectual activities. Participants are asked to rate on a 5-point scale to what extent they believe 20 statements were false or true for them (1 = Completely false; 2 = Mostly false; 3 =

In between; 4 = Mostly true; 5 = Completely true). Twelve of the 20 statements were phrased such that a higher score on the item translated to a positive attitude towards intellectual activities, and conversely the other eight items were expressed such that a high score indicated a negative attitude towards intellectual activities. The possible range in scores is from 20 = Low need for intellection, to 100 = High need for intellection. As there is no measurement or published data available on the Need for Intellection scale, it will be compared to its predecessor the Student Anti-Intellectualism Scale (SAIS; Eigenberger & Sealander, 2001).

The development of the NFI scale is an adaptation of the SAIS. According to Eigenberger and Sealander (2001) the scale aims to measure a general lack of interest in intellectual pursuits as well as placing importance on "practicality, material commerce, and expedience, while diminishing the import on introspection, analysis, and critical thinking" (p. 388). The SAIS was found to have a reliable internal structure ($\alpha = .91$) and a test-retest reliability of .93 over an 11 week period. In addition, Eigenberger and Sealander demonstrated the discriminant and convergent validity of the 20 items through its comparison to a number of established measures. The Openness to Experience scale from the revised NEO Personality Inventory (Costa & McCrae, 1992) related negatively to the SAIS. In addition the SAIS was also shown to have positive correlations with authoritarian and dogmatism constructs (Altemeyer, 1996), and negative associations with a measure of critical thinking (Facione, 1990), as well as a learning style comprised of deep and elaborate processing (Schmeck, Ribich, & Ramanaiah, 1977).

Given the above findings, it was decided that the present study would use the newly devised NFI scale (Eigenberger, et al., 2010) to measure attitudes towards intellectual activities. The interpretation of the used measure is not one of relating it to a personality construct, but looking at degrees of favour or disfavour towards intellectual activities. The following analyses have used the positive items from the NFI scale. The entire scale is presented in Appendix B1.

7.2.2.4 Schwartz Value Scale – Conservation Values

Values were measured by the Schwartz Value Scale (SVS; Schwartz, 1992) which evaluates how much of a guiding principle a discrete value is in their life. Participants were asked to respond on a nine-point scale (7=of supreme importance;

6=very important; 5,4, were unlabeled; 3=important; 2,1, were unlabeled ; 0=not important; -1= opposed to my values) to how much of a guiding principle in their life each of the 56 values were. These values are based on the analysis of motivational goals to make up a grouping of 10 higher order values (e.g., Stimulation, Self-Direction, Security, Conformity, and Tradition) that are categorised into two bipolar conceptual dimensions (i.e., Self Enhancement and Self Transcendence; Openness to Change and Conservation) as shown in Figure 2.2.

Schwartz (1992, 1996) conceptualised a circular arrangement of values, and as such a set of dynamic relations amongst the higher order value types that described a compatibility or incompatibility if simultaneously pursued. If values are viewed as motivational goals, their realisation can serve the interests of the individual or collective (Schwartz, 1992). Importantly, the pursuits of these values are in opposition to each other. As such, values that are adjacent to each other in the circular arrangement are most positively associated with each other and this positive association reduces the further one goes around the circular structure. For example, self-restraint and submission (tradition and conformity) appeared in adjacent regions in almost all cultures, implying an almost universal structure of value pursuit across cultures. Furthermore, conflicts in the attainment of values occur when they are diametrically opposed on the two bipolar conceptual dimensions. As such, higher order values of stimulation and self direction (Openness to Change) are in opposition to security, conformity, and tradition values (Conservation).

The ten higher order values, which come under the umbrella of the value dimensions are: a) Self Enhancement, which comprises of Power, Achievement, and Hedonism that overlaps with; b) Openness to Change, which consists of Stimulation, and Self-Direction; c) Self-Transcendence, which is made up of Universalism, and Benevolence; d) Conservation, which consists of Conformity, Tradition, and Security values.

The present study was interested in the value dimension of Conservation, which is made up of the higher order values of Security, Conformity, and Tradition. Item response tendencies were corrected by centering responses around each individual's overall mean response to all 56 items (Schwartz, 1992). As Schwartz has reported in the past, low reliabilities reflect the small number of items per higher order value in the SVS. The Chronbach's alpha for the three higher order values

were .48 (Tradition), .58 (Security), and .72 (Conformity), with the dimension of Conservation being .78.

To examine the validity of the value dimension, Conservation was correlated against the other independent variables. Conservation significantly correlated with the Favour Fall component of the Attitudes towards Tall Poppies Scale (r = -.11, p < .05) and Need for Intellection Scale (r = -.33, p < .01). This suggested that persons who valued Conservation goals were significantly less likely to favour the fall of tall poppies and also significantly less likely seek intellectual stimulation, when compared to persons who favoured did not value Conservation goals as much. Moreover, Conservation was significantly and negatively correlated with the diametrically opposed goal of Openness to Change (r = -.50, p < .01), thus supporting the expected theoretical relationship between these two conceptual dimensions (see Appendix B2 for more analyses).

7.2.3 Procedure

The data were from a previous study (Critchley, 2008) and collected in two phases. Data was obtained at two times from an initial telephone interview, and then a follow-up survey given to those who agreed to partake in further research. A representative sample of 1208 Australians over the age of 18 participated in the initial telephone interview via a computer assisted telephone interviewing facility in May 2004. Participants were recruited at random from all Australian phone numbers, and asked if they would like to participate in social research on attitudes towards stem cell research. The broader study by Critchley (2008) investigated public perception of scientists working in stem cell research, looking at the effects of three different contextual descriptions (public, private, control) on the attitudes towards these scientists.

Participants whom agreed to a follow-up questionnaire made up the sample for the present research. Eight hundred and seventy-three participants agreed to receive the follow-up survey after the initial phone call. The response rate for surveys returned was 55.44%. Of the 484 returned surveys, 458 were used for analyses as the other 26 were either incomplete or only partially filled out.

7.3 Results

Data were analysed using SPSS for Windows (version 14) and Amos (version 6). In order to maximise the amount of available data, missing values were inserted using multivariate regression imputation. For example, missing values from the Values Scales were regressed from existing values. Tabachnick and Fidel (Tabachnick & Fidell, 2007) recommend this method of data imputation where no more than 30% of values are missing from one scale. In addition, this form of regression imputation has been found to be valid and reliable (Hawthorne & Elliott, 2005). Eighteen cases were removed from the dataset as several scales were missing more than 30% of values. Data screening revealed no univariate outliers, yet multivariate outliers represented by all independent variables were present. These cases were deleted from the sample, which enabled the data to satisfy the assumptions of linearity, normality, homoscedasticity, independence, and non-multicollinearity. An analysis to check for order effects was carried out, and is presented in Appendix B3. Overall there were no indications of a presentation order effect of the independent variables on attitudes towards scientists

7.3.1 Manipulation check

A manipulation check was carried out to check if participants believed that the scientists were in fact tall poppies. Participants rated the scientist on a 7-point semantic differential item (1 = Low achiever, 7 = High Achiever). The results from the manipulation check show that the scientist was rated above the midpoint on being a *High Achiever* ($M = 5.97$, $SD = 1.02$, $N = 470$). As such, the results suggested that the scientist was perceived as a high achiever, and thus argued to be a tall poppy.

7.3.2 Exploratory and Confirmatory Factor Analyses

An initial series of Exploratory Factor Analyses (EFAs) and Confirmatory Factor Analyses (CFAs) were conducted to test the structure of the dependent variable, attitude towards scientists. The EFAs and CFAs were modelled on previous research carried out by Feather and colleagues that had consistently found two factors by which people evaluated high achievers (Feather, 1989a; Feather, 1993c,

1993d; Feather & McKee, 1992; Feather, et al., 1991). As such, the aim of these analyses was twofold. Firstly it was intended to replicate the factor structure by Feather and colleagues in their studies looking at attitudes towards tall poppies. Secondly, if it were not possible to replicate the factor structure of the attitudes it would be expected that there would be a single parsimonious attitude measure to represent attitudes towards scientists. The details of these analyses are presented in Appendix B2**.** Essentially, after a series of unsatisfactory EFAs and CFAs exploring the possibility of a two factor solution representing attitudes towards scientists in line with the research by Feather (Feather, 1989a; Feather, 1993c, 1993d; Feather & McKee, 1992; Feather, et al., 1991), it was decided that in line with Study 1 to use a single factor solution comprising of 10 attitude items, as seen in Table 7.5.

7.3.3 Descriptives

The sample means and standard deviations for all items in the attitudes towards scientists scale (α = .78) are presented below in Table 7.5.

Table 7.5

Means and Standard Deviations for all Attitudes Towards Scientists Items

Items	*M*	*SD*
Friendly	4.77	1.08
Trustworthy	4.66	1.56
Pleasant	4.94	1.12
High integrity	5.47	1.07
Follows the rules	4.29	1.62
Unassuming	3.51	1.17
In touch	3.80	1.31
Quiet achiever	4.68	1.37
Concerned for Others	4.67	1.13
Polite	4.77	1.08
Total	4.53	(.65)

Note: N = 466.

As indicated by the results in Table 7.5, Scientists were on the whole perceived positively given they score above the midpoint of 4 on almost all characteristics. The exceptions were that they were thought to be slightly more Arrogant and Out of touch with the average person as they were below the midpoint for those two characteristics. Notably, scientists are rated highly on the characteristic of Pleasantness, Quiet achiever, and High Integrity. Furthermore, when participants were asked to rate whether scientists as High Achievers on a scale of 1 - 7, they were evaluated as being quite the High Achiever ($M = 5.95$, $SD = 1.06$). These preliminary analyses indicate that scientists are evaluated positively, and thought of as high achievers. The descriptives of the independent variables and possible covariates are presented below in Table 7.6.

Table 7.6

Means and Standard Deviations for all Independent Variables

Items	*M*	*(SD)*	*Reliability*	*Theoretical Range*
Tall Poppies Scale Total	4.61	.58	.70	1 (FR) – 6 (FF)
Favour Fall (FF)	3.60	1.04	.81	1 (Low) – 6 (High)
Favour Reward (FR)	2.39	.53	.53	1 (Low) – 6 (High)
Need for Intellection Total	3.10	.66	.93	1 (Low) – 5 (High)
Conservation	4.52	.51	.78	-1 – 7 [a]
Security	5.21	.98	.58	-1 – 7 [a]
Tradition Maintenance	5.05	1.21	.72	-1 – 7 [a]
Conformity	4.03	1.24	.48	-1 – 7 [a]

Notes: $N = 466$.
Range[a]: 7 = of supreme importance; 6 = very important; 5,4, were unlabeled; 3 = important; 2,1, were unlabeled ; 0 = not important; -1 = opposed to my values)

As seen in Table 7.6, the sample was above the midpoint on favouring the fall of a tall poppy, and below the midpoint in rewarding tall poppies. This was reflected in their general attitude towards tall poppies (the average of the two scales, after reversing the FR scale), as the sample generally provided a negative view towards these high achievers and persons of status. Overall the reliabilities for the Tall Poppies Scale were adequate, apart from the Favour Reward subscale. Ratings

were around the midpoint for Need for Intellection, and generally above the midpoint of three for Values (with the exception of Conformity which was around the midpoint) suggesting that the overall sample placed a higher importance on Conservation values. In order to test the suitability of possible covariates, a correlation matrix of demographic information alongside independent and dependent variables is presented in Table 7.7.

Table 7.7

Correlations for all Variables and Possible Covariates

Measures	TPS FR	TPS FF	TPS Total	NFI Total	Cons to Open	DOB	Gender	University [b]
Attitudes	-.07	.22*	.24**	.13**	.00	.11*	-.03	-.12**
TPS FR		.03	-.43**	-.05	-.05	-.02	.02	.04
TPS FF			.89**	.20**	-.11*	.01	-.12**	-.21**
TPS Total				.20**	-.08	.02	-.11**	-.21**
NFI Total					-.33**	.05	.04	-.30**
Conservation						-.11*	.11*	.32**
DOB							.02	.02
Gender [a]								-.04

Notes: ***N*** = 466. [a]***N*** = 462. [b]***N*** = 460.

TPS = Tall Poppy Scale, FF = Favour Fall, FR = Favour Reward, NFI = Need for Intellection, DOB = Decade of birth.

Gender, 1=female, 2=male. University = University Study, 1 = yes, 2 = no.

**$p < .01$ *$p < .05$

There are numerous significant correlations presented in Table 7.7, and the following section will focus only on the significant relationships. Further evidence for the suitability of the Favour Fall subscale as compared to the Favour Reward subscale of the Generalised Attitudes towards Tall Poppies Scale was shown. The Favour Reward subscale did not correlate with any of the other demographic, independent or dependent variables and as such it was decided that the Favour Fall subscale was a more suitable indicator of attitudes towards Tall Poppies.

Secondly, it can be seen that Attitudes towards Scientists was positively correlated with both the Favour Fall of Tall Poppies and Need for Intellection; such that, participants who favoured the fall of a tall poppy or who reported a higher need for intellection were also more likely to rate scientists positively. In addition, it can be seen that the favour fall of a tall poppy and Need for Intellection are positively correlated, such that those who have a higher Need for Intellection are also more likely to Favour the Fall of Tall Poppies.

Thirdly, the correlations between Need for Intellection and values showed that those who favoured intellectual activities were significantly likely to value Conservation goals as more important when compared with those higher on Need for Intellection. Thus, those who expressed more interest in intellectual activities were also significantly less likely to rate the restraint of actions, inclinations, and impulses likely to upset of harm others and violate social expectations or norms.

Finally, examining the correlations with demographic variables from Table 7.7 it can be seen that older participants are also more likely to have favourable attitudes towards scientists. Whilst there is no significant relationship between gender and attitudes towards scientists, gender is significantly related to the Favour Fall of Tall Poppies such that female participants were more likely to Favour the Fall of Tall Poppies when compared with males. Furthermore, participants who reported attending a university at some stage were more likely to Favour the Fall of Tall Poppies, and report a higher Need for Intellection.

7.3.4 Structural Equation Modeling

Structural Equation Modeling was used to test the hypotheses outlined in section 7.1. It is a powerful technique in that it is able to test a set of hypotheses simultaneously relating to observed variables and their direct and indirect relationships between unobserved theoretical constructs (Bollen, 1989; Jöreskog & Sörbom, 1988). A model can consist of latent dependent variables (i.e., endogenous), latent independent variables (i.e., exogenous), as well as observed measures and the paths between all these constructs. The regression path (β) reflects the unidirectional influence to the endogenous latent variable, whilst the path from the latent to the observed variable is the amount of variance in the measured variable that is explained by the latent variable (λ). Multivariate normality can be assessed by examining Mardia's coefficient (Mardia, 1970, 1974). Goodness of fit was established with the asymptotically distribution-free criterion method which adjusts the χ^2 statistic and standard errors for non-normality (Browne, 1982), as well as the Incremental Fit Index (IFI; Bollen, 1989), Comparative Fit Index (CFI; Bentler, 1988), Goodness of Fit Index (GFI; Bentler, 1983; Tanaka & Huba, 1989) and the Root-Mean-Square Error of Approximation (RMSEA; Browne & Cudeck, 1993)

Path analysis was conducted using measured variables to test the hypotheses associated with the first study. The theoretical model in Figure 7.1 depicts the manner in which *Values*, *University Attendance*, *Favour Fall of Tall Poppies*, and *Need for Intellection* should influence attitudes towards scientists. *Conservation* was treated as a latent construct, with the underlying measured variables of *Security*, *Tradition*, and *Conformity*. The theoretical model was presented in Figure 7.1.

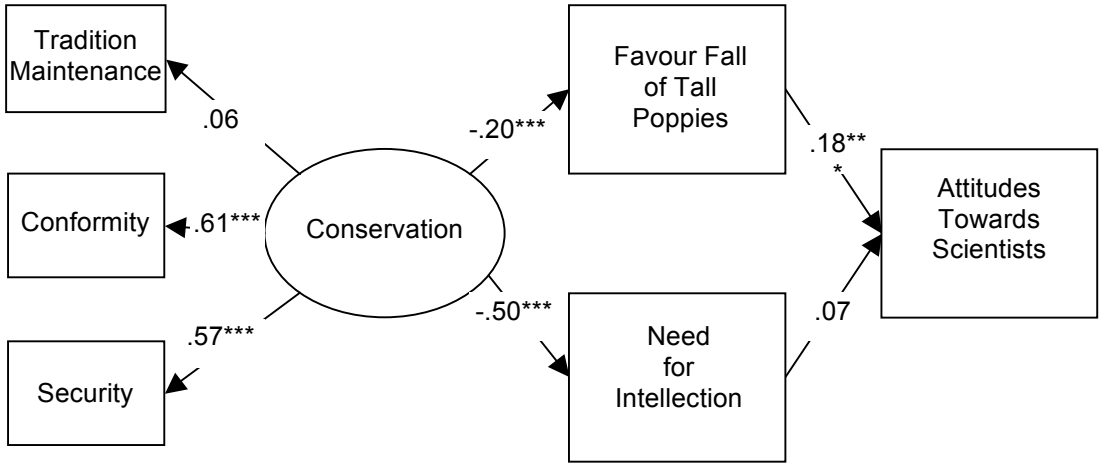

Figure 7.2. Initial Path analysis model predicting Attitudes Towards Scientists.

Notes: Error terms for the measurement model were not included for clarity but can be obtained by the formula $1-\lambda^2$.

***$p < .001$

The original model presented in Figure 7.2, which estimated 15 parameters with 462 cases was not found to be a good fit with the data ($\chi^2 = 28.55$, $df = 8$, $p < .001$, *GFI* = .98, *IFI* = .81, *CFI* = .79, *RMSEA* = .08 [90% CI .05 - .11]). *Conformity* and *Security* were most representative of the latent construct of *Conservation* values which had a standardised indirect effect of $\lambda = .07$ on *Attitudes towards Scientists*.

Given the results from the correlations presented in Table 7.7 indicated a relationship between university attendance and some of the independent variables, it was decided post-hoc to add *University Attendance* into the theoretical model. That is, it would be expected that those who were higher on *Conservation* values would be less likely to have attended university given that university provides an environment for learning and new ideas which is more commensurable with the goal of Openness to Change. Furthermore, those who attended university might also be more likely to favour the fall of tall poppies when compared to those who did not attend, given that persons attending university might be more likely to value Equalitarian ideals and as such would want to see high achievers brought back a notch to a level field. Thus, *University Attendance* was added to the model in between the path from *Values* to the *Favour Fall of Tall Poppies*, and this is presented in Figure 7.3.

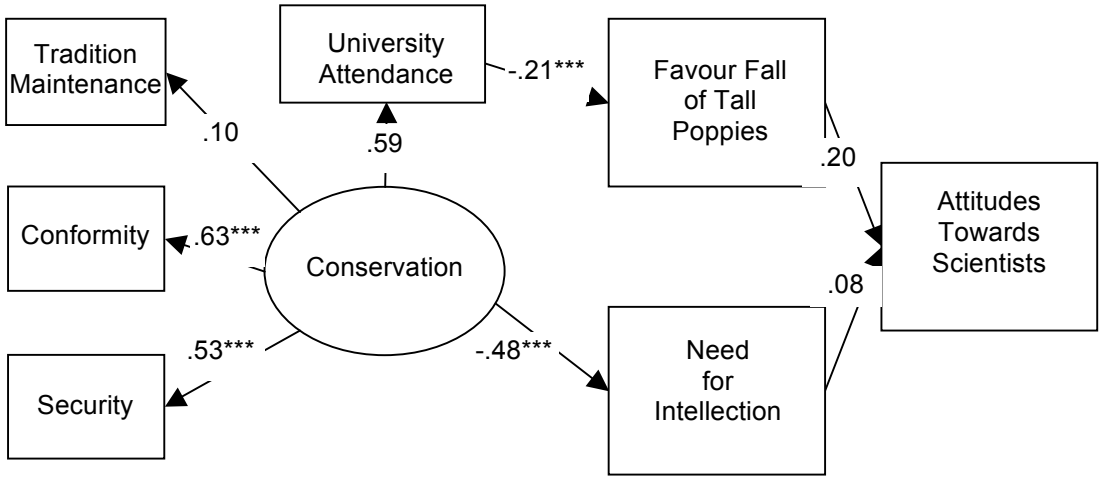

Figure 7.3. Second model predicting Attitudes Towards Scientists.

Notes: 1 = University attendance, 2 = no University attendance. Error terms for the measurement model were not included for clarity but can be obtained by the formula $1-\lambda^2$.

*$p < .05$, ***$p < .001$,

The second model, which estimated 15 parameters with 462 cases was found to be a good fit with the data ($\chi^2 = 36.01$, $df = 13$, $p < .01$, *GFI* = .99, *IFI* = .87, *CFI* = .86, *RMSEA* = .06 [90% CI .04 - .09]). *Conservation* values had a standardised indirect effect of $\lambda = .12$ on *Favour Fall of Tall Poppies*, and $\lambda = .06$ on *Attitudes towards Scientists*. *University Attendance* had an indirect effect of $\lambda = .04$ on *Attitudes towards Scientists*. Modification Indices (Jöreskog & Sörbom, 1988) suggested a direct relationship between the *Need for Intellection Scale* and *Favour Fall of Tall Poppies* ($\chi^2 = 9.28$, $p < .01$). This was theoretically sound, as those who were more positive towards intellectual activities were also more likely to call for the removal of tall poppies from their position. Again, this link was in line with the relationship between *University Attendance*, *Favour Fall of Tall Poppies* and *Need for Intellection.* Changes were made in accordance with the MI, and the final model is presented below as Figure 7.4.

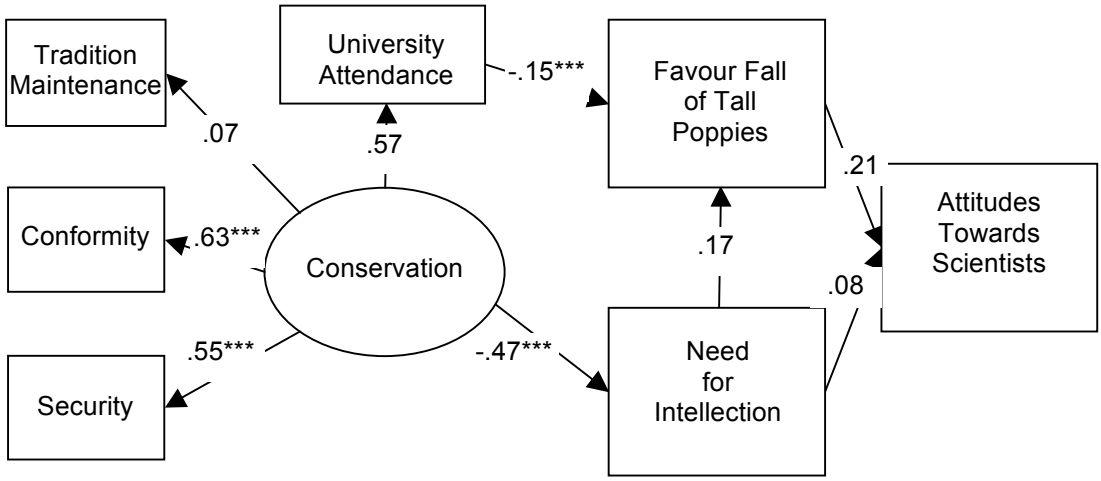

Figure 7.4. Final model predicting Attitudes Towards Scientists.

Notes: 1 = University attendance, 2 = no University attendance. Error terms for the measurement model were not included for clarity but can be obtained by the formula $1-\lambda^2$.

*$p < .05$, **$p < .01$, ***$p < .001$,

Overall the final model predicted that attitudes towards scientists was a good fit with the data ($\chi^2 = 24.48$, $df = 12$, $p < .05$, *GFI* = .99, *IFI* = .93, *CFI* = .93, *RMSEA* = .05 [90% CI .02 - .07]). It showed that attitudes towards scientists were not as strongly related to *Need for Intellection* when compared to *Favour Fall of Tall Poppies*. This meant that those who favoured the fall of tall poppies also evaluated scientists more positively on their personal and moral characteristics ($\lambda = .20$). Whilst *Need for Intellection* did significantly predict attitudes towards scientists, its relationship was weak ($\lambda = .08$). Whilst not proposed in the theoretical model, *Need for Intellection* also significantly and positively predicted the *Favour Fall of Tall Poppies*, such that those who had positive attitudes towards intellectual activities also supported the removal of tall poppies from their position of status.

Participants with higher levels of *Conservation values* were significantly less likely to express a *Need for Intellection* ($\lambda = .47$). Also, those who expressed a higher Conservative values were significantly less likely to have attended university ($\lambda = .57$) when compared with those with lower Conservation values. This provided support for the hypothesis that conservative values would influence judgements of scientists directly and indirectly through their effect on anti-intellectual attitudes. Finally, the ancillary hypothesis that those who attended university were more likely to *Favour the Fall of Tall Poppies* ($\lambda = .16$) when compared to those who did not attend university was supported

Indirect effects (IE) or mediations between the variables were stronger in the final model when compared to the first and second models. *Conservation* had a standardised effect on *Favour Fall of Tall Poppies* IE = .47, and *Attitudes towards Scientists* IE = .17. Indirect effects on Attitudes towards scientists from *University attendance* and Need for Intellection were IE = .03 and IE = .04, respectively. Overall these mediations demonstrate the interrelationships between Values, *University attendance*, *Need for Intellection*, and attitudes towards tall poppies on *Attitudes towards Scientists*. Specifically, they show how Values inform *Need for Intellection*, which in turn predicts attitudes towards scientists.

7.3.5 Additional analyses

In order to investigate the somewhat weak relationship between *Need for Intellection* and *Attitudes towards Scientists* when compared to the stronger path from *Favour Fall of Tall Poppies* (see Figure 7.4), correlations were calculated between individual attitude items and the respective scales. This was done to investigate the attitudinal qualities that may correlate differently with *Need for Intellection* as compared to the *Favour Fall of Tall Poppies*. The results from the analysis are presented below in Table 7.8.

Table 7.8

Correlations between all Attitudes Towards Scientists Items Need for Intellection and Favour Fall of Tall Poppies scales

Attitude Items	NFI	Favour Fall
Friendly	.10*	.11*
Trustworthy	.05	.10*
Pleasant	.10*	.15**
High integrity	.03	.17**
Bends the rules	.07	.10*
Unassuming	-.01	-.13**
In touch	.15**	.20**
Quiet achiever	.05	.17**
Concerned for Others	.06	.19**
Total	.13**	.22**

Note: $N = 466$.

NFI = Need for Intellection.

*$p < .05$, **$p < .01$

As seen from Table 7.8 Need for Intellection did not correlate significantly with the majority of the attitude items, whilst the Favour Fall subscale of the Tall Poppy Scale did. Those who had positive attitudes towards intellectual activities also rated the scientist as significantly more friendly, more pleasant, and In touch with others when compared to those who did not have positive attitudes towards intellectual pursuits. In contrast, when participants favoured the fall of tall poppies they also rated scientists favourably across every personality characteristic, with the exception of rating them as more arrogant than unassuming, when compared to those who did not favour the fall of tall poppies.

7.4 Discussion

The second study of this thesis provided some support for the hypotheses, some of which were exploratory. Firstly, it was found that the favour fall component of the generalised attitudes towards tall poppies was a stronger predictor of attitudes towards

scientists when compared with anti-intellectual attitudes. Secondly, the hypotheses relating to values were supported. Namely, Conservation values did indeed predict anti-intellectual attitudes, such that those who were lower on Conservation values indicated positive attitudes towards intellectual activities and in turn were favourable towards scientists. It was also found that the hypotheses relating to demographic variables were also supported, with significant relationship between university attendance and anti-intellectual attitudes, favour fall of tall poppies, and values.

The main hypothesis of this study was exploratory in testing a model to examine which predictor, generalised attitudes towards tall poppies or attitudes towards intellectual activities, would better predict attitudes towards scientists. Results indicated that there was only a weak contribution from attitudes towards intellectual activities in the prediction of attitudes towards scientists when compared to the path from favour fall attitudes. These two predictors of attitudes towards scientists were influenced by underlying value structures relating to Conservation motivational goals directly or indirectly by whether a person had attended university. These results were in the opposite direction to Feather (1994a) who found that favour fall of tall poppies was negatively correlated with the positive rating of personality characteristics in tall poppies. Study 2 showed that favour fall was a significant and positive predictor of attitudes towards scientists.

This finding lends support to the results from Study 1 in this thesis that persons classified as intellectuals, such as scientists, are seen to be deserving of maintaining their achieved position. Understood in these terms, it is plausible that those who favour the fall of tall poppies from their positions of status and achievement, positions attained through actions which are not valued as deserved, do not view scientists in the same way described by these general attitudes towards tall poppies. From Study 1 it was found that scientists are more likely to be viewed as achieving their success through internally attributed behaviours such as hard work and effort, and thus deserving of their success and maintaining their position – qualities that could make them immune from the tall poppy syndrome. It is this resilience related to judgements of deservingness that distinguishes persons such as scientists from other tall poppies.

On the other hand, the influence of attitudes towards intellectual activities on attitudes towards scientists was not as strong as attitudes favouring the fall of tall poppies. It was predicted that attitudes regarding the preference for intellectual

activities would have had a significant impact on attitudes towards scientists. Even though there was a small positive significant relationship, indicating that those who valued intellectual pursuits were also more likely to rate scientists more favourably on a host of personality and moral characteristics and vice versa, this link was very weak and further investigations indicated possible reasons for this. More detailed analyses showed that whilst individual personality and moral descriptions correlated well with generalised attitudes towards the favour fall of tall poppies, the same was not found with attitudes relating to Need for Intellection.

In fact Need for Intellection only significantly correlated with a third of the items, as compared to Favour Fall that correlated with all the personality and moral characteristics of scientists. A person's preference for learning and life of the mind was not strongly indicative of their attitude towards scientists in general. So, it may be more about how deserving the scientist was of attaining and maintaining their position, rather than perceptions relating to the moral character of the scientist and thus valuing what they do. Although it was hypothesised that the relationship should be stronger, this unexpected result could be explained by the lack of information given about the scientist and the importance of the role of context when making such a judgement. This will be detailed later on, after an analysis into the role of values as precursors to judgments about the favour fall of tall poppies, attitudes about intellectual activities, and the prediction of attitudes towards scientists.

As predicted, the values were significant in predicting Need for Intellection attitudes, which in turn predicted attitudes towards scientists. Specifically, a person's Conservative values predicted a lack of preference for intellectual pursuits, such that those who did not favour goals relating to Conservation were significantly more likely to be positive toward intellectual endeavours such as exploration of ideas, expression of creativity, and the life of the mind. In particular, aspects relating to Conformity (i.e., restraint of actions and impulses likely to upset or harm others and violate social expectations or norms) and Security (i.e., safety, harmony, and stability of society, of relationships, and of self) were more stronger factors of the latent construct of Conservation, whilst tradition (i.e., respect, commitment, and acceptance of the customs and ideas that traditional culture or religion provide for the self) was not a significant factor. Finally, persons lower on Conservation and with a high need for intellection were also significantly more likely to view scientists as positive (e.g.,

friendly, trustworthy, pleasant) when compared with those lower on need for intellection who were also high on Conservation.

Interestingly, due to the suggested model changes, Need for Intellection was a significant and positive predictor of Favour Fall attitudes towards Tall Poppies. Whilst this relationship was not hypothesised, it complemented and challenged extant research (Feather, 1989a). Feather found that persons who rated Tradition Maintenance values as important also favoured the fall of tall poppies. Although there was no direct prediction between Values and Favour Fall of Tall Poppies, the indirect path through Need for Intellection challenges that finding. It suggests that persons who value Conservation values are less likely to also endorse the removal of tall poppies from their position of achievement or status.

Similarly, the final model also predicted that persons who attend university are significantly more likely to favour the fall of tall poppies when compared to those who do not attend university. Not surprisingly and supporting research where epistemic preference was related to university attendance (Eigenberger, et al., 2007), university attendees were also more likely to indicate a preference for intellectual learning and exploration when compared with non-attendees. Finally, those with higher Conservation values were less likely to attend university when compared with persons who expressed lower Conservation values. Overall, this finding suggested the connectedness and origin of Values with attitudes relating to intellectualism and the favour fall of tall poppies, as well as university attendance.

Like the results from Study 1, the effect of Favour Fall on Attitudes towards Scientists could have been due to salient cues derived from the items about scientists. For example, when asked to rate scientists on the different moral and personality descriptors, participants could have activated a stereotype about a hard working scientist who had done several years of training and study. In turn, this may have influenced their ratings on the favour fall scale of the generalised attitudes towards tall poppies. That is, they may have compared and thought of the scientist as deserving of their success in comparison to how deserving tall poppies were to maintain their present position. On the other hand, it is also plausible that scientists are not the same as other tall poppies, and this would explain why the findings follow the trend of those from Study 1 where favouring the fall of tall poppies was significantly related to the positive evaluation of scientists.

The primary aim of this study was to determine whether intellectuals (i.e., scientists) were susceptible to the same evaluations processes as other tall poppies, and thus if they were tall poppies. On one hand, the results from the path analysis seem to suggest that scientists are quite distinct from tall poppies given the reverse effect as compared to traditional tall poppies as investigated by Feather (1994a). People seem to be more likely to level the playing field and bring down traditional tall poppies from their positions of status and achievement when they are deemed not deserving of maintaining their present position. However, scientists whom are seen to be deserving of their success (see Study 1) could be immune from the tall poppy syndrome, as participants may hold information about the scientist's achievement of their success salient when making judgements about their personality and moral characteristics.

The present study only investigated the attitude towards a scientist where no information was given about the context, or the person carrying out the research. Feather and colleagues did find that personal responsibility of the tall poppy, and whether or not positively valued success or negatively valued failure follows from behaviours that were positively or negatively valued, were instrumental in judgements of deservingness and thus level of favourability towards that tall poppy (Feather, 1993d; Feather, et al., 1991). An assumption in the present research was that beliefs about stereotypical attributes of a group of people lead to the evaluation of that person, and thus represent an attitude towards them. As no information was provided in this study about the scientist, participants would have relied on stereotypes to make evaluations about the scientist's personality and moral characteristics, rather than being informed by descriptions about the intentions, motivations, or context.

From the limited research on perceptions of scientists, it is known that the stereotype portrayed by the media is often one ranges between descriptions of dull and socially aloof scientists (Mead & Métraux, 1957), arrogant researchers who are a threat to human nature due to their quest for knowledge in secrecy (Weingart, et al., 2003), to heroic, un-objective, emotional, engaged with society type scientists (Jones, 2001). The participants in Study 2 of this thesis had no unified image to draw from, and it is a limitation of the results that their notions and judgements of *scientist* could have differed amongst these common stereotypes. In addition, as there was also no information given about the setting in which the scientist worked in, participants would have needed to rely on schemas about scientific research.

One of the repeated findings by Critchley and colleagues (Critchley, 2008; Critchley & Turney, 2004; Gilding & Critchley, 2003) is the importance of context in the perception of science and scientists. Whether it be the type of research (e.g., stem cell research, genetically modified foods), the institution in which the research is carried out (e.g., university, private institution), or the motives behind the research (e.g., public funding, private funding), all of these contextual pieces of information influence the perception of science and scientists, particularly for complex research where people rely on heuristics rather than knowledge about science. In addition, Critchley (2008) also documented the importance of personality and moral characteristics such as competence and self-interest in the judgement of the scientist, especially those working in complex technologies. Thus, whilst the results were informative about what factors influence attitudes towards scientists in general, it would be hasty to dismiss the role of some of the lesser influential factors (i.e., Need for Intellection) in the role of attitude formation towards scientists, without examining the influence of contextual information on attitudes towards different scientists.

The findings from this study provided support for a model predicting attitudes towards science based on Conservative values, a Need for Intellection, and attitudes supporting the removal of tall poppies from their positions. Further research detailed in Study 3 of this thesis will look at the impact of the scientific context that the scientist is working in, and also the motivations of scientist. Whilst there is direct research to support the importance of context in the judgements of science (e.g., Critchley, 2008; Critchley & Turney, 2004), the perceived level of intellectuality in the scientist is expected to influence attitudes towards that scientist.

Hofstadter (1963) wrote about the *Mental Technician*, somewhat of a pragmatic pseudo intellectual, that uses his or her skills as an instrument to pursue the endpoint of a fixed problem as compared to the intellectual who speculates, wields fresh observation, creative novelty, and radical criticism in the pursuit of knowledge. In accordance with social comparison theory (e.g., Salovey, et al., 1991; Tesser, et al., 1991), it might be expected that attitudes towards intellectual activities (i.e., Need for Intellection) could influence the perception of a scientist depending on the scientist's level of intellectuality. Combined with the investigation into context on the perception of scientists, research in Study 3 will extend Feather's research (1994a) into tall poppy attitudes by both addressing the effects of contextual information and

the role of the individual difference intellectuality on the perception of intellectual high achievers (i.e., scientists).

In conclusion, Study 2 aimed to examine whether scientists were tall poppies by testing a model with paths contrasting values and intellectual attitudes against general attitudes towards tall poppies. Results suggested that attitudes towards scientists in general were a product of values and level of favour towards intellectual activities, but were more so related to judgements concerning how deserving tall poppies were of maintaining their present position. Furthermore, the results once again distinguished scientists (i.e., intellectual high achievers) from other traditional tall poppies, indicating that they were not likely to succumb to the tall poppy syndrome. However, as part of further research in this thesis, individual differences in levels of intellectuality and contextual information will be examined to further detail why persons may be unfavourable towards emerging technologies and the high achievers that work in them.

CHAPTER 8

STUDY THREE: HOW DOES INTELLECTUALITY AND CONTEXT INFLUENCE ATTITUDES TOWARDS SCIENTISTS ?

8.1 Overview of the Chapter and Introduction

The final study in the current thesis investigated the effects of context and level of intellectuality on the perception of tall poppies working in emerging technologies by measuring attitudes towards different kinds of scientists that were described in vignettes. Specifically, the study examined the effect of personal values and anti-intellectualism on attitudes towards scientists, as well as the differences in attitudes across scientific context and intellectuality in the scientist. Generally speaking, it was expected that there would be differences in attitude ratings across context, as well as intellectuality type.

In this study the differences in context were exemplified by scientists working in Human Embryonic Stem Cell Research (HESCR) compared to those working in Nanotechnology. These two applications of science were chosen as they are considered to be human enhancing technologies; that is, applications of science and technology to expand human capacity (Williams, 2006). The rationale for these examples is that scientists described as working in HESCR may be perceived as meddling in established traditional beliefs through an attempt to control nature (Boulter, 1999). Furthermore, anti-intellectual attitudes and pro-conservative values have been found to oppose HESCR (Critchley & Turney, 2004). As such, it was expected that those favourable towards intellectual activities or those with lower conservative values, would be more likely to favour scientists in general when compared with persons who value conservative values or disregard the life of the mind.

Nanotechnology was argued to be less morally contentious when compared to HESCR in line with findings from the Eurobarometer survey (European Commission, 2005), yet it is still a comparatively elaborate emerging technology with equally complex scientific applications. As such, it was predicted that attitudes towards scientists working in Nanotechnology, a technology not expected to evoke an ego-

defense against conservative values, would be more favourable when compared to scientists working in HESCR. Thus, whilst Nanotechnology is a complex emerging technology with multifarious applications of its research (e.g., HESCR), attitudes towards scientists carrying out the research should not be driven by similar motives.

Finally, it was hypothesised that attitudes towards scientists who were described as intellectual would be more favourable when compared to attitudes towards those described as pragmatic. The rationale is that tall poppies that are seen to be deserving are generally viewed more favourably than those who have achieved success through means that are deemed underserved (e.g., luck or opportunity). Thus, it was expected that scientists who are portrayed as being motivated by intellectual needs (i.e., pushing the boundaries of research and critiquing established research) would be seen to be more deserving of their position and status when compared to scientists motivated by lesser intellectual desires (i.e., applying knowledge as a tool to get the job done). In turn, this would lead to the intellectual scientist being rated more favourably when compared with the pragmatic scientist given that the characteristics of an intellectual scientist should be more fitting to those expected for a researchers working in an emerging technology.

8.2 Method

8.2.1 Participants

There were 194 participants (68 males, 126 females) from a Melbourne university sample and the broader community who voluntarily completed a set of measures. The sample ranged from 18 to 61 years of age (M = 24.72 years, SD = 8.39 years), and were recruited either via a snowballing technique (N = 62) or undertook the survey as partial credit for their first year undergraduate course in psychology (N = 131). An additional 25 respondents from the wider community reported being enrolled in study at the time of the questionnaire, such that 80.4% of the sample were currently enrolled in some sort of educational program. As such, the participants were highly educated for the most part, with specific proportions presented in Table 8.1.

Table 8.1
Highest Education Level Achieved

Education level	Frequency (percentage)
Primary	1 (0.4)
Some Secondary	2 (0.7)
Completed Secondary	80 (28.5)
Trade Qualification	4 (1.4)
TAFE or Diploma Level	26 (9.3)
Incomplete Tertiary	67 (23.8)
Complete Tertiary	61 (21.7)
Postgraduate	40 (14.2)

Note: $N = 281$.

In Table 8.1, 69 percent of the participants reported having attempted or achieving higher level degrees, ranging from TAFE or Diploma to Postgraduate. The majority of participants indicated Australia as their place of birth (80.4%), with the remainder having lived in Australia between 2 and 43 years ($M = 17.33$ years, $SD = 10.77$ years). More precisely, the average time (i.e., number of years lived in Australia divided by age in years) spent living in Australia as reported by migrants was circa two thirds of their lives ($M = 64.02\%$, $SD = 30.71\%$). As in Study 1, this was recorded as a possible covariate, which was not found to be significant, given that the tall poppy syndrome is almost exclusively an Australian phenomenon (Feather, 1989a).

8.2.2 Materials

8.2.2.1 Attitudes towards scientists scale

The semantic differential scale used in this study consisted of a series of bipolar adjectives that are on a continuum (see Study 1 for a detailed description of the adapted scale). Participants were asked to rate these word pairs on a 7-point bipolar adjective scale, used in the present study related to scientists in general. For example, people were asked "I think Australian Scientists are …" Unassuming / Arrogant. Items across attitude targets were re-ordered and counterbalanced to minimise

respondent bias and acquiescence. Reliability for the final 10 items ranged from α = .77-.80 (see Appendix C2 for a more detailed analysis).

8.2.2.2 Need for Intellection scale

The Need for Intellection scale (Eigenberger, et al., 2010) was used to assess an individual's attitude towards intellectual activities. See Study 2 (section 7.2.2.3) for a detailed description of the scale.

8.2.2.3 Schwartz Value Scale – Conservation and Openness to Change

Values were measured by the Schwartz Value Scale (Schwartz, 1992) which evaluates how much of a guiding principle a discrete value is in their life. As in Study 2 (see 7.2.2.4), Study 3 focussed on Conservation values. The original motivational goals of Openness to Change and Conservation Values were highly correlated (r = -.96, p < .01), much more so than in Study 2. The Chronbach's alpha for the three higher order values were .78 (Tradition), .70 (Security), and .80 (Conformity), with the dimension of Conservation being .89.

8.2.2.4 Vignettes

Further to the initial exploration of attitudes towards Australian Scientists in Study 1, the scale was again administered in this study to look at the effect of the attribution of certain characteristics to scientists. As such, vignettes were devised to manipulate certain aspects of information about the Australian Scientists, after which participants rated them on the attitudes towards high achievers scale. Participants were each presented with two of a possible four vignettes, and were always presented with one scenario that involved a scientist working in Nanotechnology and another scenario with a scientist working in Human Embryonic Stem Cell Research (HESCR). These were chosen as both technologies are complex, and the applications of the science are recent examples of Human Enhancement technologies (Williams, 2006). This was to ensure that participants any possible order effects based on the non-threatening and threatening scenarios were counterbalanced. The vignettes were prefaced with:

> In the following section, there are two small paragraphs that describe scientists working in an emerging field. Take a moment to read the description of the

> scientist, the field of research that they work in, and their job role. Then proceed to answer a series of items on the following page based on "name" and the scenario.

The two scenarios presented were about Chris or Alex. These names were selected as they were gender neutral, in order to control for any effects of bias towards a particular scientist through identification, attribution of competence, or likeability (Feather, 1989a). The vignettes were manipulated in a 2 x 2 (intellectuality of the scientist x type of science) manner. One of the scenarios described the Australian scientist named Chris, who worked at a biotechnology company named Clone-Drone. The vignettes that describe Chris working at a biotechnology company involved in Human Embryonic Stem Cell Research (HESCR) were the type of science manipulation (see Appendix C1 for the full vignettes). The scientist carrying out the research was also manipulated by changing a few phrases relating to their motivations and interest in the project that related to the level of intellectuality.

The following section will compare and contrast the differences between the vignettes, especially relating to the manipulation relating to the type of science. Italics have been added to highlight where the scenarios differed. The initial statement in the vignette was about the organisation and their work. It sought to distinguish the non-threatening scenario from the threatening scenario by introducing the type of work carried out and its broad applications:

> Alex works at a biotechnology company in Australia called *Mini-Med*. The organisation is a successful start up business that is recognised world wide for its cutting edge research and applications *of nanotechnology in the medical field*. [italics added to emphasise differences between scenarios]

and

> Chris works at a biotechnology company in Australia called *Clone-Drone*. The organisation is a successful start up business that is recognised world wide for its cutting edge research and applications *in embryonic cloning*. [italics added to emphasise differences between scenarios]

Following this, a sentence was used to establish what the research was, and provide a concise definition about it. These statements provided a comparison and a contrast across the type of science:

> Nanotechnology is the process of developing new materials and processes by manipulating molecular and atomic particles. Mini-Med is applying nanotechnology to research and develop smaller power systems for bionic implants and prostheses.

and

> Cloning is the process of making a genetically identical organism through nonsexual means. Clone-Drone is perfecting the process by which a person's DNA is used to grow an embryonic clone from an enucleated egg (i.e., an egg that has had its nucleus removed).

After these sentences, there was a statement about the application of the research which sought to provide the reader with the applications of the research for the Nanotechnology scientist and HESCR scientist respectively:

> These developments will lead to the creation of smaller, lighter, durable, and reliable implants for the use in pacemakers, auditory and visual aids, and in prosthetic limbs (e.g., used to operate the hand, wrist and elbow).

and

> The cells from this clone can be used to grow replacement organs and tissue (e.g., hearts, livers, and skin), as well as enabling the development of neurons for research into treatment of disorders where neuronal death occurs (e.g., Alzheimer's and Parkinson's).

As little information was modified for the type of science manipulation, relating to statements for the scientist working in the threatening scenario (i.e., HESCR), compared to the scientist working in the non-threatening scenario (Nanotechnology). Here, threatening and non-threatening relate to an ego-threat to established norms and traditions encompassed by Conservative ideals.

The only dimension that was changed beyond this was level of intellectuality of the scientist. In this way, only one sentence was different across the intellectuality manipulation, thus keeping all the other information in the vignette constant for a valid comparison. In one scenario Chris was described as a researcher motivated to learn and extend the boundaries of the current ideas in the field of embryonic research, an epitome of an intellectual. In the other, Chris was described as a gifted

scientist, yet also uninterested and indifferent about their work and the outcomes of their research, an example of a pragmatic scientist.

> Chris, the scientist in charge of the project, is interested in expanding and pushing the boundaries of embryonic cloning, continuing the analysis and critique of established techniques to stay at the frontier of this emerging field

and

> Chris, a gifted practical scientist, is only interested in carrying out the tasks on embryonic cloning project and is indifferent about developing or pushing the boundaries of the research.

Similarly, the non-threatening vignettes of Nanotechnology were modified in the same fashion as just described. In total there were four different vignettes that were manipulated in a 2 x 2 (intellectuality x type of science) manner. See Appendix C1 for the full vignettes.

8.2.3 Procedure

The data were collected using a paper and pen questionnaire and an online survey. Participants recruited from undergraduate classes in psychology from a Melbourne university were offered the opportunity to complete a short series of scales in a place of their convenience in exchange for partial course credit. Instructions were provided as how to return the completed questionnaire to a locked collection box on campus, or via post. Persons who completed the questions online were sampled via e-mail snowballing techniques requesting each recipient to pass on the hyperlink to the study on to as many people as possible.

Presentation of attitude targets was also counterbalanced across four different surveys to control for possible ordering effects. After having read each vignette, participants were always presented with two targets. Participants always rated a scientist working in Nanotechnology and one working in HESCR. These scientists were described either as Intellectual or Pragmatic researchers. Finally, there were also different orders across both online and paper and pen surveys to control for any effects of questionnaire type (i.e., online vs. paper and pen) on responses. Two orders of the questionnaires used in Study 3 are presented in Appendix D3 and Appendix D4.

8.3 Results

Data were analysed using SPSS for Windows (version 14) and MlwiN (version 1.10.0007). In order to maximise the amount of available data, missing values were inserted using multivariate regression imputation in no more than 1.03% of the total cases. For example, missing values from the Need for Intellection Scale were regressed from existing values. Tabachnick and Fidel (2007) recommend this method of data imputation where no more than 30% of values are missing from one scale. In addition, this form of regression imputation has also been found to be valid and reliable when data is missing at random (Hawthorne & Elliott, 2005). Data screening revealed no univariate outliers, yet several multivariate outliers were present. These cases were deleted from the sample, allowing the data to satisfy the assumptions of linearity, normality, homoscedasticity, independence, and non-multicollinearity.

8.3.1 Manipulation check

A manipulation check was carried out to check if participants actually believed that the scientists were in fact tall poppies. Asked to think about the four groups of people that they had just rated, participants then marked each target as either Successful or Unsuccessful.

The manipulation check results show that all types of scientists, working in both fields of research were seen to be successful by more than 80 percent of respondents. Scientists working in Nanotechnology were rated as successful by 92.3% and 91.9% of respondents. Those working in HESCR were rated as successful by 91.9% and 94.3% of respondents, for the for the Intellectual and Pragmatic researcher respectively. As such, the results suggested that the scientists described in the vignettes were perceived as successful, and thus argued to be tall poppies.

8.3.2 Exploratory Factor Analyses

Once again, an initial series of Exploratory Factor Analyses (EFAs) were conducted to test the structure of the dependent variable, attitude towards high achievers. The EFAs were modelled on previous research carried out by Feather and colleagues that had consistently found two factors by which people evaluated high achievers (Feather, 1989a; Feather, 1993c, 1993d; Feather & McKee, 1992; Feather, et al., 1991). As

such, the aim of these analyses was threefold. Firstly it was intended to replicate the factor structure by Feather and colleagues in their studies looking at attitudes towards tall poppies. Secondly, if it were not possible to replicate the factor structure of the attitudes so as to obtain a consistent measure across the four high achievers, an examination of other options to create a dependent attitude measure would be undertaken. Finally, it would be expected that there would be a single or multiple parsimonious attitude measure to represent an attitude or attitudes towards each of the four scenarios that would enable a comparison across groups. The details of these analyses are presented in Appendix C2.

The results from Appendix C2 show that previous theoretical groupings (e.g., Feather & McKee, 1992; Feather, et al., 1991) were not found in the present study. These two theoretical factors by which people evaluate tall poppies (e.g., good mixer and self-centred) did not show consistent results across the present contexts of Nanotechnology and HESCR. Subsequent factor analyses were carried out which resulted in single factor solution with 10 items that represented attitudes towards scientists.

8.3.3 Descriptives

A single factor within subjects MANOVA was carried out on all the Dependent Variables in Table 8.2 to test if there were any significant differences in these scores across the 6 versions of the surveys (4 paper and 2 online). The single factor within subjects MANOVA for order found a significant difference in ratings across survey versions (*Wilks* = .82, F (4,185) = 1.84, $p < .05$, $\eta^2 p = .05$). Upon closer inspection, tests of between subjects effects showed that there was only a significant difference across versions for Conservation Values (F (5,188) = 4.78, $p < .01$, $\eta^2 p = .11$). However, there were no significant differences across survey versions for Need for Intellection (F (5,188) = 1.28, $p > .05$, $\eta^2 p = .03$) or its positive (F (5,188) = 1.72, $p > .05$, $\eta^2 p = .04$) and negative subscales (F (5,188) = .83, $p > .05$, $\eta^2 p = .02$), Conservation to Openness (F (5,188) = 2.01, $p > .05$, $\eta^2 p = .05$) as well as Openness to Change values (F (5,188) = .94, $p > .05$, $\eta^2 p = .02$). Given that the only significant difference across the survey versions was for the Conservation Values variable, and not the Conservation to Openness variable that will be used in further analyses, it was decided that this difference did not warrant further attention.

The descriptives for the study variables are presented below in Table 8.2.

Table 8.2
Means and Standard Deviations for the Independent Variables

Items	*M*	*SD*	*Reliability*	*Actual Range*	*Theoretical Range*
NFI Total	3.09	0.67	.93	1.04 – 4.86	1 – 5
NFI Positive	3.08	.74	.91	1.08 -5.00	1 – 5
NFI Negative	2.90	.69	.81	1.14 – 5.00	1 – 5
Conservation	3.66	1.45	.89	.07 – 7.00	-1– 7
Tradition	3.72	1.75	.78	-.60 -7	-1– 7
Security	4.23	1.46	.70	0 - 7	-1– 7
Conformity	4.14	1.70	.80	0 – 7	-1– 7

Notes: $N = 194$.

NFI = Need for Intellection. Range[a]: 7 = of supreme importance; 6 = very important; 5,4, were unlabeled; 3 = important; 2,1, were unlabeled ; 0 = not important; -1 = opposed to my values).

Non integers in Actual Ranges are a result of data imputation for missing values.

As shown in Table 8.2, participants were around the midpoint on the Need for Intellection scale, and just above the midpoint for Conservation values. All scales and subscales demonstrated good reliability coefficients. The positive subscale of the NFI scale was used in further analyses as it showed good reliability, and was a more concise measure than all 20 items in the NFI scale.

Conservation values and Need for Intellection positive subscale were significantly and negatively correlated ($r = -.23$, $p < .01$), indicating that attitudes favouring intellectual activities decreased alongside a reported preference for Conservation values. The final attitude measure for scientists across scenario and intellectuality, as derived from the Factor Analyses presented in Appendix C2, was the sum average of ten items as seen in Table 8.3 and Table 8.4.

Due to the fact that respondents only answered two of the four possible scenarios that resulted in a mixed between and within subjects design, comparisons between high achievers were not made using traditional ANOVA techniques. So, at this point only descriptives for independent and dependent variables are presented. Firstly, as seen in the Table 8.3 item totals, scientists working in Nanotechnology ($M = 4.54$, $SD = .65$) were rated favourably overall, whilst those in HESCR ($M = 4.22$,

SD = .69) were rated moderately. With the exception of one characteristic (Self Control), Nanotechnology scientists were thought of as more positive across all other characteristics when compared with HESCR scientists. However, there are no discernible differences when Intellectuality type is compared, irrespective of context.

Table 8.4
Means and Standard Deviations for all Attitudes Towards Scientists Across Intellectuality

Items / Intellectuality	Intellectual[a]		Pragmatic[b]	
	M	*(SD)*	*M*	*(SD)*
Honest	4.34	(1.13)	4.70	(0.96)
Polite	4.44	(0.91)	4.44	(0.94)
Trustworthy	4.44	(1.18)	4.55	(1.16)
Concerned for others	4.59	(1.31)	4.25	(1.34)
Pleasant	4.12	(1.08)	4.39	(0.99)
Unassuming	3.91	(1.05)	4.06	(1.13)
Self Controlled	4.59	(1.31)	4.25	(1.34)
In touch with average	3.99	(1.04)	3.57	(1.18)
High Integrity	4.16	(1.26)	3.85	(1.26)
Friendly	4.77	(1.28)	4.57	(1.29)
Total	4.34	(0.65)	4.26	(0.70)

Notes: [a]*N* = 96-97 depending on context, [b]*N* = 97-98 depending on context.

Table 8.3
Means and Standard Deviations for all Attitudes Towards Scientists Across Science Type and Intellectuality

Items / Scientist Type	Nanotechnology						Human Embryonic Stem Cell Research					
	Intellectual[a]		Pragmatic[a]		Total[a]		Intellectual[b]		Pragmatic[c]		Total[d]	
	M	*(SD)*	*M*	*(SD)*	*M*	*(SD)*	*M*	*(SD)*	*M*	*(SD)*	*M*	*(SD)*
Honest	4.36	(1.03)	4.81	(1.02)	4.59	(1.05)	4.32	(1.23)	4.59	(0.91)	4.46	(1.08)
Polite	4.65	(0.91)	4.58	(0.96)	4.61	(0.93)	4.22	(0.90)	4.31	(0.92)	4.26	(0.91)
Trustworthy	4.65	(1.18)	4.66	(1.23)	4.65	(1.20)	4.22	(1.17)	4.45	(1.09)	4.34	(1.13)
Concerned for others	4.87	(1.20)	4.53	(1.36)	4.70	(1.29)	4.31	(1.42)	3.97	(1.31)	4.14	(1.38)
Pleasant	4.05	(1.21)	4.49	(0.94)	4.27	(1.10)	4.19	(0.95)	4.30	(1.04)	4.24	(1.00)
Unassuming	4.15	(1.02)	4.05	(1.07)	4.10	(1.05)	3.67	(1.07)	4.07	(1.19)	3.87	(1.15)
Self Controlled	4.91	(1.14)	5.02	(1.09)	3.71	(1.26)	4.43	(1.24)	4.58	(1.13)	3.90	(1.23)
In touch with average	4.60	(1.18)	4.04	(1.18)	3.73	(1.41)	3.71	(1.34)	3.66	(1.34)	3.25	(1.49)
High Integrity	4.97	(1.14)	4.79	(1.31)	4.23	(1.21)	4.56	(1.42)	4.35	(1.28)	3.81	(1.19)
Friendly	4.28	(1.38)	4.42	(0.97)	4.45	(1.18)	4.22	(1.05)	4.34	(1.01)	4.29	(1.25)
Total	4.55	(0.58)	4.54	(0.71)	4.54	(0.65)	4.18	(0.70)	4.26	(0.69)	4.22	(0.69)

Notes: [a]$N = 97$, [b]$N = 98$, [c]$N = 96$, [d]$N = 96$-98.

The data presented in Table 8.4 shows the data from Table 8.3, but is collapsed across level of intellectuality in the scientist. Table 8.4 does not show an overall distinction across scientists based on Intellectuality. However, particular items are somewhat different, with Pragmatic scientists rated as more honest, more pleasant, and less arrogant (more unassuming) when compared with Intellectual scientists. The distinctions between the Intellectual scientists and the Pragmatic scientists were that they were rated as more friendly, more self-controlled, and more in touch with the average person as well as having a higher level of integrity. Furthermore, Intellectual scientists were rated as being more concerned for others when compared to Pragmatic scientists; however this may have been a reflection on the vignette where Pragmatic scientists were described as "only interested in carrying out the embryonic cloning/nanotechnology project".

Additional detail across the four scenarios presented in Table 8.3 show a more detailed analysis of the differences between the intellectuality level of the scientist across scientist types. Looking just at the scientists engaged in Nanotechnology research, there is no immediate differentiation between Intellectuals (M = 4.55, SD = .58) and Pragmatics (M = 4.54, SD = .71). There was a slight difference for the same comparison for scientists engaged in HESCR, with Intellectuals (M = 4.18, SD = .70) being less favoured than Pragmatics (M = 4.26, SD = .69). This result is also reflected in the individual characteristic scores, with the Pragmatic Nanotechnology scientist being rated higher on seven out of ten attitude items when compared to the Intellectual Nanotechnology scientist. Due to sampling methods (i.e., that respondents only answered two of the four scenarios that resulted in a mixed between and within subjects design) these differences cannot be analysed using ANOVA techniques, so the hypotheses were tested using Multilevel Modelling.

8.3.4 Multilevel Modelling

A single repeated measures Multilevel Model was computed using MlwiN version 1.10.0007 (Rasbash, et al., 2001). In this study, two levels of effect on attitudes were examined, the four scientist types and the different participants. Thus, the variance attributable to the Level 1 within group effect in this study gives an indication of how much attitudes vary across target contexts, and the Level 2 between group effect indicates how much attitudes vary across participants.

In this research, the four scenarios were treated as a Level 1 variable due to the nature of the sampling. That is, because attitude measures were taken across four different scenarios (Scientist Type x Intellectuality), each participant was tested at each level of the variable (i.e., attitudes towards Intellectual Nanotechnology or HESCR scientists, and attitudes towards Pragmatic Nanotechnology or HESCR scientists). Also, in order to counterbalance for possible order effects on attitude ratings as well as respondent fatigue due to repeated scenarios, each participant only rated a different set of two of the four possible scenarios.

Predictor variables are also separated into two levels. In this study, the Level 1 predictor was the Type of Science (i.e., HESCR or Nanotechnology) and Intellectuality of the Scientist (i.e., Pragmatic or Intellectual). Linear order effects (Level 1 predictors) were also included to control for any effects due to the order or grouping that the four scenarios were presented. Level 2 predictors were the independent variables measured at the individual level, Need for Intellection and Conservation values.

A series of models of increasing complexity were fitted to the data. Each model is statistically compared to the previous model (using the change in the -2 Log likelihood statistics) to determine whether the addition or removal of parameters improves the fit of the model. This was done in such a way to test the hypotheses stated in Section 8.1.

After establishing the null model, the first model (Model 2) includes the covariate of Age (see Appendix C3 for the covariate models). Main effects, as well as exploratory two and three way interactions, are included in Model 3 to test the hypotheses with the addition of Level 1 and Level 2 predictors. As such, the model will test all the hypotheses simultaneously in the final model, looking at the effects of Level 1 predictors (Intellectuality and Type of Science) as well as Level 2 predictors (Need for Intellection and Values) on attitudes towards scientists.

It was expected that attitudes towards scientists working in Nanotechnology will be more favourable when compared with attitudes towards scientists working in HESCR. It was also predicted that attitudes towards scientists described as intellectual would be more favourable when compared with those described as pragmatic. In addition, it was expected that individual predictors such as conservative values and one's need for intellection would predict attitudes towards scientists engaged in complex emerging technologies, such that those with a higher preference

for intellectual stimulation or those with lower conservative values would be more favourable towards scientists in general.

Finally, a series of predictions relating first order interactions between contextual and individual level predictors were made. Specifically, it was expected that individuals higher on conservative values the difference between attitudes towards scientists working in Nanotechnology as compared to HESCR will be greater than for those lower on conservative values. Also, a similar increase in attitudes towards scientists working in HESCR when compared with those working in Nanotechnology should be present for those individuals who report a higher need for intellection. It was also predicted that attitudes towards scientists described as either intellectual or pragmatic will be accentuated when individual report more negative attitudes towards intellectual activities or lower importance ratings on personal values relating to Conservation. The final series of predictions relate to second order interactions between Type of Science, level of intellectuality in the scientist, and individual level variables relating to need for intellection and conservative values. In particular it is expected that there will be differences in attitudes towards scientists based on their level of intellectuality and the type of science they perform, as persons report different higher levels of either or both Need for Intellection and Conformity.

Table 8.5

Multilevel Model Parameter Estimates for Attitude Towards High Achievers

Parameter	Model 1	Model 2	Model 3	Model 4
Intercept	4.38 (.04)	4.72 (.12)	4.53 (.14)	4.58 (.14)
Level 1 (Scenario)		Fixed Parameters		
INT			.08 (.09)	.08 (.09)
Type of Science			.39**(.08)	.38**(.08)
INT x Type of Science			-.12 (.12)	-.13 (.12)
Level 2 (Individual)				
Age		-.01*(.00)	-.01*(.00)	-.02*(.01)
NFI			.20*(.10)	.23*(.09)
Conservation			-.07 (.11)	–
Conformity			–	.14*(.06)
INT x NFI			-.20 (.13)	-.19 (.12)
INT x Conservation			-.35*(.16)	–
INT x Conformity			–	-.24*(.09)
Type of Science x NFI			-.30*(.13)	-.34*(.12)
Type of Science x Conservation			.05 (.14)	-
Type of Science x Conformity			–	-.09 (.08)
INT x Type of Science x NFI			.28 (.17)	.30 (.17)
INT x Type of Science x Conservation			-.26 (.21)	–
INT x Type of Science x Conformity			–	.28*(.12)
Level 1 (Scenario)		Random Parameters		
Intercept	.37 (.04)	.37 (.04)	30 (.03)	.29 (.03)
Level 2 (Individual)				
Intercept	.11 (.04)	.09 (.03)	.13 (.03)	.13 (.03)
-2*log likelihood	803.48	794.60	750.05	747.42
df	1	2	13	13

Notes: *$p < .05$, ** $p < .01$., $N = 194$.

NFI = Need for Intellection. INT = Intellectuality (0 = Non-Intellectual, 1 = Intellectual). Type of Science (0 = HESCR, 1 = Nanotechnology).

Table 8.5 shows that the model containing age as the covariate (Model 2) is a significantly better fit than the model with no predictors (Model 1), $\Delta LL = 8.88$, $df = 1$, $p < .01$. This difference suggested that the Individual level variable of Age contributed significantly to the variation in the participants' attitudes towards high achievers. As such, there is a very weak but significant relationship suggesting that younger persons are more favourable towards scientists when compared with older persons. The Level 1 fixed effect parameters for Model 2 determine which context variables are associated with attitudes towards scientists, whilst the Level 2 fixed effect parameters for Model 2 determine which individual variables are related to attitudes towards scientists. These estimates are comparable to regression coefficients and are considered significant when they are approximately twice the size of their standard error.

The intercepts for the fixed effects (top line of Table 8.5) give the mean attitude scores averaged across all levels, controlling for all predictor variables. The unadjusted mean level of attitudes towards scientists was 4.38, suggesting that on average participants were slightly more positive than the midpoint towards the scientists. The intercepts for the random effects provide an indication of the amount of variation in attitudes that is attributable to the two levels. Random coefficients were significant for Model 1, indicating that the individual variables and scenarios are explaining a significant amount of variance in attitude scores.

The random effect intercept for context (Level 1) was large in relation to its standard error, indicating that attitudes varied considerably across both intellectuality level of the scientist (i.e., Intellectual or Pragmatic) and the scenario (i.e., HESCR or Nanotechnology). Derived from the random intercept parameters for Model 2 in Table 8.5, 80.43% (i.e., .37/[.09+.37]) of the variance in attitudes was attributable to the Level 1 Scenario predictors (i.e., level of intellectuality in the scientist and the scenario).

Model 3 tested the predicted relationship between the Level 1 and Level 2 predictors on attitudes. The addition of the Individual and Scenario predictors resulted in a significant improvement of fit in the model ($\Delta LL = 44.55$, $df = 13$, $p < .001$). The variance in attitudes that was attributable to the Level 1 Scenario predictors of intellectuality and scenario was now 69.77% (i.e., .30/[.13+.30]). Furthermore, the individual level (i.e., Need for Intellection and Values scores) and scenario predictors (i.e., Type of Science and Intellectuality in the scientist) were able

to reduce the unexplained variance in the Scenario by 18.9% (i.e., [.37-.30]/.37]), and increase it in the Individual by 30.7% (i.e., [.13-.09]/.13])

Examining Level 1 predictors, Type of Science (β = .39, *SE* = .08) was the only significant main effect. This indicated that participants rated the scientist working in Nanotechnology significantly more positively when compared to the scientist working in HESCR. Thus, there was support for the first hypothesis that scientists working in Nanotechnology would be viewed more positively when compared to those working in HESCR. However, no support was found for the predicted main effect that attitudes would vary based on the level of intellectuality ascribed to the scientists (β = .08, *SE* = .09).

For Level 2 predictors, the results provided mixed results for the hypotheses as only Need for Intellection was a significant predictor of attitudes towards scientists (β = .20, *SE* = .10), whilst Conservation values was not (β = -.07, *SE* = .11). This indicated that participants who expressed a greater need for intellection were also more likely to be more positive towards scientists in general when compared to participants with lower Need for Intellection. As Conservation values was not a significant predictor of attitudes towards scientists, it was decided to explore whether any of the factors which made up the construct (i.e., Security, Tradition, Conformity) were. Given the results of Study 2 (see Figure 7.4), it was decided to test another Model replacing Conservation values with Conformity values. This is presented as Model 4.

Similar to Model 3, Model 4 resulted in significant improvement of fit when compared to Model 2 (ΔLL = 47.18, *df* = 13, $p < .001$). The variance in attitudes that was attributable to the Level 1 Scenario predictors of intellectuality and scenario was now 69.05% (i.e., .29/[.13+.29]). Moreover, the individual level (i.e., Need for Intellection and Conformity values) and scenario predictors (i.e., Type of Science and Intellectuality in the scientist) were able to reduce the unexplained variance in the Scenario by 21.62% (i.e., [.37-.29]/.37]), and increase it in the Individual by 30.7% (i.e., [.13-.09]/.13]).

The remaining exploratory hypotheses that involved interactions between Level 1 (Intellectuality and Type of Science) and Level 2 (Need for Intellection and Values) predictors are presented in Model 4 of Table 8.5. Level of Intellectuality in the scientist was found only to interact significantly with Conformity (β = -.24, *SE* = .09), and not with either Need for Intellection (β = -.19, *SE* = .12) or Type of Science

(β = -.13, *SE* = .12) after controlling for all other main effects and interactions. Also, Type of Science was found to significantly interact with Need for Intellection (β = -.34, *SE* = .12), however not with Conformity scores (β = -.09, *SE* = .08) after controlling for all other main effects and interactions. The significant two-way interactions, along with the main effects, are presented below in Figure 8.1 and Figure 8.2. Finally, the interaction between Intellectuality x Type of Science x Conformity was significant (β = .28, *SE* = .12) suggesting a significant difference in scores on attitudes towards scientists (see Figure 8.3a), whilst Intellectuality x Type of Science x Need for Intellection did not reach significance (β = .30, *SE* = .17).

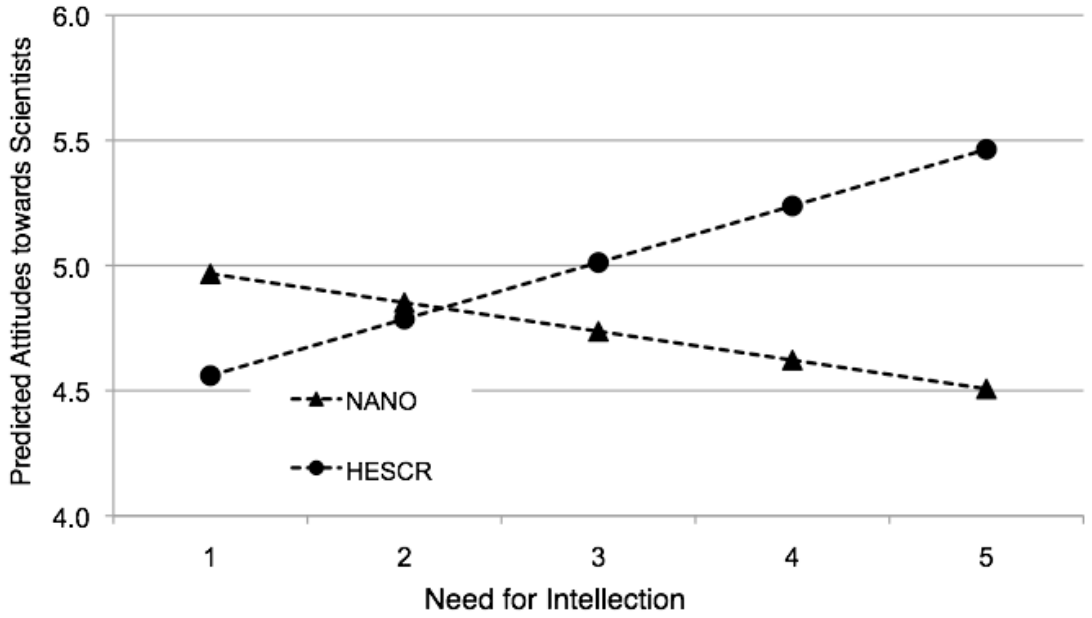

Figure 8.1. Need for Intellection and Type of Science as predictors of attitudes towards scientists. *Notes*: NANO = Nanotechnology Scientists. HESCR = Human Embryonic Stem Cell Research Scientists. Predicted Attitudes towards Scientists axis does not cover the entire range [1-7] in order to accentuate interaction effects.

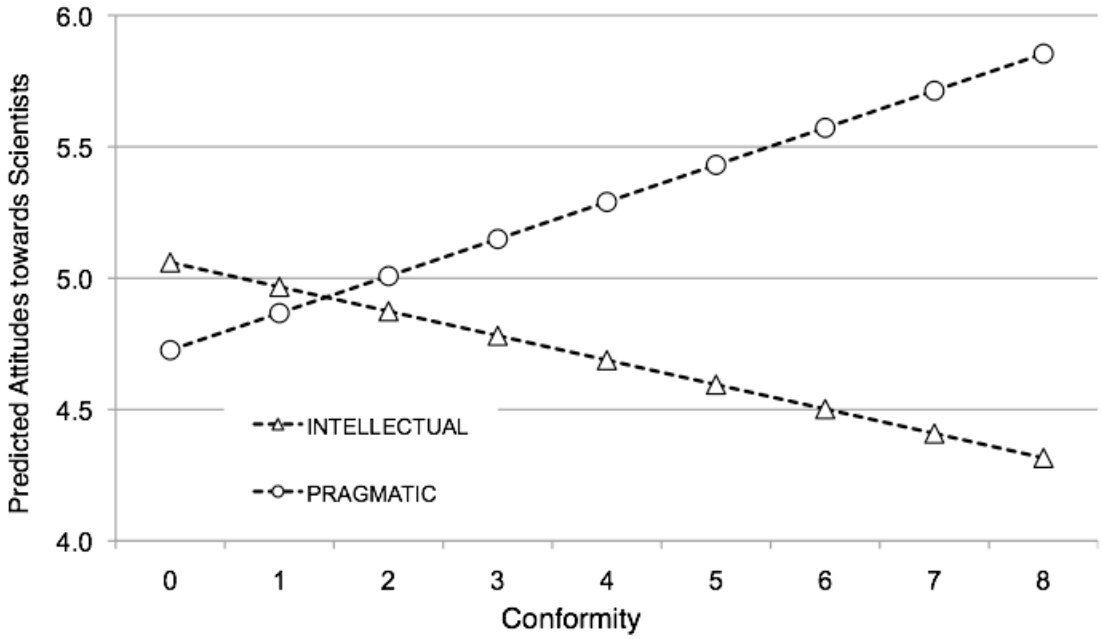

Figure 8.2. Conformity and Intellectuality as predictors of attitudes towards scientists. *Notes*: Pragmatic = Pragmatic Scientist. Intellectual = Intellectual Scientist. A constant of 1 was added to Conformity values to aid in interpretation – the range is now from 0 – 8. Predicted Attitudes towards Scientists axis does not cover the entire range [1-7] in order to accentuate interaction effects.

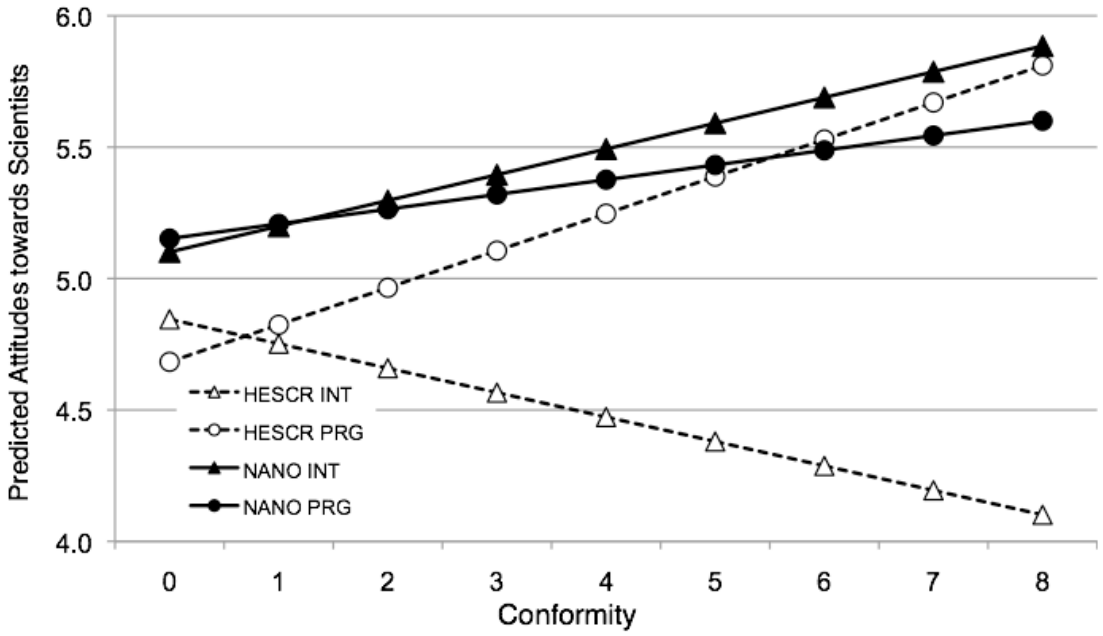

Figure 8.3. Conformity, Intellectuality and Type of Science as predictors of attitudes towards scientists. *Notes*: HESCR = Human Embryonic Stem Cell Research Scientists. NANO = Nanotechnology Scientists. INT = Intellectual Scientist. PRG = Pragmatic Scientist. A constant of 1 was added to Conformity values to aid in interpretation – the range is now from 0 – 8. Predicted Attitudes towards Scientists axis does not cover the entire range [1-7] in order to accentuate interaction effects.

As can be seen from Figure 8.1, the rate of change in predicted attitudes towards scientists differs across levels of Need for Intellection and the Type of Science being carried out. After controlling for all other effects, attitudes towards scientists working in HESCR increases alongside of a person's level of Need for Intellection. In contrast, for attitudes towards scientists working in Nanotechnology, the level of Need for Intellection increases as the predicted attitude towards them decreases. Thus, the preference for the scientist working in HESCR over Nanotechnology was larger for those who were more positive towards intellectual activities.

Figure 8.2 and Figure 8.3 depict how predicted attitudes towards scientists vary as across differences in values. For instance, in Figure 8.2 attitudes towards scientists are similar when people report Conformity as not important as guiding principles in their lives. However, as persons rate Conformity as being a more important value they are significantly more likely to favour the Pragmatic scientist over the Intellectual scientist. Figure 8.3 depicts the significant three-way interaction between Conformity values, Type of Scientist, and Intellectuality of the scientist. Specifically, persons are more favourable to Intellectual scientists working in

Nanotechnology when compared with Intellectual scientists working in HESCR alongside an increase in ratings of Conformity. This difference is non-significant for Pragmatic scientists, as ratings for both Nanotechnology and HESCR increase alongside ratings of Conformity.

8.4 Discussion

Study 3 yielded mixed results for the hypothesised influence of context and intellectualism on the perception of a particular type of tall poppy, the scientist. There was only partial support for the two main contextual predictions, that attitudes towards scientists would vary across levels of intellectuality level of the scientists and the type of science. The first hypothesis, that attitudes would be more favourable towards scientists working in Nanotechnology when compared to Human Embryonic Stem Cell Research (HESCR), was indeed supported. However, there was no support for the prediction that participants would rate scientists characterised as intellectuals more favourably when compared to scientists described as pragmatic. In addition, support was only found for some of the hypotheses relating to individual level predictors. It was found that Need for Intellection was a significant predictor of attitudes towards scientists, whilst the Conservation values was not. However, subsequent analyses with the higher order value of Conformity did yield significant main effects and interactions. Additional exploratory hypotheses also provided mixed results. Need for intellection was found to influence attitudes towards scientists based on the Type of Science, suggesting that persons with higher needs for intellection are more favourable towards scientists engaged in HESCR when compared to those working in Nanotechnology. The other exploratory hypothesis relating to an interaction between the Intellectuality of the scientist and Values was also supported, with persons being more favourable towards scientists described as Pragmatic as compared to those depicted as Intellectuals alongside an increase in reported Conformity values. Finally, there was no difference across Type of Science for Conformity values, as there were no differences attitudes towards scientists working in Nanotechnology and HESCR across values.

The primary hypothesis of this final study was supported, with a large effect found for the type of science in which the scientist works. Participants were overwhelmingly more favourable towards the scientist working in the

Nanotechnology scenario when compared to the HESCR setting. This effect of Type of Science on the attitudes towards scientists was strong, and supported previous research which has found that perceptions towards HESCR were not as favourable when compared to other emerging technologies (e.g., Critchley & Turney, 2004). This main finding lends support to several other studies that have either directly or indirectly looked at contextual differences in attitudes towards science. For example, Evans and Durant (1995) found that whilst general attitudes towards applied science such as physics or intrinsically driven science were favourable, morally contentious research (e.g., genetic engineering and the use of human embryos for research purposes) was viewed less favourably. Other research by Critchley and colleagues (Critchley & Turney, 2004; Gilding & Critchley, 2003) have also found that people are not comfortable with morally contentious research or scientific technologies such as genetically engineered foods or HESCR.

The rationale about the discrepancy in attitudes towards one emerging technology, when compared with another, centres on the notion of threat. That is, information used to distinguish the type of science across scenarios provided contextual information that may have triggered stereotypes about how certain types of scientific research (e.g., HESCR) are personally threatening given the possible applications of these technologies. These findings provide partial support for Scalmer's (2005) typology of Anti-Intellectualism, namely Anti-Intellectual Limit. The less positive attitudes towards scientists working in HESCR, as compared to Nanotechnology, provided indirect support that attitudes towards scientific research that can be seen as threatening to morals is in part explained by a reaction by others as a defensive mechanism as outlined by Anti-Intellectual Limit (e.g., when criticism of expertise is used defensively). Whilst it was found that one's own need for intellection and favourable attitudes towards intellectual exploration and critical thinking was a significant predictor of attitudes towards scientists in general, there was mixed support from the additional exploratory hypotheses that examined differences in attitudes based on the Types of Science.

The findings revealed a significant main effect for Type of Science but not for Intellectuality of Scientist on attitudes towards scientists may suggest that information regarding the context and applications of science, rather than motivations of the researcher, influence judgements about the moral character of the scientist. It is argued here that the context as well as the stereotypes and beliefs that encompass the

application of the scientific research, have an influence on shaping beliefs and attitudes towards those persons carrying out that research. Critchley (2008) found support to suggest that when persons are asked to evaluate complex scientific research they rely on heuristics rather than knowledge about the science, and make judgements about those responsible for carrying out the research. Nanotechnology and HESCR are both examples of emerging technologies where methods and applications of science are complex to many individuals (Williams, 2006). However, it is argued that the distinction between the two Types of Science simplifies down to how the research is applied, namely issues surrounding science as meddling with nature.

In recent times some scientists have been portrayed in fictional literary or cinematic works as manipulating the material world (Weingart, et al., 2003), mirroring public concerns that scientists are altering or controlling nature (Boulter, 1999). These examples, along with the findings in the present study that supported the hypothesis that attitudes towards scientists working in HESCR (i.e., application of scientific knowledge that could be seen as a possible threat to established norms in society regarding nature) to be less favourable when compared to Nanotechnology (i.e., a non-threatening application of scientific knowledge), add weight to the argument that contextual information about the applications and outcomes of scientific research are important when making judgements about complex science. Attitudes towards science are less about the perceived intellectual motivations and aspirations of the scientist, and more about the applications and outcomes of their research.

Attitudes towards complex emerging technologies depend on the available stereotypes regarding the applications of the science, ones that are learnt through social learning theories (e.g., Greenberg, 1988), and information most readily available through the mass media (Nisbet, 2005). The results suggest that attitudes towards scientists are more about the morality of what they are doing and the possible applications (i.e., type of research). However, the present study also found support for individual differences in attitudes towards intellectual activities on the perception of scientists after controlling for these effects of Type of Science.

The results also supported the hypothesis that persons favourable towards intellectual activities and exploration would be more likely to favour scientists in general when compared with those disinterested in critical thinking and exploration. These results somewhat confirm parallel findings by Feather (1991a), who reported

links between the perceiver's level of self-esteem and perceiver's level of competence and judgements of tall poppies. Similar to the argument put forward by Feather that individuals high in self-esteem and perceived level of competence would be more likely to identify with a tall poppy because it is viewed as closer to the self in relation to achievement status, the present research suggested that those with higher needs for intellection would be more likely to identify with and be more positive towards scientists who in general are stereotyped as possessing such intellectual qualities (see Haynes, 2003, for a review of scientist qualities and typologies). Further to this main effect of Need for Intellection on attitudes towards scientists, there was an interaction with the type of research carried out by the scientist.

Of the two exploratory interaction hypotheses relating to the type of science carried out, only one was found to support the expected predictions. It was suggested that one's level of intellectual curiosity or interest accentuated attitudes towards scientists depending on the Type of Science, such that those with a higher Need for Intellection were more favourable towards HESCR scientists when compared to Nanotechnology scientists (see Figure 8.1). The results supported the expected direction of the prediction. The data showed that differences in attitudes towards HESCR increased alongside increases Need for Intellection, whereas attitudes towards Nanotechnology became less favourable alongside an increase in Need for Intellection. Thus, it was unexpected that attitudes towards HESCR and Nanotechnology scientists were almost identically high in this sample for those who expressed a preference against intellectual curiosity or exploration; yet attitudes towards scientists working in Nanotechnology dropped as persons expressed a greater preference for intellectual ideas and activities.

This higher order interaction between Need for Intellection and Type of Science was present after having controlled for both significant main effects. This could be interpreted to mean that persons who express a curiosity for learning, who prefer more positive intellectual experiences over pragmatic or physical ones, may have questioned the status of the scientist engaged in the research. However, this explanation does not completely answer why this effect occurred only for scientists working in HESCR and not Nanotechnology. Perhaps scientists working in Nanotechnology are perceived as less interesting, and thus viewed less favourably when compared to scientists working in HESCR, for individuals who express a desire for intellectual stimulation. Alternatively, it could be interpreted that persons higher

on need for intellection think more about the debate of morally controversial technologies, are less pragmatic, and this is a reason why there are differences in the attitudes towards scientists.

The prediction that the level of intellectuality in the scientist would affect the perception of the scientist was not supported. There were no differences found between scientists described as motivated by either intellectual ideals or pragmatic concerns. A possible interpretation of this finding could be that attitudes towards scientists, and scientific research, is more about the source of the material than the scientist is working with and less about the intellectual aspirations of the scientists themselves. This appears to be support the findings by Critchley and Turney (2004), who found that attitudes varied across the context (i.e., attitudes towards HESCR less favourable with cloned cells when compared with HESCR using adult cells). Thus, judgements of practitioners working with new technologies in science have little to do with how engaged in the research the scientist is perceived to be, and are more about the beliefs driven by stereotypes surrounding the applications and implications of the science type.

Despite there being no significant main effect for the level of intellectuality in the scientist predicting attitudes towards scientists in general, there was an unexpected higher order interaction between level of intellectuality and values. This indicated that after controlling for all other effects, ratings of the scientist diminished alongside an increased preference for Conformity values at different rates for Intellectual versus Pragmatic scientists (see Figure 8.2). As values relating to Conformity were higher, attitudes towards scientists described as Intellectuals decreased, whilst attitudes towards scientists characterised as Pragmatic increased. Whilst an initially unexpected finding, this interaction could be explained by the relationship between conservative values and authoritarianism (Feather, 1979b, 1984). Given the status and influence of scientists in highly specialised fields, such as those in the emerging technology areas of Nanotechnology and HESCR, it is likely that these researchers were seen as authority figures.

Early concepts such as the authoritarian personality (Adorno, et al., 1950), and more recent attitudinal constructs like RWA (e.g., Altemeyer, 1981, 1988, 1996) argue that certain people have a rigid adherence to conventional, middle class values through respect and deference to authority and authority figures. An explanation for why there was a higher order interaction between intellectuality, type of the scientist

and values could be that participants who value the aspects of Conformity (i.e., restraint of actions and impulses likely to upset or harm others and violate social expectations or norms) were also more likely to defer to authority and persons of authority such as scientists. This would seem logical as those aspects of conformity have been found to overlap with key tenets of RWA such as a obedience to conventional, middle class values (Feather, 1989a; Feather, 1993a, 1993c). Thus, it is likely that participants whose value priorities indicated importance for obedience and respect, were more favourable towards scientists in general due to their position of authority on the subject matter.

Whilst these interpretations relating to Authoritarianism could explain the overall trend across value priorities, they do not account for the differentiation across scientist types (i.e., intellectual, pragmatic). Attitudes towards scientists characterised as Intellectuals were more favourable when compared to those depicted as Pragmatics alongside an increase in Conformity values (see Figure 8.2). It is possible that this relative difference was due to persons who valued social norms and expectations (e.g., Authoritarians) as seeing intellectuals as having gone too far with their research, particularly for those involved in HESCR. This may be the case, as there was a significant three-way interaction which indicated a difference in attitudes towards Scientists Types across Conformity, Intellectuality and Type of Science.

As seen in Figure 8.3, as participants reported a preference for Conformity values they were more favourable towards scientists depending on the depicted level of Intellectuality of the Scientist and the Type of Science being carried out. Whilst there was no difference in ratings for Pragmatic scientists across either scenario, Intellectual scientists were rated less favourably when carrying out HESCR as compared to work in Nanotechnology for those who placed a higher value on social norms and expectations. These results suggest the importance of considering values as a moderating factor across the type of science, given the relative importance of Conformity for intellectual scientists working in complex emerging areas considered to have threatening and non-threatening applications. Clearly, scientists engaged with pushing and furthering the boundaries of research in HESCR are seen less favourable when compared with scientists driven by the same motivations in a less threatening application such as Nanotechnology.

The implications derived from the present research contribute to the limited literature into the perception of high achievers and attitudes towards science in

general. In particular, the present research furthered an understanding of what influences attitudes towards scientists by investigating individual level predictors such as level of intellectualism and value predispositions in the perceiver. Furthermore, the study also examined contextual factors pertaining to the type of research carried out, such as scenario information and motivations of the scientist carrying out the work. Study 3 demonstrated that attitudes towards scientists have less to do with their generalised attitudes towards high achievers and more to do with the evaluation of available stereotype information about the application of scientists' research and source of the material. Put simply, it is less about the scientist and motivations that drive their work, and more about the type of science and outcomes of their research.

The implications from this study are then generally in accordance with previous social scientific research (Critchley, 2008; Critchley & Turney, 2004), as well as public opinion research (e.g., Nisbet, 2004), which has found that the type or context of science generally does influence people's attitudes towards it. Although the present study only found partial support behind the large differences in attitudes across scientific research contexts, it did not find support to indicate that intellectual motivations in the scientists influenced attitudes towards scientists. Thus, it appears that attitudes towards scientists working in emerging technologies are derived from established stereotypes and heuristics which characterise the scientist as an instrument or tool in the research process and outcomes.

In conclusion, the final study from this thesis set out to investigate contextual and intellectual differences in the perception of tall poppies working in emerging technologies. From the results, scientists appear less like typical tall poppies as evaluations about their character relate to the outcomes and application of their work rather than their personal motivations or ambitions. Perhaps it can be concluded that scientists are evaluated more by deservingness qualities (see Study 1) rather than by levels of intellectuality. Despite the mixed findings relating to Need for Intellection, intellectuality should not be discounted as a predictor in the perceptions of scientists in future research given the significant two way and three way interactions with values and type of science. Furthermore, the established relationship of Need for Intellection with deservingness in Study 1 and 2 highlight the complexity and importance of considering personal motivations and causal attributions in the prediction of attitudes towards high achievers. Furthermore, whilst there were only some significant findings highlighting the importance of values and individual

differences in intellectuality in the prediction of attitudes towards scientists in this sample, these concepts still warrant further attention. Future research should seek to disentangle the driving factors behind contextual differences in research context, stemming from intellectuality, personal value dispositions, or others.

8.4.1 Limitations

Study 3 extended on the previous research in this thesis by investigating contextual effects on the perceptions of high achievers. Although there was some support for the predicted results, there were also a few unexpected trends and limitations with the present study. The methodological issues surrounding the unexpected and non significant findings could both relate to the description of the scientist in the vignette and the operationalisation of Values in the present study. Firstly, the impact of the descriptors of the scientist will be examined and then the operationalisation of the concepts that made up the values construct.

As discussed in section 8.4, there was no significant main effect found for attitudes towards scientists due to the level of intellectuality described in the scientist. Examining Table 8.4 it is noted that there were only to be differences between the scientists described as pragmatic or as intellectual across eight of the ten characteristics, of which three were in favour of the pragmatic scientist (e.g., described more pleasant, less arrogant, and more honest when compared to the intellectual scientist). Although only speculative, due to sampling design, this could be a reason for the differences between the scientists on some characteristic scores.

In particular, the differences between scientists across Concerned for Others – Self Centered and Unassuming – Arrogant, might have been related to the vignette description. The pragmatic scientist was described as "only interested in carrying out the tasks" as compared to "is interested in expanding and pushing the boundaries". Also, the pragmatic scientist was said to be "indifferent about developing or pushing the boundaries of research", whilst the intellectual was "continuing the analysis and critique of established techniques". Thus, a plausible reason why the pragmatic scientist was rated as more self-centred and more arrogant when compared to the intellectual scientist could have been a reflection of the pragmatic scientists' lack of motivation or drive to be uninterested or unconcerned about the administration or application of their research. Whilst this explanation accounted for the difference on

certain attributes, descriptors in the vignettes did not account for the other attitudinal differences in scores across intellectuality (e.g., Honesty, Pleasantness, Being in touch with average others, Integrity, Friendliness). Whilst it is recommended that the results are interpreted with caution, it is likely that they were simply more than a mere artefact due to limitations with the last few phrases in the vignette relating to the motivations of the scientist.

CHAPTER 9

SUMMARY, INTEGRATION, AND CONCLUSIONS

9.1 Overview of the Chapter

The final chapter in this thesis will review and evaluate the studies in light of previous research, and position the findings and implications for future research. Section 9.2 examines the theoretical impact of the thesis in light of the established theoretical framework and discusses the contribution of the present research to the existing body of research. In section 9.3 methodological issues will be discussed, both those which resulted in findings and those which may have resulted in non findings. The chapter will conclude by making recommendations for future research in section 9.4, as well as discuss the implications of the present findings for theory and the wider social context in section 9.5. For now, the aims of the thesis will be revisited.

This thesis incorporated the findings from a pilot study as well as three major research studies to address the aims set out as part of this dissertation. Some studies had multiple aims, and in total there were six that were investigated. Generally speaking the aims looked at four different areas that addressed the role of context on the perception of tall poppies. They were: whether existing individual difference variables identified in extant research (e.g., Feather, 1994a) that were related to the favour or disfavour of tall poppies were also applicable to scientists, whether individual difference variables, not previously examined, that were related to attitudes towards intellectual activities and personal value priorities would predict attitudes towards scientists; and finally how contextual information influenced attitudes towards scientists.

More specifically, and to reiterate from section 5.6, the aims of the thesis were: i) to investigate whether intellectuals would be perceived as tall poppies; ii) to understand the role of deservingness and attitudes towards tall poppies in the prediction of attitudes towards both intellectuals and non-intellectuals; iii) to examine whether attitudes towards scientists were influenced from generalised attitudes towards tall poppies; iv) investigate how personal values (e.g., Conservation and Openness to Experience) and attitudes towards intellectual activities influence

judgements of scientists; v) examine how personal values and attitudes towards intellectual activities influenced attitudes towards scientists, and whether this was based on both the perceivers' level of intellectuality and the motivations of the scientist (i.e., pragmatic or intellectual); and finally, vi) to understand how context (i.e., science that is either threatening or non-threatening to conservative ego-defensive values) influenced the perception of scientists carrying out the research. These questions were important not only because they provided insight and understanding of a somewhat unique and peculiar ideology relating to Australian culture (i.e., Tall Poppy Syndrome), but they also extended the understanding of the underlying factors which influence perceptions of high achievers (i.e., scientists), something which is important in gauging and fostering public support for emerging scientific technologies and research.

9.2 Theoretical Impact of the Thesis

The research carried out as part of this thesis extended the work of Feather and colleagues (see Feather, 1994a, for a review of the research), as well as relatively new areas of research looking at the perceptions of science and scientists (e.g., Critchley, 2008). At its inception, this research set out to answer some of the questions left unanswered by Feather. Namely, whether the effects of the Tall Poppy Syndrome are contained to some areas (e.g., entertainment, business, sports) and not others (e.g., literature, science, arts).

In a summary on his research program, Feather (1994a) mentioned that tall poppies could be "presidents or prime ministers, kings or queens, high-profile entertainers, business leaders, individuals who have risen to the top of the ladder in the field of sport, or high-status people in literature, sciences, and the arts" (p. 2). Also in one of the first publications investigating attitudes towards tall poppies, Feather (1989a) questioned whether tall poppy effects were dependent on the area in which tall poppies are eminent or excel, and thus whether tall poppies are exclusive to some fields and not others. One of the major aims of this thesis was to answer these questions, and understand if the current understanding of the Tall Poppy Syndrome was applicable to intellectual high achievers or persons of status, namely scientists. Tying in with this idea, the thesis also examined the effects of context in the evaluation of tall poppies. The final area which was influenced from Feather's

research was examining the impact of individual level predictors on attitudes towards tall poppies. Specifically, the research applied existing knowledge and understanding of individual level predictors (i.e., personal values) as well a previously unexamined measure of anti-intellectualism (Eigenberger, et al., 2010) to examine attitudes towards scientists.

From a theoretical standpoint, the thesis also used the limited body of research from the public understanding of science literature to examine how evaluations of scientists could be interpreted as a proxy for attitudes towards science. That is, previous research has generally focused on opinions or attitudes towards different types of scientific enquiry (e.g., Boulter, 1999; Evans & Durant, 1995; Nisbet, 2004; Office of Science and Technology and the Wellcome Trust, 2001). However, until recently there was minimal research (Critchley, 2008) that examined attitudes towards scientists working in different areas. This thesis applied the theoretical framework from studies carried out on the Tall Poppy Syndrome (Feather, 1994a) in order to gauge attitudes towards scientists working in new and emerging technological areas. Furthermore, it was expected that the results would inform the current lack of research looking at contextual effects on the perceptions of scientists. Sections 9.2.1 through 9.2.3 will examine the theoretical impact of this thesis across three areas.

9.2.1 Does the existing literature and understanding of attitudes towards Tall Poppies apply to the perception of Intellectuals, such as scientists?

Different psychological theories applied by Feather (1994a) to gain an understanding of why people hold both positive and negative attitudes towards high achieving individuals were used as structure for the studies in this thesis. In particular, Study 1 and Study 2 based the understanding of attitudes towards intellectual high achievers in the area of values, deservingness, and the measurement of generalised attitudes towards tall poppies. In light of the findings from this thesis, this section will evaluate and reconsider some of the theoretical implications which can be added to the extant literature.

One of the most powerful, consistent, and influential findings from existing research into the Tall Poppy Syndrome to the present study of intellectual tall poppies, was the role of deservingness in the evaluation of high achievers. For example,

research by Feather (1989a; 1992) consistently found that tall poppies are less likely to be *lopped* or *cut down* when their success has been ascribed to internally attributed behaviours such as hard work or effort, as opposed to externally attributed actions like good luck or opportunity. It was apparent from these previous studies, and further developments on deservingness theory by Feather (1999a), that one of the single most important determinants of whether or not a high achiever or person of status would succumb to the Tall Poppy Syndrome would centre on deservingness.

The concept of deservingness and its effects on the perception of intellectual high achievers was studied in the Pilot and Study 1 of this thesis. Whilst not directly measured in the Pilot study, the rationale given for the lower ratings on the quality of *Tall Poppiness* for non-intellectuals i.e., Pop stars, Sportspersons, TV Celebrities, Politicians, Businesspersons) when compared to intellectuals (i.e., Artists, Poets, Writers, Academics, Scientists) was due to judgements of deservingness. That is, in the Pilot study it was inferred that across all of these different high achievers, persons were making judgements about how these groups had achieved their success.

Direct measured support for the importance of attributional judgements on attitudes towards tall poppies (both intellectual and non-intellectual) was demonstrated in Study 1. Measurements of attributions for success attributed to internal causes or behaviour (i.e., deservingness) provided strong support for why persons were less likely to view intellectual high achievers negatively. These results suggested that the strongest predictor of attitudes towards tall poppies were ratings of internally attributed actions which resulted in the high achiever's current position. Higher ratings on items of hard work and effort, as well as ability and talent, were positively related to ascribing more favourable personality characteristics to the tall poppy. Furthermore, the results suggested a trend where intellectual tall poppies were rated higher on these deservingness items when compared to non-intellectuals.

The results of Study 1 complemented existing research examining the role of attributions for success in the perceptions of tall poppies (Feather, 1989a; Feather, 1992). For example, Feather (1989a) reported that when compared to average achievers, high achievers were rated as having achieved their success by more internally attributed behaviours such as effort and ability rather than externally attributed behaviours such as good luck. Furthermore, Feather (1992) linked internally attributed behaviours and deservingness with a study looking at an achievement situation that involved either success or failure as an outcome. Feather

(1992) found that those who had achieved success with a high effort and average ability were seen as more deserving of their achievement, received more praise, and importantly more positive affect when compared to those who had achieved their success with lower effort and high levels of ability.

Deservingness therefore appears to be the discriminating factor across attitudes towards tall poppies with differing intellectuality levels. That is, deservingness or judgements about how success has been attained have a moderating effect on the context (i.e., intellectual or non-intellectual) of a tall poppy when predicting attitudes towards that group. As such, intellectual high achievers are thought of having attained success or a high position through hard work and effort as well as ability and talent most likely due to things such as their scholarly or academic achievement, literary or artistic success, and other aspects of achievement due to internally motivated and driven behaviours.

In contrast, the non-intellectuals targets in Study 1 could also be high achievers in their respective fields. Yet the distinction was that their success can be related to aspects of opportunity or luck as well as due to help from others – behaviours that are viewed as external to the person. For example, when persons think of Pop Stars or TV Celebrities they might overlook the hard work and effort put in by that person to reach the pinnacle of their field. Instead they are more likely to focus on the stereotypical attributes which suggest that the person has received a lot of help from others in getting to the top, as well as being dealt a good hand or luck. Importantly, deservingness is an equally important predictor for attitudes towards scientists as well as attitudes towards other tall poppies.

Additional results from Study 1 and Study 2 extend and qualify existing findings from research into tall poppies. In particular, the findings relating to the Favour Fall variable are interesting as they do not support previous trends from tall poppy studies (Feather, 1989a; Feather, 1991a, 1993c, 1993d; Feather & McKee, 1992; Feather, et al., 1991). Traditionally the Favour Fall subscale, an attitude measure of whether the high achiever deserves to maintain their present status, was devised to capture a general attitude of how much a person would want to bring down a tall poppy from their position. Thus, one would expect that the measure be negatively correlated with an attitudinal measure of a tall poppy (e.g., scientist) if the scientist was a tall poppy. For example, some of the results by Feather et al. (1991) reported a negative correlation between the Favour Fall variable and the Good Mixer

personality characteristics of the tall poppy that embodied aspects relating to emotionality, friendliness, attractiveness and integrity. Yet, this thesis found mixed results with the opposite trend between Favour Fall and ratings of personality characteristics for scientists in Study 2, whilst results consistent with the empirical research (Feather, et al., 1991) in Study 1.

The findings from Study 1 partially supported existing research that there is a negative relation between persons wanting to see tall poppies fall and a negative view of high achievers. However, this was qualified by an interaction which suggested that after controlling for the relationship between favour fall and attitudes towards different sorts of tall poppies (e.g., scientists, academics, sportspersons, tv celebrities), the effect of context (i.e., intellectuality of the tall poppy) influenced the direction and rate at which people favour tall poppies. The more a person favoured the fall of tall poppies in general, the more favourable they became towards intellectual tall poppies. However, there was no change in the rate at which participants view non-intellectual tall poppies (see Figure 6.1). Thus, there is some new evidence to support the primary claim of this thesis: that context matters in the evaluation of tall poppies. This argument is strengthened by the findings from Study 2.

The findings from Study 2 did not support the idea that those who generally favour the fall of tall poppies were more likely to rate tall poppies negatively on personality characteristics. Rather, a positive relationship was found between the favour fall of tall poppies and attitudes towards scientists. That is, the Favour Fall subscale of the generalised attitudes towards tall poppies measure predicted the reverse effect in Study 2 to that found in previous research (Feather, et al., 1991). Participants were more likely to level the playing field and bring down traditional tall poppies from their positions of status and achievement when they were deemed not deserving of maintaining their present position. However, scientists who were seen to be deserving of their success (see Study 1), were possibly immune from the tall poppy syndrome. It is likely that participants use established stereotypes about how scientists have achieved their success when making judgements about their personality and moral characteristics.

As noted in the results and discussion of Study 2, this positive relationship between the Favour Fall variable and attitudes towards scientists is probably due to scientists being seen as quite distinct from the traditional tall poppy. It cannot be argued that this effect is merely a salience or contrast effect that occurred due to

participants rating scientists after having completed the generalised attitudes towards tall poppy scale, as an examination of order effects ruled this out (see Appendix B2 for a detailed analysis). Thus, it seems that the generalised attitude to tall poppies scale (Feather, 1989a) which measures whether or not someone should maintain their present position or be brought down, could well be measuring attitudes towards non-intellectual tall poppies.

Additional results from Study 2 inform the extant theory on the role of values on the perception of tall poppies. Feather (1989a; 1993a) focussed on how the values of achievement (e.g., ambitious, influential, capable) and power (e.g., social power, wealth, social recognition) were positively related to the reward of tall poppies, whilst tradition maintenance values (e.g., respect for tradition, being humble, devout) and equalitarian values (e.g., favouring a level of equality amongst individuals) were related to the favour fall of tall poppies. The present thesis extended the understanding of the role of values in the perception of tall poppies, and in particular scientists. It was found in Study 2 that Conservation values predicted a participants' Need for Intellection, especially higher order values of Conformity and Security, which in turn predicted attitudes towards scientists despite no direct link between these values and attitudes (see Figure 7.4). This provided support for the idea that participants were more likely to support a tall poppy when there was a similarity or attraction with them along the dimension of intellectuality. This point will be elaborated in section 9.2.2, but this point of similarity and attraction extends beyond values and relates to key demographics.

A finding that lends support to the argument that persons evaluate intellectual tall poppies based on shared or similar characteristics relates to education level. Study 2 demonstrated that those persons who reported having attended university were more likely to both express a greater need for intellectual understanding and call for the lopping of tall poppies in general, when compared to those who reported not having attended university. Firstly, let us address the point that individuals who have engaged in higher education degrees are more likely to favour the fall of tall poppies in general when compared to those who have not attended university. This is an interesting conjecture as it suggests that persons who are educated are less likely to support that tall poppies maintain their position above the rest of society. Some interpretations for this trend could be a result of equalitarian ideals that suggest a need for more fair and balanced society, or distrust against those who are deemed to be

successful either at the expense of others or are not seen to be deserving of maintaining their status. Secondly, the relationship between university attendance and the preference for intellectual pleasures over pragmatic ones was a little less unexpected, but supported extant research that education and values are closely linked (Kohn & Schooler, 1983; Rokeach, 1973). Specifically, it was found that persons with a lower preference for Conservation values were more likely to attend university, which in turn led to the expression for intellectual stimulation.

In summary, the existing theoretical approaches that were applied from the tall poppy research (e.g., Feather, 1994a) were valuable in providing structure and impetus for research into the understanding of attitudes towards intellectual tall poppies. Specifically, the attribution of reasons for a tall poppy's success and the notion of deservingness provided a veritable demarcation between intellectual and non-intellectual tall poppies. Furthermore, this was highlighted by the disparity between the expression of favourable attitudes towards scientists and the expression of general disfavour for tall poppies to maintain their positions of status; this showed that when participants think of Tall Poppies they do not think of scientists. Combined with results that suggested persons were more likely to express positive attitudes towards scientists, when they themselves were less likely to support Conservation values, the findings from this thesis suggest the importance of acknowledging and measuring individual predictors as well as contextual factors when investigating attitudes towards all kinds of tall poppies.

Section 9.2.3 will examine the impact of context on the existing understanding of tall poppies, and the perception of scientists working in emerging fields of technology. Firstly, this section 9.2.2 will explore the role of the individual level predictors of intellectualism and personal value priorities in the formation of attitudes towards a class of intellectual tall poppies, scientists.

9.2.2 How variables relating to level of intellectualism and personal value priorities influence attitudes towards scientists

A fundamental aim of this thesis was to investigate the role of functional values and attitudes in the judgement of intellectual tall poppies (i.e., scientists). As noted in section 7.4, if scientists are to be thought of as tall poppies then they are certainly a different type when compared with traditional tall poppies (e.g., sportspersons,

politicians, celebrities). The results from Study 1 and Study 2 both provided support for the prediction that there would be a measurable distinction between intellectual and non-intellectual tall poppies. It was this conjecture that led to the conclusion that intellectual tall poppies are not susceptible to the Tall Poppy Syndrome, as they have attained their position through deserved means. However, this thesis was also interested in what other individual level predictors explained attitudes towards intellectual tall poppies, by looking at an exemplar of this category: the scientist.

Individual factors reported in extant research as influential in the perception of tall poppies were global level of self-esteem and perceived level of competence in the person making the judgment (e.g., Feather, 1991a). Similar to the rationale provided for the links between global level of self-esteem and perceived level of competence (i.e., individuals with higher levels of self-esteem and high perceived level of competence were more likely to identify with the tall poppy because the tall poppy is seen as closer to the self in relation to achievement status), the present thesis argued that the dimension of intellectuality would be important in the perception of intellectual high achievers such as scientists. That is, persons who favour activities such as the exploration of ideas, learning, and being creative should be more favourable towards intellectual tall poppies that are typified as sharing those ideals and values when compared to individuals who are less interested in these things in favour of less intellectually stimulating activities. The results from Study 2 and 3 provided support for this hypothesis.

A person's Need for Intellection (Eigenberger, et al., 2010) was found to be a significant and positive predictor of attitudes towards scientists. In an investigation of whether Need for Intellection would be a better predictor than the Favour Fall subscale from the generalised Tall Poppy Scale, findings from Study 2 showed that a preference for intellectual activities does have a small positive and significant effect on attitudes towards scientists, yet was not a better predictor than the Favour Fall subscale. Similarly, results from Study 3 provided support for the idea that a person's own need for intellectual stimulation does influence their perception of personality and moral characteristics in scientists. As such, these findings are interpreted in a similar manner to the results linking global self esteem and perceived level of competence with attitudes towards high achievers (Feather, 1991a). That is, in line with the similarity/attraction hypothesis (Byrne, 1971), Social Identity and Social Categorisation theories (e.g., Tajfel & Turner, 1985; Turner, 1987), as well as Social

Comparison Theory (e.g., Salovey & Rodin, 1984; Salovey, et al., 1991; Tesser, 1986; Tesser, et al., 1991) the findings from Study 2 and 3 provide support for the idea that participants rate themselves based on a similarity dimension when compared to intellectual tall poppies, and categorise themselves as part of a similar intellectual group. Furthermore, persons or groups who are perceived to be similar to or from the same group are more likely to be viewed more favourably.

Importantly the results from Study 2 also highlighted the link between discrete personal values and intellectualism. As predicted, it was found that participants who valued Conservation values were significantly less likely to favour intellectual activities when compared to those who valued them less so. For example, participants who valued restraint of actions, inclinations and impulses likely to upset or harm others and violate social expectations or norms over independent thought and action and creativity were significantly more likely to favour pragmatic aspects of learning, be less curious, and happier when not intellectually engaged or stimulated. Furthermore, participants' level of need for intellection significantly predicted attitudes towards scientists in Study 2. Specifically, participants who favoured intellectual activities and learning over more pragmatic tasks were also more likely to view scientists as positive (e.g., friendly, trustworthy, pleasant) when compared with those who were high on Conservation values and those who expressed a lower need for intellectual stimulation.

Results from Study 3 provided additional support to the findings relating Need for Intellection and attitudes towards scientists from Study 2, yet there only some support for hypotheses relating to discrete values. Study 3 demonstrated a significant positive main effect for Need for Intellection on predicted attitudes towards scientists. Again, this indicated that those favouring intellectual ideals and activities were significantly more likely to rate scientists as being more positive on personality qualities when compared to those low on Need for Intellection. Furthermore, there was a direct main effect found for Conformity values on the perception of scientists.

In addition to these main effects, there were several second and third order interactions between Type of Science being carried out (i.e., Nanotechnology or HESCR), Intellectuality of the Scientist (i.e., Intellectual or Pragmatic) and Values (i.e., Conformity). These second order interactions were meant that after controlling for all other effects (i.e., main effect of Conformity and Need for Intellection on predicted attitudes towards scientists), attitudes towards scientists working in HESCR

increased alongside participants' Need for Intellection. Furthermore, attitudes towards scientists varied alongside values relating to Conformity after controlling for all other effects (i.e., main effect of Need for Intellection on predicted attitudes towards scientists). Specifically, Intellectual scientists were rated less favourably when involved in HESCR as compared to Intellectuals in Nanotechnology for persons who placed a higher value on social norms and expectations.

The functional approach to understanding values and attitudes, specifically related to ego-threat, influenced the investigation of the two individual level predictors on the perceptions of scientists. The framework proposed by Scalmer (2005), suggested that attitudes and values towards intellectual ideas and persons could be a result of opposition to conservative values or critique of scientists, labelled Anti-Intellectual threat and Anti-Intellectual Limit respectively. Contrary to the hypothesised relationship between Values and attitudes towards scientists working on different types of science, there was no direct support for interpreting the results in terms of an ego-threat response. However, there was indirect support for this hypothesis. Differences in attitudes towards scientists based on Type of Science suggested that attitudes towards scientists working in HESCR were less favourable than those working in Nanotechnology, adding to the existing understanding of ambivalent attitudes towards tall poppies (e.g., Feather, 1994a) and can be interpreted as an opposition to scientific progress or justification of the critique of scientists.

Study 3 tested the effect of values assumed to be related to an ego-threat response against intellectual activities by varying contextual factors relating to the scientists. There was some support to suggest that attitudes towards scientists were a value expressive function relating to Need for Intellection. It was found that participants' attitudes and valuing of activities associated with intellectual curiosity and exploration were significantly related to the evaluations of scientists in general. Furthermore, attitudes towards scientists were significantly more positive when the Type of Science being conducted was the less ego-threatening Nanotechnology as opposed to the ego-threatening science of HESCR. Together, these findings relating to intellectual curiosity and the Type of Science being carried out suggest that attitudes towards scientists serve a functional role in the expression values. These contextual effects will be discussed in detail in section 9.2.3. It will be argued that this differentiation across Type of Science provided indirect support for the claim that

attitudes towards scientists working in emerging technologies can be understood with respect to values.

9.2.3 The role of context on the perception of Tall Poppies, in particular scientists working in emerging technologies

The final aim of this thesis was to examine how attitudes towards tall poppies varied across contexts, and specifically to address how these differences could be explained when examining tall poppies in the fields of emerging scientific research. The preliminary results from the Pilot and Study 1 demonstrated that attitudes towards different kinds of tall poppies were reliant on judgements of how they had achieved their success. The findings emphasised the importance of deservingness in the perception of tall poppies, especially when differentiating high achievers on the dimension of intellectuality. That is, these studies suggested that there was a marked difference between attitudes towards intellectual tall poppies when compared to non-intellectual tall poppies.

The findings from Study 1 were interesting in light of the seminal research by Feather (1989a) that suggested that when provided with no other information, participants did not really perceive high achievers more favourably when compared to average achievers. Although Feather found that the high achiever was rated as having more positive qualities when compared to the average achiever, there was no distinction amongst these groups on attraction. Feather interpreted this as an indication that whilst there were some initial differences between the two types of achievers, there was no basis for suggesting that the high achiever was disliked. Further research by Feather et al. (1991) outlined results relating to the differences in attitudes towards tall poppies based on context or domain in which the tall poppy was eminent in. Feather et al. found that participants rated figures from the sports domain more favourably when compared to those from the entertainment and political areas. One of the interpretations given for this finding was that tall poppies, such as sportspersons, were seen to be more deserving of achieving their success when compared to other tall poppies.

These findings relating to the effects of context on the perception of tall poppies were replicated in Study 1 of this thesis, where it was found that intellectual tall poppies were rated significantly more favourably on personality characteristics

when compared to non-intellectual tall poppies. With no descriptive information provided about the tall poppy, participants rated the group's moral or personality characteristics, thus relying on pre-existing stereotype information to judge each tall poppy group. As such, results from Study 1 suggested that perceptions of tall poppies are dependent on attributions of how they have achieved their success, and that this is evident when judging tall poppies across different contexts. However, this thesis also investigated what additional factors other than deservingness would be important in judging tall poppies across different contexts by examining scientists working in two distinct fields of emerging technology.

Scientists were rated favourably in both Study 1 and Study 2, lending support to the idea that they were deserving of their achievements and thus not really susceptible to the Tall Poppy Syndrome. The findings from Study 3 moved beyond deservingness as the justification for differences in attitudes across different contexts, as it examined effects across the Type of Science being carried out. That is, scientists were already demonstrated to be deserving of their success and achievement, and thus other individual predictors were examined as the reasons why attitudes might vary in towards scientists working in differing fields. The hypothesis that received partial support was that attitudes towards scientists working in different types of emerging technologies were a result of an ego-defensive or value expressive function. More specifically, conservative norms and values towards intellectual activities might have been seen as either a way to express or to protect one's self concept or ego against applications of science that were perceived to be threatening against established morals and normative beliefs in society.

Whilst the results from Study 3 only provided indirect support for the functional role of conservative values as an ego-threat response to the different applications of emerging scientific research, these results did demonstrate support for the value expressive nature of attitudes towards intellectual activities. The significant two-way interaction between Need for Intellection and Type of Science (see Figure 8.1) supported the idea that the expression of personal values relating to intellectuality was important when making judgements about differing applications of science. Thus, participants with greater levels of interest in intellectual pursuits were able to express their support for scientists working in morally controversial area (i.e., HESCR), when compared with a less morally controversial one (i.e.,

Nanotechnology), as they may have wished for that scientist to carry out and apply their research.

Adding to the extant research on perceptions of science (e.g., Boulter, 1999; Evans & Durant, 1995; Nisbet, 2004; Office of Science and Technology and the Wellcome Trust, 2001), the present thesis was also able to contribute to the understanding of how contextual information informed judgements of the scientist carrying out the research. This was a novel method of examining the reasons behind attitudes towards particularly complex research by looking at those who carried it out, in line with the idea that when faced with judgements about new technology persons may default to using a heuristic evaluating the trust and character in the scientist rather than information about the science (Critchley, 2008; Siegrist, 2000; Siegrist & Cvetkovich, 2000; Siegrist, et al., 2000). The present thesis supported the need to investigate the role of personality and moral characteristics in those carrying out new and complex research, but it also suggested that the effects of the individual researcher is nested in the overarching stereotype information provided to the perceived by the context. That is to say, perceived intellectual motivations and aspirations of the scientist had little effect on the judgement of their personality or moral characteristics when compared with the larger effect of morally contentious research that was provided by the context. Simply put, people seem to be favourable towards scientists in general but will use stereotypical information derived from context (as well as values relating to intellectual curiosity) over and above any personal judgements of the intellectual motivations held by the scientist when evaluating their personality or moral character.

9.3 Methodological Issues

The studies in this thesis provided support for the ideas that attitudes towards scientists are informed by theories relating to perceptions of tall poppies and high achievers, as well as integrated theories and hypotheses encompassing anti-intellectualism and values as ego-defensive responses against threat from complex science. Nevertheless, the results must be interpreted alongside the possible limitations due to both controllable and uncontrollable methodological artefacts that may have resulted in both findings and non-findings. That is to say, section 9.3.1 will address the reliability and validity of both the established measures (e.g., Tall Poppy

Scale) used in the research as well as the derived measures (e.g., Attitudes towards Scientists Scale), and section 9.3.2 will address the assumptions made regarding the conceptualisation and measurement of these variables.

9.3.1 Reliability and validity of measures

Overall the reliability of the dependent measures across all three studies was fairly good. The aim of conceptualising attitudes towards tall poppies and scientists was to replicate the factor structure of the items used by Feather and colleagues used to characterise high achievers. Generally, the existing literature on tall poppies found that people thought of high achievers across two dimensions, either labelled Integrity and Arrogance (i.e., Feather, 1993c) or Good Mixer and Self-Centered (i.e., Feather, et al., 1991). As such, all of the studies in the thesis utilised the 13 most common word pairs from existing studies (Feather, 1989a; Feather, 1993c, 1993d; Feather & McKee, 1992; Feather, et al., 1991) in order to measure attitudes towards tall poppies by virtue of capturing an evaluative dimension of their personal or moral character.

Participants in Study 1 were asked to evaluate eight different tall poppies, half of which were argued to be intellectual and the other half non-intellectual. Findings from an series of initial Exploratory Factor Analyses (see Appendix A for results) suggested a consistent attitude factor similar in structure to previous research (e.g., Feather, 1993c; Feather, et al., 1991) containing dimensions such as Integrity/Arrogance and Self-Centered/Good Mixer was not possible across all eight tall poppies. What did become clear however was that intellectuals (i.e., Academics, Scientists, Poets, Writers) were consistently perceived on two dimensions, whilst non-intellectuals (i.e., Politicians, Popstars, Sportspersons, TV Celebrities) were more commonly seen on only one dimension. So whilst the initial results suggested that intellectual tall poppies could be evaluated across two dimensions, it was decided to retain only a single dimension by which to characterise both intellectual and non-intellectual tall poppies. Thus, one of the first limitations with the dependent measure of attitudes towards tall poppies was the balance between a single and multiple factor solution which captured attitudes towards tall poppies. It is possible that because of the use of a single factor solution there was a loss of information about attitudes towards scientists and intellectual high achievers. That is, it was not practical to investigate intellectuals on social and competent aspects relating to personality similar

to those established by Feather and colleagues (Feather, 1989a; Feather, 1993c, 1993d; Feather & McKee, 1992; Feather, et al., 1991). The final 10-item solution used to represent attitudes towards tall poppies in Study 1 demonstrated good reliabilities (Cronbach's alpha ranged from .67 to .88).

A second consideration relating to the dependent measure of attitudes towards tall poppies, was item consistency across all three studies. As a series of Factor Analyses were conducted in each study to test the suitability of the semantic differential word pairs as a measure of attitudes towards tall poppies, all three studies differed slightly in the type of personal and moral characteristics used to operationalise attitudes. However, studies 1, 2, and 3 shared 8 out of 10 common personality characteristics. In this way, it was not all that dissimilar to past research by Feather and colleagues (Feather, 1989a; Feather, 1993c, 1993d; Feather & McKee, 1992; Feather, et al., 1991) who relied on different sets of semantic differential word pairs to characterise the overall factors such as Integrity/Arrogance and Self-Centered/Good Mixer variables. Thus, whilst the attitude measures across all three studies were not identical in their operationalisation of attitudes, overall they still represented a reasonably valid multi-itemed attitude measure of positive and negative qualities for tall poppies to be measured on. Although it could be argued that the slight differences in the semantic word pair items across the three studies reduce the reliability of the conclusions drawn when generalising across the studies, the likelihood of a large bearing on the results is questionable given that the attitude towards the high achiever target was an average of multiple personality and moral characteristics. The following paragraphs will address issues relating to reliability and validity surrounding the independent variables used in this thesis.

The measurement of generalised attitudes towards tall poppies was operationalised from the established Tall Poppy Scale (TPS; Feather, 1989a). The scale items form two factors, half of which express positive attitudes towards tall poppies (e.g., People shouldn't criticise or knock the very successful; The very successful person should receive public recognition for his/her accomplishments) and half which express negative attitudes towards tall poppies (e.g., It's good to see very successful people fail occasionally; Very successful people often get too big for their boots). Retrospectively, the only issue with using this well established and validated scale was how well the terms and definitions associated with tall poppies applied to present high achievers. In the same way that more recent studies by Feather and

colleagues (Feather, 2008; Feather & Naim, 2005) have only used the more reliable Favour Fall subscale of the TPS, similarly the analyses from this thesis indicated the Favour Fall subscale to be more reliable, and a better overall predictor of attitudes towards specific tall poppies when compared with both the Favour Reward subscale, or the Total Score value of the TPS (i.e., the addition of the Favour Fall subscale with the reverse of the Favour Reward subscale).

Both studies 2 and 3, which investigated attitudes towards scientific high achievers made use of an unpublished measure of attitudes towards intellectual pursuits. Eigenberger, Marques, and Critchley's (2010) generalised measure of Need for Intellection (NFI) was an adaptation of the earlier published Student Anti-Intellectualism Scale (SAIS; Eigenberger & Sealander, 2001). The NFI allowed for a measure of intellectual attitudes in a generalised sample, overcoming the very specific response choices offered by the SAIS that were targeted at students. Whilst there is no published data on the NFI measure, the factor analyses conducted on the measure (see Appendix B1 for results) indicated that the scale should be conceptualised of as two highly correlated factors representing positive and negative attitudes towards intellectual activities. However, similar to findings related to the TPS the studies found that the best and more reliable predictor of attitudes towards scientists was the positive subscale of the NFI scale. As such, the results utilised the average score of the 13 positive items that expressed a favour for intellectual activities in the Structural Equation Modelling and the Multilevel Modelling.

9.3.2 Assumptions that may have influenced the findings

Feather (1989a) defined a tall poppy as someone who is a high achiever, successful, and a person of status that is often in the public eye but is viewed from a distance and vulnerable to public criticism. One of the major aims of this thesis was to see if the tall poppy moniker and the associated reasons behind the favour fall and reward of tall poppies could be as easily applied to intellectuals, in particular scientists. This drive to find out if intellectuals were also tall poppies was because the tall poppies which Feather and others had researched (see Feather, 1999b, for a review of the studies) were high achievers in the domains of sport, entertainment, business, and politics – non-intellectual tall poppies.

Feather (1994a) alluded that tall poppies could be high achievers and persons of status from varying fields of politics, entertainment, business, and even in areas of academic prestige such as the sciences or the arts. Yet, the results from this thesis suggest that tall poppies in the fields of science, literature, or the arts are immune from the tall poppy syndrome if they are indeed conceptualised as tall poppies. For example, the Structural Equation Model from Study 2 demonstrated that attitudes towards scientists were positively predicted by the Favour Fall subscale of the TPS. This was the reverse of the expected trend for generalised attitude scale towards tall poppies found in Feather's research (e.g., Feather, 1989a). However, this thesis made the assumption that tall poppies were more than just exclusively defined as public figures of status, and could be thought of as high achieving successful individuals.

In contrast to the extant research on tall poppies, the present research did not solely define a tall poppy based on that person or group's perceived status. Rather, this thesis focussed on the tall poppy possessing the quality of being a high achiever and successful. This was often verified with a manipulation check in the various studies. For example, it was found that scientists were considered high achievers in the Study 2 and Study 3. However, in the Pilot and Study 1, the results indicated that groups classified as being intellectuals (e.g., Scientists, Academics) were rated less as tall poppies when compared to non-intellectuals (e.g., Sportspersons, Pop Stars). Thus, whilst a logical argument can be made regarding what attributes characterises similar groups of tall poppies (e.g., Peeters, 2003), some the data from this thesis suggested that at least relative to other high achievers, intellectuals are seen to have less of a tall poppy quality when compared with non-intellectuals.

The usage of the term tall poppy has changed considerably over the past 100 years or so, initially referring to someone who was a high paid individual in public office to the high achieving person of status researched by Feather. More recently, it is interesting to note that the term has once again been used in reference to outstanding young high achievers in the scientific fields with the development of a Tall Poppy Award ("The Tall Poppy Campaign," 2009). These winners of the Tall Poppy Awards are researchers in the sciences including biomedical, applied, and physical areas, who are recognised for being outstanding achievers in their field. Furthermore, if tall poppies are indeed persons of status who have achieved success in an area valued by their particular culture, the recent trend of Australian of the Year winners has seen a shift from rewarding high achievers not know for their intellectual

achievement to those working in fields such as science, technology, and the arts ("Australian of the Year," 2009).

Thus, whilst it was intended to use the term tall poppy in a value neutral manner that represented a successful high achiever, the results suggest that non-intellectuals are more likely to be tall poppies when compared to intellectuals and this could be an outcome of the associations made by persons between tall poppies and the negatively valued term Tall Poppy Syndrome. In this sense, Peeters (2003) appears to be right in saying that the term Tall Poppy was often used alongside expressions like lop, pull out, prune, and other terminology that involved the adverb down to lend a negative quality or evaluation of the term. Feather (1989a) may have indeed been correct when he was left pondering whether tall poppy "effects differ depending upon the area in which the tall poppy is eminent or excels (e.g., intellectual accomplishment, achievement in sport, success in business, or political eminence) or are they limited to some areas but not others?" (p. 265).

A further assumption made in the present thesis that may have influenced the findings, was the conceptualisation that an unfavourable attitude towards emerging technologies such as HESCR was an ego defensive response to a science that would be threatening against individual values. That is, when Conservation values are expressed by participants and their evaluations of the moral characteristics of scientists engaged in HESCR are negative, these attitudes towards scientists are a result of an ego-defensive threat response, given that HESCR can be characterised as scientific progress that meddles with established traditional beliefs through its attempt to control nature (Boulter, 1999). Firstly, there was no way of determining causation in this study with relation to values and attitudes. That is did discrete values lead to attitude expression towards tall poppies, or was there a shifting or rationalising of values based on attitudes towards these tall poppies. However, research by Eiser (1987) on the functional role of attitudes suggested that the idea of value-justification is a plausible explanation - that values may fulfil ego-defensive needs by people expressing or calling upon different values to rationalise and validate their attitudes.

The final assumption made in the research that may have influenced the findings related to the specific demographic measure of religiosity that was expected to predict attitudes towards high achievers in Study 1 (see Appendix A2) and Study 3 (see Appendix C3). In line with research by Evans and Durant (1995), it was expected that religious belief or attendance would be associated with opposition for

scientific research, especially research that is considered to be morally contentious (i.e., HESCR). However, none of the studies were able to show a link between religiosity and constructs such as intellectualism or discrete conservative personal values; constructs that were found to directly predict attitudes towards scientists. There may be several reasons why this may have happened. This research decided to operationalise religiosity as a uni-dimensional idea in line with research by Schwartz and Huismans (1995), who suggested that according to previous research (Roof, 1979), a uni-dimensional approach to conceptualising religiosity was more appropriate when the primary interest is in relating religiosity to broad cultural values as opposed to unravelling relations among differing components of religion. The thesis measured attendance at religious services as an indicator of religiosity. Results may have differed had the measure used captured other aspects of religiosity such as fundamentalism, which may relate more directly with anti-intellectualism and tie-in with conservative values.

9.4 Overall Conclusions and Recommendations for Future Research

As a whole the results from this thesis present an important first look at the perception of intellectual high achievers, as well as the role of personal values and contextual information in the judgement of scientists working in emerging technologies. Having considered the theoretical impact of this thesis on the extant research, as well as the methodological considerations that should be taken into account when drawing the final conclusions, it is now possible to both look at the overall impact of this research as well as make recommendations for future research. Whilst the common thread in the present research revolves around how to account for the perception of intellectual high achievers, suggestions will be made with reference to both the existing literature on Tall Poppies and also the literature concerning the perceptions of science and scientists.

One of the questions raised by the investigation into the differences in attitudes towards tall poppies that differed on the quality of intellectuality was the complexity by which persons evaluated high achievers. The explanation for the variation in attitudes between intellectual and non-intellectual high achievers was given as the result of a distinction in how each of the groups had achieved their present position of success through deserved or non deserved means. However, the

complexity of the attitude measure that defined all eight archetypes of tall poppies was reduced to a single dimension, despite the initial analyses suggesting multiple attitude dimensions for intellectual high achievers. Further research should examine the structure of attitudes towards intellectual and non-intellectual tall poppies, as it may be the case that perceptions of intellections are more complex when compared to non-intellectuals. Thus, it could be expected that persons may evaluate non-intellectuals similarly and consistently across multiple personality and moral characteristics, whilst intellectuals could be judged across more than one dimension. That is, perceptions of intellectuals may be complex such that persons may hold multiple and opposing attitudes towards these high achievers simultaneously; for example, an intellectual could be judged as being poor on social characteristics (e.g., emotionality, attractiveness, concerned for others) but rather favourable on characteristics relating to competence (e.g., trustworthiness, integrity, honesty). Exploring the differences in the way that people judge tall poppies would further the understanding of the tall poppy syndrome, especially disentangling any intricacy in the way persons judge high achievers across personality and moral characteristics.

The mixed support found for the role of values as an ego-threat response to research in an emerging technology such as HESCR suggested that further research is warranted. Future research may look at how other discrete values relating to security (e.g., social order) and tradition (e.g., respect for tradition) relate to the support for scientists working in research that is perceived as morally controversial. It would be expected that support for these discrete values would result in the expression of somewhat less favourable attitudes towards scientists working in morally controversial areas such as HESCR, given that research by scientists in this area would oppose and threaten these existing values that relate to social order and tradition.

Additional research should also be carried out to further the understanding of different context effects in the perception of scientists. The present research found that the context of the research was more important in the judgement of scientists when compared to information provided about their intellectual motivations and aspirations. Also, existing research suggested that persons use heuristics such as trust in scientists when faced with evaluating complex scientific research (Siegrist, 2000; Siegrist & Cvetkovich, 2000; Siegrist, et al., 2000), which is in opposition to arguments that suggest knowledge is key in the public opinion of science and

scientists (Durant, et al., 1989). However, Evans and Durant (1995) demonstrated that knowledge about science is dependent on the type of science conducted; an increase in knowledge about science relates to a positive attitude towards science and scientists, but this effect is reversed when persons are asked about their attitudes towards morally controversial research. This suggests that the interplay between level of scientific knowledge and attitudes towards science and scientists is not simple and is reliant on the context of the research.

Future studies might extend some of the findings from the final study in this thesis by looking at whether the research transgresses moral boundaries, and the effect of information provided about the research and technologies. That is, studies could manipulate knowledge provided about the emerging technology (high versus low), and type of research (morally controversial versus non-morally controversial), in order to examine these effects on the perceptions of scientists. For example, when thinking about morally controversial research it might be expected that persons would be more favourable towards scientists when asked about complex research when provided little information about the technology. In comparison attitudes towards the scientist may not be as important and thus more neutral when the research is not morally controversial, even if there is little information provided about the technology. Finally, research may wish to examine aspects of global self-esteem and perceived competence as in research by Feather (1991a) in order to investigate whether persons attitudes towards scientists are positive because people identify with them due to aspects of intellectual curiosity, or whether this may be a result of persons being psychologically secure.

9.5 Practical Implications of the Findings for Australian Society and in General

The majority of the practical implications that can be derived from this thesis center around providing information to make persons aware of the reasons surrounding the Brain Drain, perceptions of intellectual tall poppies, and perceptions of those working in emerging technological research. The research was grounded and looked at Australian tall poppies and scientists, yet it is believed that these findings are more general and could also apply globally to other high achievers and scientists where success and achievement is similarly valued. Initial claims that arose from a Senate

Legal and Constitutional References Committee (The Senate, 2005) into the extent of an Australian diaspora that suggested the nation's fabled Tall Poppy Syndrome played a part in Australians living overseas should be discounted.

It is extremely unlikely that the Tall Poppy Syndrome is responsible for the Brain Drain, but it may have indirect effects on certain individuals or groups working in fields that are thought of as intellectual. The findings from this thesis along with existing research (e.g., Feather, 1994a) suggest that people aren't victims of the tall poppy syndrome unless they are seen to be undeserving of their success or perceived negatively on personality and moral characteristics. In that case, there is not much to be concerned about if you are a good tall poppy. You need only be wary of a levelling of status if you are one of the bad tall poppies, who have most likely achieved their success through ill means or underserved actions. Nevertheless, it appears that some high achievers in the field of science may be justified in feeling undervalued.

With respect to claims that younger and more senior researchers are leaving Australian shores to find work overseas where they receive better pay and career opportunities (Boyd, 2001), this thesis can inform as to why this may be happening. Importantly this thesis found that scientists were generally rated more favourably when compared to high achievers, yet contextual as well as individual level predictors of intellectualism and values could explain in part why scientists feel undervalued. For example, the Study 2 and 3 showed that a perceiver's need for intellectual stimulation, their disfavour of tall poppies, as well as the type of science being conducted all influenced attitudes towards scientists. As such, it is conceivable that under certain conditions (e.g., a person working in a controversial area such as HESCR) a scientist may feel threatened or undervalued when the research is perceived by the public as being morally offensive and in opposition to longstanding or existing conservative values and beliefs. So the present research showed that scientists are not really prone to the Tall Poppy Syndrome, and attitudes towards them are more about what research they are involved in. Thus, it is very unlikely that the Tall Poppy Syndrome has any real negative impact on scientists feeling undervalued, as it is more likely to be a combination of the aforementioned factors.

It cannot simply be stated that Australians do not like their intellectual high achievers – in fact it appears to be quite the opposite. However, whether or not people express positive views is only a small part of the broader picture. Australia is

a society that at least traditionally values its sporting high achievers more so than its intellectual ones. As such, an individual's values relating to intellectual abilities and activities are important in a society where the traditional or established values reside on the side of pragmatism. Obviously a cultural shift that would move the spotlight from sporting achievement to intellectual achievement would take time. It is possible however, that it has already begun if one looks at the establishment of the Tall Poppy Awards ("The Tall Poppy Campaign," 2009) or the move to acknowledging scientists and other intellectuals as Australians of the year in recent times ("Australian of the Year," 2009).

There is great value in rewarding intellectuals by placing them in the public spotlight as high achieving persons of status and as leading role models for Australian society. It is also important that there is public support for scientists given the importance of public support for science itself. Understanding and increasing public support for scientists is beneficial for business and economic outcomes, as well as gains in social areas. Furthermore, it is likely that by gauging attitudes towards scientists and public support for science that this would have a significant impact on issues such as social policy for scientific funding and scientific regulation. For example, funding and regulation of new and emerging technologies by governmental bodies should make use of the information available to them regarding public attitudes towards scientists, given the importance of key aspects such as trust in the support of research being carried out (Critchley, 2008). Research and applications in new areas are not only beneficial to the country's economical prosperity and growth, but also to the social fabric of the nation by being inclusive and helping the community and individuals experience and benefit from interactions with science.

At a community or individual level the practical implications of understanding and managing the public support for science relate to engaging people to volunteer time or services. It is arguable that to some extent, volunteering practices such as participation in research or even blood or organ donation are linked with an individual's perception of the persons or organisations involved in that particular activity. For instance, persons may be influenced to donate their time to an organisation if the scientists and researchers working are seen as trustworthy, competent, and of high integrity. Thus, it is critical to communicate and work on increasing public support for science and scientists, as this will benefit individuals and society with the gains in knowledge and applications of research.

Finally, this thesis has extended the existing literature investigating attitudes towards high achievers and the Tall Poppy Syndrome by examining individual variables relating to values and intellectualism, looking at the effect of contextual information on the perception of intellectual high achievers, and providing an argument as to whether intellectuals are susceptible to the Tall Poppy Syndrome. It appears that scientists are not part of the same *genus* as traditional non-intellectual tall poppies. As such, efforts to retain intellectuals in this country, and more specifically scientists, should not focus on challenging the Tall Poppy Syndrome but rather emphasise the benefits of research into emerging technologies.

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Appendix A1

Development of the Attitudes Towards High Achievers Scale

Due to the nature of sampling, there were different totals of respondents for each of the eight high achiever scales. Means and standard deviations are presented in Table A1.1.

The 13 items that respondents evaluated on the semantic differential space are presented in two evaluation dimensions, Self Centered and Good Mixer as per previous research by Feather and colleagues (Feather, 1989a; Feather, 1993c, 1993d; Feather & McKee, 1992; Feather, et al., 1991). These two dimensions form the theoretical basis for the present EFAs.

Table A1.1

Means and Standard Deviations for all Attitudes Towards High Achievers items

Items / High Achiever	ACA		POE		SCI		WRI		POL		POP		SPO		TVC	
	M	*(SD)*	*M*	*(SD)*	*M*	*(SD)*	*M*	*(SD)*	*M*	*(SD)*	*M*	*(SD)*	*M*	*(SD)*	*M*	*(SD)*
Self Centered																
Honest	4.99	(1.27)	4.82	(1.17)	5.04	(1.15)	4.61	(1.07)	2.52	(1.24)	4.12	(1.04)	4.01	(1.08)	3.73	(1.14)
Polite	4.76	(1.26)	4.48	(0.89)	4.60	(1.10)	4.43	(1.12)	3.59	(1.43)	3.87	(1.29)	4.01	(1.25)	3.85	(1.27)
Trustworthy	5.04	(1.25)	4.49	(1.04)	4.80	(1.36)	4.52	(1.01)	2.62	(1.43)	3.96	(0.98)	3.95	(1.14)	3.81	(1.01)
Concerned for others	4.45	(1.26)	4.43	(1.12)	4.64	(1.29)	4.30	(1.18)	2.88	(1.15)	3.40	(1.30)	3.47	(1.27)	3.17	(1.30)
Pleasant	4.70	(1.16)	4.56	(0.99)	4.57	(1.00)	4.51	(1.01)	3.27	(1.34)	4.34	(1.20)	4.26	(1.22)	4.18	(1.20)
Unassuming	3.90	(1.18)	4.31	(1.01)	4.21	(1.11)	4.18	(1.08)	2.40	(1.08)	3.33	(1.25)	3.15	(1.24)	2.82	(1.07)
Follows the rules	4.73	(1.39)	3.93	(1.21)	4.68	(1.42)	4.01	(1.06)	3.10	(1.61)	3.79	(1.34)	3.77	(1.52)	3.32	(1.28)
Good Mixer																
Self Controlled	4.92	(1.24)	4.22	(1.04)	4.85	(1.10)	4.35	(1.09)	4.45	(1.53)	3.71	(1.20)	3.71	(1.26)	3.90	(1.23)
Attractive	3.65	(0.96)	3.88	(1.00)	3.68	(0.94)	3.83	(0.86)	2.21	(1.26)	4.66	(1.46)	4.47	(1.26)	4.77	(1.42)
Unemotional	3.93	(1.10)	5.55	(1.32)	3.78	(1.13)	4.95	(1.12)	3.33	(1.39)	5.05	(1.09)	4.65	(1.19)	4.49	(1.09)
In touch with average	4.28	(1.53)	4.19	(1.37)	3.96	(1.42)	4.40	(1.28)	2.64	(1.31)	3.75	(1.55)	3.73	(1.41)	3.25	(1.49)
High Integrity	5.23	(1.23)	4.58	(1.02)	5.36	(1.05)	4.65	(1.00)	3.19	(1.55)	3.95	(1.23)	4.23	(1.21)	3.81	(1.19)
Friendly	4.80	(1.25)	4.78	(1.00)	4.59	(1.05)	4.54	(0.97)	3.65	(1.38)	4.57	(1.24)	4.45	(1.18)	4.29	(1.25)
N	120		104		138		145		154		134		150		126	

Notes: ACA = Academics, POE = Poets, SCI = Scientists, WRI = Writers, POL = Politicians, POP = Pop Stars, TVC = TV Celebrities. Word Pairings: Honest/Dishonest, Polite/Rude, Trustworthy/Untrustworthy, Concerned for Others/Self-Centered, Pleasant/Unpleasant, Unassuming/Arrogant, Follows the rules/Bends the rules, Self-Controlled/Quick Tempered, Attractive/Unattractive, Unemotional/Emotional, In touch with the average person/Out of touch with the average person, High Integrity/Low Integrity, Friendly/Unfriendly.

Two factor solutions

The 13 items of the attitudes towards high achievers scales were subjected to multiple factor analyses across each of the eight high achievers (i.e., academics, poets, scientists, writers, politicians, pop stars, sportspersons, and tv celebrities) using SPSS 12. The analyses were in part an attempt to replicate Feather and colleagues (Feather, 1989a; Feather, 1993c, 1993d; Feather & McKee, 1992; Feather, et al., 1991) consistent structure based on which people evaluated high achievers across two dimensions.

Prior to performing the factor analysis the suitability of the data was assessed, and the correlation matrix for each high-achiever revealed varying levels of coefficients at .3 or above – indicating the suitability for factor analysis. The Kayser-Meyer-Oklin measure of sampling adequacy ranged from .68 to .88, all exceeding the recommended value of .6 (Kaiser, 1970, 1974). The assumption of sphericity was also upheld, thus supporting the factorability of the correlation matrix, with Bartlett's test (1954) being significant across the eight high achievers with the chi-square ranging from 303.47 to 857.62 ($df = 78$, $p < .001$).

Factor analysis using the principle components method and varimax rotation was performed on each of the eight high achievers scales. Interestingly, Catell's scree test (Catell, 1966) indicated a difference in the position of the elbow between intellectuals and non intellectuals. That is, the bend in the elbow was after one factor for the non-intellectuals and generally after 2 or more factors for the intellectual high achievers. An initial EFA was conducted to assess whether the items grouped into the suggested theoretical factors. Table A1.2 shows the factor loadings and reliabilities of the forced two factor solution presented below.

Table A1.2

Factor Loadings and Reliabilities for all Attitudes Towards High Achievers items using Principle Components Factor Analysis and Varimax Rotation

Items / High Achiever	ACA[b]		POE[b]		SCI[a]		WRI[a]		POL[a]		POP[b]		SPO[a]		TVC[b]	
	F1	F2	F1	F2	F1	F2	F1	F2	F1	F2	F1	F2	F1	F2	F1	F2
Self Centered (F1)																
Honest	.75*	.11	.56*	.20	.76*	.14	.64*	.27	.70*	.35	.60*	.30	.66*	-.05	.47	.54*
Polite	.56*	.54*	.70*	-.07	.69*	.37	.72*	.30	.24	.83*	.73*	.08	.80*	.10	.59*	.48
Trustworthy	.79*	.12	.70*	.05	.62*	-.14	.70*	.23	.69*	.36	.77*	.01	.54*	.24	.57*	.49
Concerned for others	.54*	.56*	.55*	.28	.59*	.30	.67*	.19	.57*	.52*	.66*	-.20	.70*	-.03	.66*	.39
Pleasant	.58*	.48	.72*	.08	.48*	.36	.70*	.36	.50*	.67*	.71*	.21	.66*	.38	.80*	.17
Unassuming	.32	.45*	.28	.58*	.45*	.41	.61*	-.12	.67*	.42	.61*	-.40	.63*	.17	.30	.68*
Follows the rules	.69*	-.25	.06	-.28	.41	-.21	.07	.58*	.36	.29	.50*	-.31	.64*	.04	-.05	.66*
Reliability (alpha)	.81	–	.64	–	.72	–	.79	–	.86	–	.80	–	.81	–	.83	–
Good Mixer (F2)																
Self Controlled	.54*	.22	.45	-.13	.60*	.02	.63*	-.04	-.13	.85*	.74*	-.11	.67*	-.30	.50*	.38
Attractive	-.10	.53*	-.15	.66*	-.02	.68*	-.19	.63*	.57*	-.06	.15	.77*	.13	.45*	.75*	-.38
Unemotional	-.19	.63*	.53*	.35	-.18	.63*	.12	.54*	.49*	.07	-.02	.52*	-.07	.80*	.04	.18
In touch with average	.14	.69*	.10	.77*	.11	.69*	.64*	.03	.63*	.34	.60*	.18	.53*	.29	.44	.62*
High Integrity	.57*	-.01	.37	-.13	.65*	.02	.30	.49*	.66*	.10	.57*	-.09	.61*	.24	.56*	.43
Friendly	.34	.58*	.70*	-.05	.31	.68*	.39	.52*	.49*	.51*	.51*	.11	.65*	.22	.52*	.59*
Reliability (alpha)	–	.57	–	.43	–	.58	–	.51	–	.65	–	.51	–	.55	–	.67

Notes: Significant Factor Loadings are those greater than: a = .45, b = .50.
ACA = Academics, POE = Poets, SCI = Scientists, WRI = Writers, POL = Politicians, POP = Pop Stars, TVC = TV Celebrities.
Word Pairings: Honest/Dishonest, Polite/Rude, Trustworthy/Untrustworthy, Concerned for Others/Self-Centered, Pleasant/Unpleasant, Unassuming/Arrogant, Follows the rules/Bends the rules, Self-Controlled/Quick Tempered, Attractive/Unattractive, Unemotional/Emotional, In touch with the average person/Out of touch with the average person, High Integrity/Low Integrity, Friendly/Unfriendly.
Reliability refers to reliability of items as predicted by theoretical assumptions.

The general indication from Table A1.2 is that non-intellectual high achievers tend to have the majority items load on a single factor (i.e., between eight and eleven of the thirteen items). In contrast, the intellectual high achievers have a less consistent pattern, suggesting that the majority are split over the two theoretically predicted factors. This is an interesting effect, which may suggest that intellectuals are evaluated across two dimensions whereas non-intellectuals across one. Since it is not the purpose of the present research to distinguish the evaluative processes for different types of high achievers, the focus was still to achieve a common attitude measure for all of the eight high achievers. Furthermore, it can be seen from the expected theoretical structure, that the reliability statistics for a two factor solution are poor. Although not entirely desirable given the apparent structural differences between intellectuals and non-intellectuals, the present research is interested in predictors of attitudes towards these different high achievers, and as such a single factor solution may indeed be more parsimonious and easily interpretable. As such, it was decided to force a single factor solution for all 13 items across each of the eight high achiever types, and then remove items according to the following criteria.

The criteria for examining whether items were suitable were based on factor loading and a priori conditions. The condition for the removal of items was that the item did not load across at least two out of eight of the high achiever types. Skewness values were also examined, and item deletion statistics would be taken into account such that if the reliability coefficient would need to improve if the item were to be deleted.

One factor solutions

The thirteen items across the eight attitudes towards high achievers scales were analysed using a single factor forced EFA, and are presented in Table A.3. The Kayser-Meyer-Oklin measure of sampling adequacy ranged from .68 to .88, all exceeding the recommended value of .6 (Kaiser, 1970, 1974). The assumption of sphericity was also upheld, thus supporting the factorability of the correlation matrix, with Bartlett's test (1954) being significant across the eight high achievers with the chi-square ranging from 303.47 to 857.62 ($df = 78$, $p < .001$). Table A1.4 presents an analysis of skewness for the thirteen items across the eight high achiever types.

Table A1.3

Factor Loadings and Reliabilities for all Attitudes Towards High Achievers items using a 1 Factor Principle Components Factor Analysis Forced Solution

Items / High Achiever	ACA[b]	POE[b]	SCI[a]	WRI[a]	POL[a]	POP[b]	SPO[a]	TVC[b]
Honest	.67*	.60*	.72*	.69*	.76*	.60*	.64*	.71*
Polite	.77*	.66*	.78*	.78*	.71*	.73*	.80*	.76*
Trustworthy	.71*	.68*	.46*	.74*	.77*	.77*	.58*	.75*
Concerned for others	.76*	.61*	.66*	.69*	.77*	.66*	.68*	.75*
Pleasant	.75*	.71*	.60*	.79*	.81*	.71*	.73*	.71*
Unassuming	.52*	.42	.60*	.50*	.78*	.61*	.65*	.67*
Follows the Rules	.42	-.01	.23	.31	.46*	.50*	.63*	.39
Self Controlled	.57*	.40	.52*	.55*	.44	.74*	.58*	.63*
Attractive	.23	.03	.35	.10	.40	.15	.23	.32
Emotional	.21	.60*	.18	.34	.42	-.02	.11	.15
In touch with the average person	.52*	.30	.46*	.59*	.70*	.60*	.58*	.74*
High Integrity	.45*	.32	.56*	.48*	.57*	.57*	.65*	.71*
Friendly	.62*	.67*	.62*	.57*	.71*	.51*	.68*	.77*
Reliability (alpha)	.82	.71	.77	.82	.88	.81	.84	.87

Notes: * Indicates significant factor loadings where: a = .45, b = .50.
ACA = Academics, POE = Poets, SCI = Scientists, WRI = Writers, POL = Politicians, POP = Pop Stars, TVC = TV Celebrities.
Word Pairings: Honest/Dishonest, Polite/Rude, Trustworthy/Untrustworthy, Concerned for Others/Self-Centered, Pleasant/Unpleasant, Unassuming/Arrogant, Follows the rules/Bends the rules, Self-Controlled/Quick Tempered, Attractive/Unattractive, Unemotional/Emotional, In touch with the average person/Out of touch with the average person, High Integrity/Low Integrity, Friendly/Unfriendly.

Table A1.4

Skewness Statistics for Items across Each of the Eight High Achievers

Items / High Achiever	ACA	POE	SCI	WRI	POL	POP	SPO	TVC
Honest	-3.58**	-1.58	-1.56	0.23	3.21*	-1.74	0.58	-2.63*
Polite	-1.50	0.96	0.56	1.05	-0.22	-0.17	0.19	-0.53
Trustworthy	-3.72**	0.44	-2.44*	2.33*	4.42*	-2.93*	-0.09	-2.14*
Concerned for others	-1.56	0.01	-1.50	-0.23	2.79*	0.41	-0.69	-0.02
Pleasant	-1.37	0.08	0.61	-0.04	0.75	-1.84	-0.99	-0.75
Unassuming	0.33	0.81	1.55	-0.16	3.47**	2.41*	1.89	1.73
Follows the Rules	-2.46*	-0.85	-0.77	-1.13	2.20*	0.78	0.57	1.39
Self Controlled	-2.16*	-0.38	0.14	1.19	-0.51	0.12	0.65	-0.18
Attractive	-3.70**	-2.03*	-3.88**	-4.36**	4.33**	-2.64*	-1.84	-3.45**
Emotional	-2.20*	-4.42**	-0.44	-1.61	0.57	-4.70**	-1.69	-2.31*
In touch	-0.99	-1.01	-0.83	-0.22	4.05*	-0.28	0.31	1.00
High Integrity	-4.14**	0.40	-1.87	-0.58	1.33	-1.15	0.00	0.01
Friendly	-2.96*	-0.53	0.35	0.97	-1.27	-2.32*	-2.70*	-1.28

Notes: * $p < .01$. ** $p < .001$.
ACA = Academics, POE = Poets, SCI = Scientists, WRI = Writers, POL = Politicians, POP = Pop Stars, TVC = TV Celebrities
Word Pairings: Honest/Dishonest, Polite/Rude, Trustworthy/Untrustworthy, Concerned for Others/Self-Centered, Pleasant/Unpleasant, Unassuming/Arrogant, Follows the rules/Bends the rules, Self-Controlled/Quick Tempered, Attractive/Unattractive, Unemotional/Emotional, In touch with the average person/Out of touch with the average person, High Integrity/Low Integrity, Friendly/Unfriendly.

As seen in Table A1.3, most items load onto a single factor with the exception of Follows the Rules (Bends the Rules), Attractive (Unattractive), and Emotional (Unemotional). The item loadings for each theoretical factor also added to the case for the removal of the items: Follows the Rules (loadings ranged from -.01 to .63), Attractive (loadings ranged from .03 to .40), and Emotional (loadings ranged from -.02 to .60). Analysis of reliability statistics also indicated that the reliability of each scale would increase with the removal of these items. In addition, the skewness values presented in Table A1.4 also indicate that the items Attractive (Unattractive), and Emotional (Unemotional) were significantly skewed across five and three of the high achiever types respectively. Taking these tests into consideration, it was decided to remove these three items and perform another single factor solution with the remaining 10 items. This is presented in Table A1.5.

Table A1.5

Factor Loadings and Reliabilities for remaining 10 Attitudes Towards High Achievers items using a 1 Factor Principle Components Factor Analysis Forced Solution

Items / High Achiever	ACA[b]	POE[b]	SCI[a]	WRI[a]	POL[a]	POP[b]	SPO[a]	TVC[b]
Honest	.67*	.58*	.73*	.70*	.76*	.61*	.63*	.70*
Polite	.77*	.70*	.79*	.77*	.73*	.71*	.81*	.77*
Trustworthy	.71*	.70*	.49*	.75*	.77*	.77*	.61*	.75*
Concerned for others	.77*	.65*	.68*	.69*	.78*	.67*	.68*	.75*
Pleasant	.76*	.71*	.61*	.79*	.83*	.72*	.74*	.71*
Unassuming	.55*	.42	.59*	.53*	.79*	.61*	.65*	.69*
Self Controlled	.56*	.43	.53*	.56*	.46*	.74*	.59*	.64*
In touch with the average person	.55*	.29	.44	.61*	.70*	.62*	.57*	.75*
High Integrity	.44	.30	.57*	.47*	.56*	.57*	.63*	.72*
Friendly	.60*	.63*	.60*	.55*	.71*	.51*	.69*	.77*
Reliability (alpha)	.82	.67	.78	.82	.86	.81	.83	.88

Notes: * Indicates significant factor loadings where: a = .45, b = .50.
ACA = Academics, POE = Poets, SCI = Scientists, WRI = Writers, POL = Politicians, POP = Pop Stars, TVC = TV Celebrities.
Word Pairings: Honest/Dishonest, Polite/Rude, Trustworthy/Untrustworthy, Concerned for Others/Self-Centered, Pleasant/Unpleasant, Unassuming/Arrogant, In touch with the average person/Out of touch with the average person, High Integrity/Low Integrity, Friendly/Unfriendly.

As seen in Table A1.5 there was no change or a slight increase in most of the reliabilities, with the exception of the attitudes towards Poets items due to there being four items that were still below acceptable factor loading criteria. The Kayser-Meyer-Oklin measure of sampling adequacy ranged from .76 to .89, all exceeding the recommended value of .6 (Kaiser, 1970, 1974), and overall being higher than the previous factor solution. The assumption of sphericity was also upheld, thus supporting the factorability of the correlation matrix, with Bartlett's test (1954) being significant across the eight high achievers with the chi-square ranging from 207.37 to 748.75 ($df = 45$, $p <$ .001). On the whole this is a much more parsimonious and homologous fit across the eight high achiever types.

Appendix A2

Covariate Multi-Level Models for Study 1

A series of Multi-Level models to check for covariates were tested at both Level 1 (context) and Level 2 (individual). The first series of models are presented in Table A2.1, and investigate any order effects on attitudes. Table A2.2 shows the results from the models looking at the effects of individual predictors on attitudes. Finally, Table A2.3 is the final set of covariates for the first study.

Table A2.1

Multilevel model parameter estimates for Level 1 predictors for attitude towards high achievers

Parameter	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Intercept	4.12 (.03)	4.12 (.03)	4.13 (.03)	4.11 (.03)	4.10 (.03)	4.08 (.03)	4.12 (.03)	4.10 (.03)
Level 1 (Context)				Fixed Parameters				
Order 1		-.01 (.10)	—	—	—	—	—	—
Order 2			-.01 (.09)	—	—	—	—	—
Order 3				.07 (.09)	—	—	—	—
Order 4					.17 (.09)	—	—	—
Order 5						.34* (.10)	—	—
Order 6							-.00 (.09)	—
Order 8								.10 (.09)
Level 1 (Context)				Random Parameters				
Intercept	.88 (.04)	.88 (.04)	.88 (.04)	.88 (.04)	.88 (.04)	.88 (.04)	.88 (.04)	.88 (.04)
-2*log likelihood	2886.434	2915.83	2915.10	2915.29	2912.50	2903.56	2915.84	2914.11
df	1	2	2	2	2	2	2	2

Notes: *p < *.05,* N = *285.*
Order 7 was excluded from analyses due to it containing an error in a target group.

Table A2.2

Multilevel model parameter estimates for Level 2 predictors for attitude towards high achievers

Parameter	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Intercept	4.12 (.03)	4.44 (.08)	4.23 (.09)	4.23 (.09)	4.02 (.07)	4.10 (.03)	4.24 (.14)	4.13 (.06)	4.56 (.11)
Level 2 (Individual)				Fixed Parameters					
Age		-.01*(.00)	—	—	—	—	—	—	-.01*(.00)
Gender			-.13*(.06)	—	—	—	—	—	-.02 (.06)
Education				-.02 (.02)	—	—	—	—	—
Employment					.02 (.01)	—	—	—	—
Current Study						.34*(.10)	—	—	-.12 (.08)
Residence							-.35(.21)	—	—
Religiosity								-.01 (.03)	—
Level 2 (Individual)				Random Parameters					
Intercept	.01 (.02)	-.01 (.02)	.01 (.02)	.01 (.02)	.01 (.02)	.01 (.02)	.01 (.02)	.01 (.02)	-.01 (.02)
-2*log likelihood		2896.86	2901.79	2882.41	2913.69	2904.95	661.354	2871.22	2883.22
df	1	2	2	2	2	2	2	2	4

Notes: *p < .05, *N* = 285.
Gender, 1 = female, 2= male. Education, 1 = University attendance, 2 = no University attendance

Table A2.3

Multilevel Model Parameter Estimates for Attitude Towards High Achievers

Parameter	Model 1	Model 2
Intercept	4.12 (.03)	4.39 (.08)
Level 1 (Context)	Fixed Parameters	
Order 5		.30* (.09)
Level 2 (Individual)		
Age		-.01* (.00)
Level 1 (Context)	Random Parameters	
Intercept	.88 (.04)	.89 (.04)
Level 2 (Individual)		
Intercept	.02 (.02)	-.02 (.02)
-2*log likelihood	2915.83	2886.43
df	1	3

Note: *p < .05, N = *285.*

As seen in Table A2.1, Order 5 was a significant predictor of attitudes. This implied there was something about Order 5 (i.e., Scientists, Pop Stars, Academics, TV Celebrities) that influenced attitude scores. As such, this item was selected as a covariate, to control for any effect that this ordering may have on further models. Table A2.2 shows the results from the individual level predictors that were screened as covariates. Whilst Age, Gender, and Current Study were all found to be significant predictors of attitudes towards high achievers, once placed together in Model 9 it can be seen that Age is the only significant covariate left. This would indicate that these variables had somewhat of a shared covariance, and Age was most indicative of this relationship. Table A2.3 presents the final covariates, at both Level 1 and Level 2, that significant improved the fit of the model, $\Delta LL = 29.40$, $df = 2$, $p < .001$. Thus it can be seen that as age increases, level of favourability of attitudes decreases. Furthermore, Order 5 had quite a significant effect on attitudes, $\beta = .30$ $SE = .09$, and it was included as a covariate.

Appendix B1

Need for Intellection Scale

The items in below have to do with sources of excitement. Please indicate the degree to which you feel the item is a false or true statement about you by circling a number according to the scale.

Circle the number

1 if the statement is completely false for you
2 if the statement is mostly false for you
3 if you are in between
4 if the statement is mostly true for you
5 if the statement is completely true for you

1. Working on difficult intellectual problems is enjoyable and stimulating for me
2. I like the challenges that can be found in the more theoretically-sophisticated university courses
3. I generally find physical or recreational activities more satisfying than intellectual activities
4. The process of learning the major concepts in science, history, art, etc., is kind of addictive for me
5. I tend to feel somewhat bored and impatient when dealing with remote, theoretical problems
6. I often feel energized by insights I receive during a lecture, or while researching an issue
7. I have a continuing need and desire to learn, analyze, and evaluate new concepts
8. Intellectual discovery is ok, but I prefer other forms of excitement
9. I'm probably the sort of person who would find it thrilling to be engrossed in a research project
10. I deliberately seek out sources of intellectual stimulation

11. Generally speaking, I’m satisfied to ‘take things as they are’ and leave most of the analysis and theorizing for the specialists
12. I often experience theories as having a special kind of ‘beauty’ about them
13. Just as some people feel a need for physical excitement, I feel a need for thinking and conceptual challenges
14. I have more exciting things to do than sit around and think all day long
15. I feel compelled to work on conceptual problems, even when I don’t have to.
16. I have a certain 'inner tension' or need that is satisfied only through intellectual experiences
17. Putting a lot of energy into theories and speculation is unpleasant for me
18. I often enjoy the sensation of 'pushing my brain to the breaking point' in the quest for new concepts and ideas
19. One of my favourite activities is discovering alternative ways of explaining a particular phenomenon
20. The process of examining a concept in great detail is generally unappealing to me

Appendix B2

Psychometric properties of the scales used in Study 2

Analysis of the Need for Intellection scale

The 20 items of the Need for Intellection (NFI) were subjected to a factor analysis using SPSS version 12 to test whether the devised scale comprised of more than one factor. Prior to performing the factor analysis the suitability of the data was assessed. Inspection of the correlation matrix revealed many coefficients at .3 or above. Kayser-Meyer-Oklin measure of sampling adequacy was .95, exceeding the recommended value of .6 (Kaiser, 1970, 1974) and Bartlett's Test of Sphericity (Bartlett, 1954) was significant ($\chi^2 = 4594.84$, $df = 190$, $p < .001$) supporting the factorability of the correlation matrix.

Factor analysis using the maximum likelihood method revealed the presence of two components with eigenvalues exceeding 1, explaining 43.78 percent and 7.43 percent of the variance respectively. Upon investigation of Catell's scree test (Catell, 1966), it was decided to retain two components for further analysis due to the clear break after the second component. To aid in the interpretation of the two components, Oblimin rotation was performed as the items were highly correlated, and the components had a correlation of $r = .66$. The solution is presented below in Table B2.1.

Table B2.1

Factor Loadings for all Need for Intellection items using Maximum Likelihood Factor Analysis and Oblimin Rotation

Item	*Factor 1*	*Factor 2*	*Communality*
15	.85*	-0.18	0.56
16	.84*	-0.07	0.63
19	.74*	-0.01	0.54
13	.73*	-0.1	0.63
18	.72*	0.08	0.45
10	.64*	0.19	0.6
12	.63*	-0.03	0.37
7	.60*	0.12	0.47
2	.56*	0.2	0.5
4	.54*	0.13	0.4
1	.54*	0.2	0.47
9	.52*	0.17	0.41
6	.42*	0.24	0.37
14	-0.03	.68*	0.44
8	0.02	.66*	0.46
5	-0.06	.55*	0.26
17	0.16	.54*	0.43
3	0.07	.49*	0.29
11	0.28	.49*	0.49
20	0.25	.42*	0.38
15	.85*	-0.18	0.56
16	.84*	-0.07	0.63
Eigenvalue	8.23	.92	
(% total variance)	(41.13)	(4.59)	

Notes: $N = 484$.

* = Significant factor loadings

Two clear factors emerged from the analysis, with all positively worded items loading onto factor 1 and negatively worded items loading onto factor 2. The two factor solution explained a total of 45.72 per cent of the variance, with factor 1 contributing 41.13 percent and factor 2 contributing 4.59 percent. As such, a further analysis was undertaken to verify the factor structure of the scale using SEM. The model, which estimated 61 parameters with 466 cases was found to be a good fit with the data ($\chi^2 = 524.56$, $df = 169$, $p < .001$, IFI = .92, CFI = .92, RMSEA = .07 [90% CI .06 - .07]) is presented in Figure B2.1.

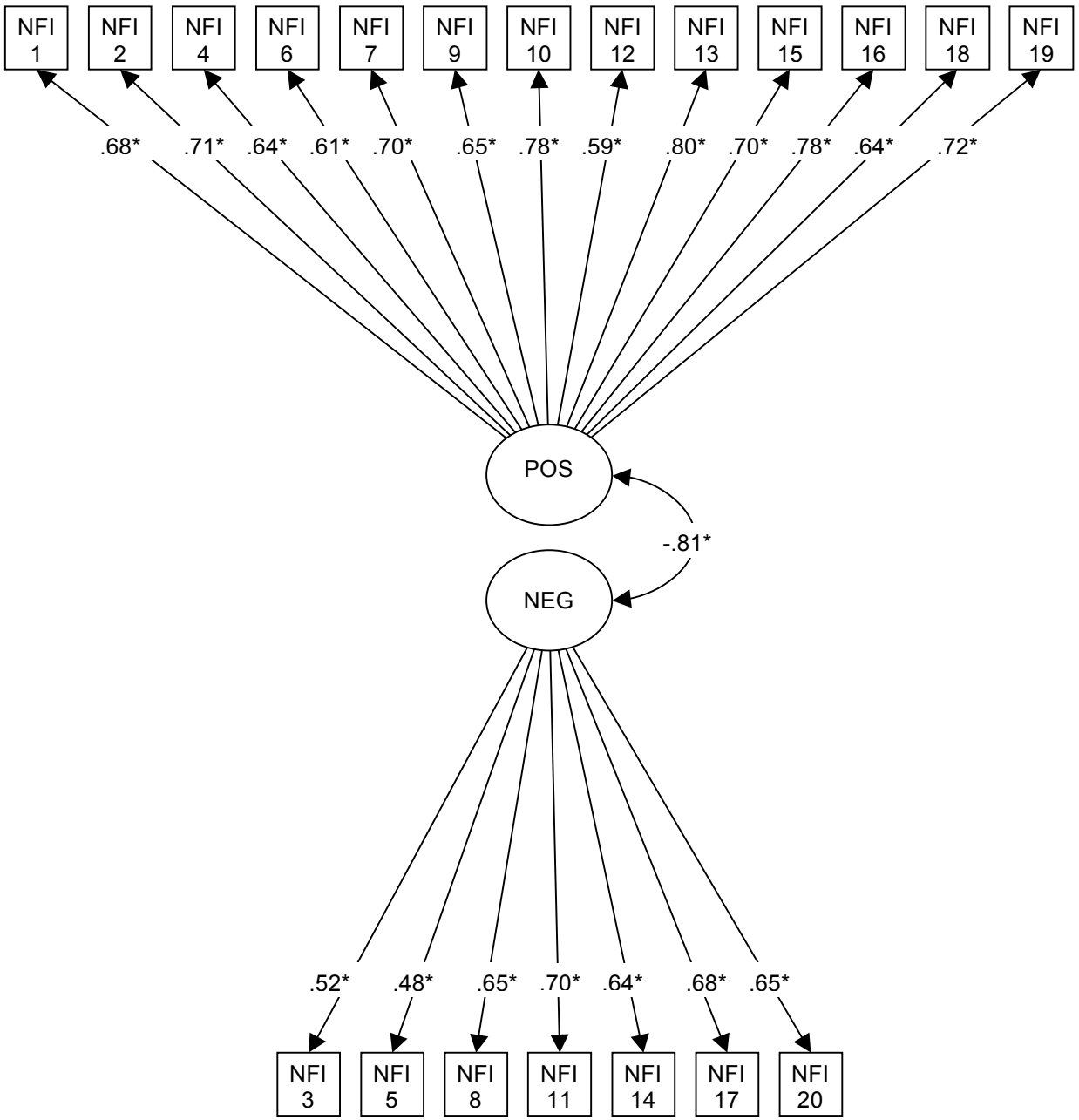


Figure B2.1. Confirmatory Factor Analysis for Attitudes Towards Scientists scale.

Notes: Error terms for the measurement model were not included for clarity but can be obtained by the formula 1-λ2.

POS = Positive. NEG = Negative.

* = $p < .001$.

As shown in Figure B2.1, the items of the AIS factor into two groups, with negatively worded items loading onto one factor, and positively worded items on the other. Both factors are significantly highly correlated (r = -.81), which does indicate that although there are 2 factors, they each explain 64% of the variance in the other.

Analysis of the Attitudes towards Tall Poppies scale

The 20 items of the Tall Poppy Scale (TPS) were subjected to a factor analysis using SPSS version 14 to validate whether the scale comprised of the reported two factors of Favour Fall and Favour Reward (Feather, 1989a). Items in the Favour Reward subscale were reversed as suggested by Feather. Prior to performing the factor analysis the suitability of the data was assessed. Inspection of the correlation matrix revealed many coefficients at .3 or above. Kayser-Meyer-Oklin measure of sampling adequacy was .87, exceeding the recommended value of .6 (Kaiser, 1970, 1974) and Bartlett's Test of Sphericity (Bartlett, 1954) was significant ($\chi^2 = 2584.94$, $df = 190$, $p < .001$) supporting the factorability of the correlation matrix.

Factor analysis using the maximum likelihood method revealed the presence of four components with eigenvalues exceeding 1, explaining 21.18 percent, 12.11 percent, 3.47 percent, and 2.52 percent of the variance respectively. Upon investigation of Catell's scree test (Catell, 1966), it was decided to retain two components for further analysis due to the clear break after the second component. To aid in the interpretation of the two components, Varimax rotation was performed as the items were not highly correlated, and the components had a correlation of $r = -.20$. The solution is presented below in Table B2.2.

Table B2.2

Factor Loadings for all Tall Poppy Scale items using Maximum Likelihood Factor Analysis and Varimax Rotation

Item	*Factor 1*	*Factor 2*	*Communality*
18	.71*	-.23	.56
8	.66*	-.06	.43
13	.63*	-.02	.40
3	.62*	-.20	.43
19	.61*	-.22	.42
15	.61*	.03	.37
10	.59*	-.05	.35
2	.55*	-.12	.32
7	.48*	-.09	.23
5	.43*	.12	.20
11	.09	.64*	.42
17	-.13	.64*	.42
16	-.06	.61*	.37
12	-.07	.58*	.34
1	-.05	.53*	.28
6	-.01	.52*	.28
9	.07	.48*	.23
4	-.18	.41*	.20
20	-.20	.40*	.20
14	-.14	.31*	.12
18	.71*	-.23	.56
8	.66*	-.06	.43
Eigenvalue	3.68	2.91	
(% total variance)	(18.38)	(14.54)	

Notes: $N = 484$.

* = Significant factor loadings

Two clear factors emerged from the analysis, with all Favour Fall items loading onto factor 1 and the Favour Reward items loading onto factor 2. The two factor solution explained a total of 32.91 per cent of the variance, with factor 1 contributing 18.38 percent and factor 2 contributing 14.54 percent. The factor structure was identical to the established Favour Fall and Favour Reward components derived by Feather (1989a). As such, the scale was assumed to be reflective of its initial developed state.

Analysis of the Attitudes towards Scientists scale

Initial Exploratory Factor Analysis

The 10 items of the Attitudes Towards Scientists (ATS) were subjected to a factor analysis using SPSS version 14 to validate whether the scale comprised of two factors similar to the bipolar scale used by Feather and colleagues (Feather, 1989a; Feather, 1993c, 1993d; Feather & McKee, 1992; Feather, et al., 1991). Prior to performing the factor analysis the suitability of the data was assessed. Inspection of the correlation matrix revealed many coefficients at .3 or above. Kayser-Meyer-Oklin measure of sampling adequacy was .82, exceeding the recommended value of .6 (Kaiser, 1970, 1974) and Bartlett's Test of Sphericity (Bartlett, 1954) was significant ($\chi^2 = 1037.86$, $df = 45$, $p < .001$) supporting the factorability of the correlation matrix.

Factor analysis using the principal components method revealed the presence of two components with eigenvalues exceeding 1, explaining 34.15 percent and 14.42 percent of the variance respectively. Upon investigation of Catell's scree test (Catell, 1966), it was decided to retain two components for further analysis due to the clear break after the second component. To aid in the interpretation of the two components, Varimax rotation was performed as the items were highly correlated, and the components had a correlation of $r = .68$. The solution is presented below in Table B2.3.

Table B2.3

Factor Loadings for all Attitudes Towards Scientists items using Principle Components Factor Analysis and Varimax Rotation

Item	Factor 1	Factor 2	Communality
Friendly	0.77*	0.03	0.60
Trustworthy	0.05	0.62*	0.39
Pleasant	0.67*	0.28	0.53
High integrity	0.61*	0.29	0.45
Follows the rules	0.06	0.65*	0.42
Unassuming	0.73*	0.01	0.53
In touch with the average person	0.25	0.47*	0.28
Quiet achiever	0.63*	0.19	0.44
Concerned for Others	0.14	0.77*	0.61
Polite	0.24	0.74*	0.60
Eigenvalue	3.42	1.44	
(% total variance)	(34.15)	(14.42)	

Notes: $N = 476$

* = Significant factor loadings

Two clear factors emerged from the analysis, with one factor comprising of Friendly, Pleasant, High Integrity, Unassuming, Quiet Achiever, and the other factor consisting of Trustworthy, Follows the rules, In touch with the average person, Concerned for Others, and Polite. The two factor solution explained a total of 48.57 per cent of the variance, with Factor 1 contributing 31.15 percent and Factor 2 contributing 14.42 percent. Whilst the solution is a two factor structure and not a clear representation of previous research by Feather and colleagues, it is closely aligned with Feather's research on political leaders and authoritarianism (Feather, 1993c). Reliability for Factor 1 was moderate ($\alpha = .75$) whilst reliability for Factor 2 was ($\alpha = .70$). A Confirmatory Factor Analysis was conducted to test whether this structure was a good fit with the data.

Initial Confirmatory Factor Analysis

The model, which estimated 21 parameters with 476 cases was found to be a poor fit with the data (χ^2 = 108.99, *df* = 34, $p < .001$, IFI = .78, CFI = .77, RMSEA = .07 [90% CI .05 - .08]) is presented in Figure B1.2.

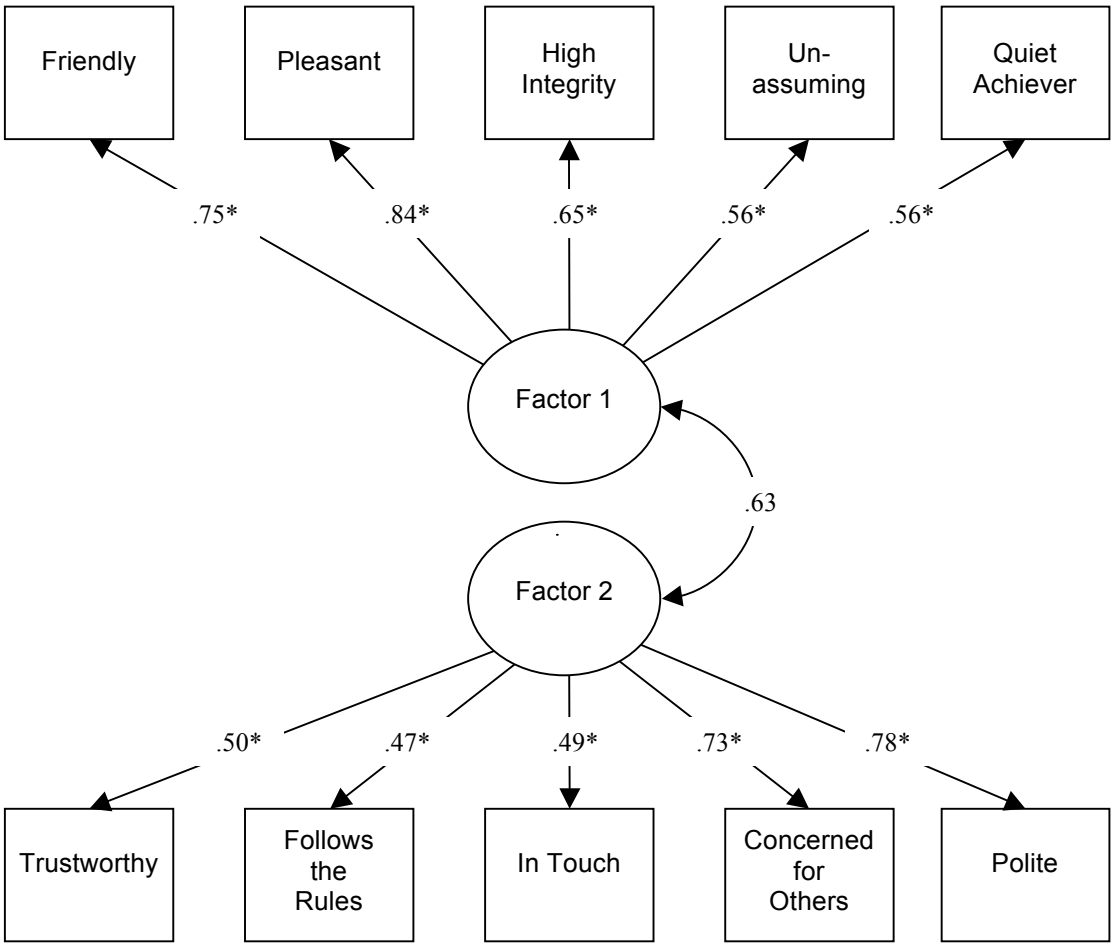


Figure B2.2. A Two Factor Confirmatory Factor Analysis for Attitudes Towards Scientists scale.
Notes: Error terms for the measurement model were not included for clarity but can be obtained by the formula 1-λ2.
* = $p < .001$

As shown in Figure B2.2, the measure of attitudes towards scientists was not a good fit with the data even though there were a lot of items that had high Standardised Regression Weights. As such, it was decided that inline with Study 1, a single factor solution to represent attitudes towards scientists would be used.

Final Exploratory Factor Analysis

The 10 items of the Attitudes Towards Scientists (ATS) were subjected to a forced single solution factor analysis using SPSS version 14. Assumptions were upheld, and identical to the previous Exploratory Factor Analysis. The solution is presented below in Table B2.4.

Table B2.4

Factor Loadings for all Attitudes Towards Scientists items using Principle Components Factor Analysis and a Forced 1 Factor Solution

Item	Factor 1	Communality
Friendly	0.58*	0.34
Trustworthy	0.46*	0.21
Pleasant	0.68*	0.47
High integrity	0.64*	0.41
Follows the rules	0.48*	0.23
Unassuming	0.54*	0.29
In touch with the average person	0.50*	0.25
Quiet achiever	0.60*	0.36
Concerned for Others	0.63*	0.39
Polite	0.68*	0.46
Eigenvalue	3.42	
(% total variance)	(34.15)	

Notes: $N = 476$

* = Significant factor loadings

The items all loaded significantly on the single forced factor, and it explained a total of 34.15 per cent of the variance. The reliability of the attitudes towards scientists items was higher ($\alpha = .78$) than either of the previous two factors in the other analysis.

Analysis of the Schwartz Value Scale

The Schwartz Value Scale was analysed to examine if the structure of the values were similar to the extant research. Table B2.5 and Table B2.6 present both the descriptives and intercorrelations of the higher order values relating to the value dimensions of Conservation and Openness to Experience.

Table B2.5
Means and Standard Deviations for all Values

Items	*M*	*(SD)*	Reliability	Theoretical Range
Openness Values Total	4.56	1.06	.78	-1 – 7[a]
Stimulation	3.93	1.41	.67	-1 – 7[a]
Self Direction	5.19	1.03	.71	-1 – 7[a]
Conservation Values Total	4.76	.95	.78	-1 – 7[a]
Security	5.21	.98	.58	-1 – 7[a]
Conformity	5.05	1.21	.72	-1 – 7[a]
Tradition Maintenance	4.03	1.24	.48	-1 – 7[a]

Notes: $N = 466$.
Range[a]: 7 = of supreme importance; 6 = very important; 5,4, were unlabeled; 3 = important; 2,1, were unlabeled ; 0 = not important; -1 = opposed to my values)

Table B2.6
Correlations for all Values

Measures	ST	SD	CO	SE	CF	TR
Openness	.74**	.75**	-.50**	-.32**	-.36**	-.26**
Stimulation		.10*	-.36**	-.30**	-.25**	-.11*
Self-Direction			-.38**	-.18**	-.28**	-.27**
Conservation				.63**	.66**	.61**
Security					.34**	-.07
Conformity						.11*

Notes: $N = 466$.
* = $p < .05$, ** = $p < .01$
ST = Stimulation, SD = Self-Direction, CO = Conservation, SE = Security, CF = Conformity, TR = Tradition.

Looking at the descriptives from Table B2.5 it appears that most of the higher order values are approaching or exceeding the “very important” rating of

the value as a guiding principle in their lives. In addition, the correlations presented in Table B2.6 (which have been centred to correct for item response tendencies) suggest that the motivational goals of Conservation and Openness to Experience are diametrically opposed. Furthermore the correlations between Openness to Experience and its two higher order values of Stimulation and Self-Direction are in the expected direction, as are the three higher order values (i.e., Security, Conformity, and Tradition) with its respective Conservation dimension.

Appendix B3

Analysis of Order Effects for Study 2

A one-way between-groups multivariate analysis of variance was performed to investigate whether there was an effect of order on the means of the variables. Nine dependent variables were used: the Need for Intellection scale, both factors of the attitudes towards tall poppies scale, attitudes towards scientists scale, and the three conservative values of tradition, conformity, and security. The independent variable was order: order 1 comprised of attitudes towards scientists, Need for Intellection scale, attitudes towards tall poppies scale, and the value items, whilst order 2 was the same except that attitudes towards scientists was the final scale. Preliminary assumption testing was conducted to check for normality, linearity, univariate and multivariate outliers, homogeneity of variance-covariance matrices, and multicollinearity. Nine cases were deleted, as they were classified as multivariate outliers. There was no statistically significant difference across orders on the combined dependent variables: F (7, 450) = .204, p = .984; Wilks' Lambda = .99; $\eta^2 p$ = .003. When the results for the dependent variables were considered separately, there was also no significant difference across orders. Further analysis was conducted on the relationship amongst the variables by looking at parallel slopes (Cohen, 1988).

A test was conducted to compare the statistical significance of the difference between correlation coefficients across orders. The difference in Z scores are presented below in Table B3.1.

Table B3.1

Z score differences for Attitudes Towards Scientists, Need for Intellection Scale, Tall Poppy Scale, and Values across survey orders

Item	ATS
TPS	TPS
Favour Fall	0.40
Favour Reward	0.58
NFI Total	0.03
Values	
Tradition	0.21
Security	0.35
Conformity	0.63

Notes: N = 230 (order 1), 228 (order 2).

ATS = Attitudes Towards Scientists, TPS = Tall Poppy Scale, NFI = Need for Intellection Scale.

Order 1 = ATS, NFI, TPS, Values. Order 2 = NFI, TPS, Values, ATS.

* = $p < .05$, ** = $p < .01$

Overall there were no significant differences between the correlations with attitudes towards scientists across the orders.

Appendix C1

Study 3 Vignettes

Intellectual scientist working in Human Embryonic Stem Cell Research

In the following section, there are two small paragraphs that describe **scientists** working in an emerging field. Take a moment to read the description of the scientist, the field of research that they work in, and their job role. Then proceed to answer a series of items on the following page based on Chris and the scenario.

> Chris works at a biotechnology company in Australia called Clone-Drone. The organisation is a successful start up business that is recognised world wide for its cutting edge research and applications in embryonic cloning. Cloning is the process of making a genetically identical human being through nonsexual means. Clone-Drone is perfecting the process by which a person's DNA is used to grow an embryonic clone from an enucleated egg (i.e., an egg that has had its nucleus removed). The cells from this clone can be used to grow replacement organs and tissue (e.g., hearts, livers, and skin), as well as enabling the development of neurons for research into treatment of disorders where neuronal death occurs (e.g., Alzheimer's and Parkinson's). Chris, the scientist in charge of the project, is interested in expanding and pushing the boundaries of embryonic cloning, continuing the analysis and critique of established techniques to stay at the frontier of this emerging field.

Pragmatic scientist working in Nanotechnology

Once again, take a moment to read the description of the scientist, the field of research that they work in, and their job role. Then proceed to answer a series of items on the following page based on Alex and the scenario.

> Alex works at a biotechnology company in Australia called Mini-Med. The organisation is a successful start up business that is recognised world wide for its cutting edge research and applications of nanotechnology in the medical field. Nanotechnology is the process of developing new materials and processes by manipulating molecular and atomic particles. Mini-Med is applying nanotechnology to research and develop smaller power systems for bionic implants and prostheses. These developments will lead to the creation of smaller, lighter, durable, and reliable implants for the use in pacemakers, auditory and visual aids, and in prosthetic limbs (e.g., used to operate the hand, wrist and elbow). Alex, a gifted practical scientist, is only interested in carrying out the nanotechnology project tasks on bionic implants and prostheses and is indifferent about developing or pushing the boundaries of the research.

Pragmatic scientist working in Human Embryonic Stem Cell Research

In the following section, there are two small paragraphs that describe **scientists** working in an emerging field. Take a moment to read the description of the scientist, the field of research that they work in, and their job role. Then proceed to answer a series of items on the following page based on Chris and the scenario.

> Chris works at a biotechnology company in Australia called Clone-Drone. The organisation is a successful start up business that is recognised world wide for its cutting edge research and applications in embryonic cloning. Cloning is the process of making a genetically identical organism through nonsexual means. Clone-Drone is perfecting the process by which a person's DNA is used to grow an embryonic clone from an enucleated egg (i.e., an egg that has had its nucleus removed). The cells from this clone can be used to grow replacement organs and tissue (e.g., hearts, livers, and skin), as well as enabling the development of neurons for research into treatment of disorders where neuronal death occurs (e.g., Alzheimer's and Parkinson's). Chris, a gifted practical scientist, is only interested in carrying out the tasks on embryonic cloning project and is indifferent about developing or pushing the boundaries of the research.

Pragmatic scientist working in Nanotechnology

Once again, take a moment to read the description of the scientist, the field of research that they work in, and their job role. Then proceed to answer a series of items on the following page based on Alex and the scenario.

> Alex works at a biotechnology company in Australia called Mini-Med. The organisation is a successful start up business that is recognised world wide for its cutting edge research and applications of nanotechnology in the medical field. Nanotechnology is the process of developing new materials and processes by manipulating molecular and atomic particles. Mini-Med is applying nanotechnology to develop smaller power systems for implants and prostheses. These developments will lead to the creation of smaller, lighter, durable, and reliable implants for the use in pacemakers, auditory and visual aids, and in prosthetic limbs (e.g., used to operate the hand, wrist and elbow). Alex, the scientist in charge of the project, is interested in expanding and pushing the boundaries of nanotechnology in the field of bionic implants and prostheses, continuing the analysis and critique of established techniques to stay at the frontier of this emerging field.

Appendix C2

Development of the Attitudes Towards Scientists Scale

The descriptive statistics for the 13 initial attitude items across both scenario and intellectuality are presented in Table C2.1 and Table C2.2 respectively.

Table C2.1

Means and Standard Deviations for all Attitudes Towards Scientists across Scenario

Items / Scenario	Nanotechnology		HESCR	
	M	*(SD)*	*M*	*(SD)*
Self Centered				
Honest	4.59	(1.05)	4.46	(1.08)
Polite	4.61	(0.93)	4.26	(0.91)
Trustworthy	4.65	(1.20)	4.34	(1.13)
Concerned for others	4.70	(1.29)	4.14	(1.38)
Pleasant	4.27	(1.10)	4.24	(1.00)
Unassuming	4.10	(1.05)	3.87	(1.15)
Follows the rules	4.52	(1.39)	4.21	(1.71)
Good Mixer				
Self Controlled	3.71	(1.26)	3.90	(1.23)
Attractive	4.47	(1.26)	4.77	(1.42)
Unemotional	4.65	(1.19)	4.49	(1.09)
In touch with average	3.73	(1.41)	3.25	(1.49)
High Integrity	4.23	(1.21)	3.81	(1.19)
Friendly	4.45	(1.18)	4.29	(1.25)

Notes: N = 194.
HESCR = Human Embryonic Stem Cell Research.

Table C2.2

Means and Standard Deviations for all Attitudes Towards Scientists across Intellectuality

Items / Intellectuality	Intellectual[a]		Pragmatic[b]	
	M	*(SD)*	*M*	*(SD)*
Self Centered				
Honest	4.34	(1.13)	4.70	(0.96)
Polite	4.44	(0.91)	4.44	(0.94)
Trustworthy	4.44	(1.18)	4.55	(1.16)
Concerned for others	4.59	(1.31)	4.25	(1.34)
Pleasant	4.12	(1.08)	4.39	(0.99)
Unassuming	3.91	(1.05)	4.06	(1.13)
Follows the rules	3.78	(1.35)	4.94	(1.51)
Good Mixer				
Self Controlled	4.59	(1.31)	4.25	(1.34)
Attractive	4.67	(1.19)	4.80	(1.11)
Unemotional	4.20	(0.88)	3.85	(0.86)
In touch with average	3.99	(1.04)	3.57	(1.18)
High Integrity	4.16	(1.26)	3.85	(1.26)
Friendly	4.77	(1.28)	4.57	(1.29)

Notes: [a]*N* = 96-97 depending on scenario, [b]*N* = 97-98 depending on scenario.

The 13 items that respondents evaluated on the semantic differential space are presented in two evaluation dimensions, Self Centered and Good Mixer as per previous research by Feather and colleagues (Feather, 1989a; Feather, 1993c, 1993d; Feather & McKee, 1992; Feather, et al., 1991). These two dimensions form the theoretical basis for the present EFAs.

Two factor solutions

The 13 items of the attitudes towards high achievers scales were subjected to multiple factor analyses across scenario type (i.e., Nanotechnology and HESCR) using SPSS 14. The analyses were in part an attempt to replicate Feather and colleagues

consistent structure based on which people evaluated high achievers across two dimensions.

Prior to performing the factor analysis the suitability of the data was assessed, and the correlation matrix for each high-achiever revealed varying levels of coefficients at .3 or above – indicating the suitability for factor analysis. The Kayser-Meyer-Oklin measure of sampling adequacy was .74 to .79 for Nanotechnology scientist and Embryonic Stem Cell scientist respectively; both Kayser-Meyer-Oklin values exceeded the recommended value of .6 (Kaiser, 1970, 1974). The assumption of sphericity was also upheld, thus supporting the factorability of the correlation matrix, with Bartlett's test (1954) being significant across the Nanotechnology (χ^2 = 591.94, df = 78, p < .001) and Embryonic Stem Cell (χ^2 = 598.87, df = 78, p < .001) scenario respectively.

Factor analysis using the principle components method and varimax rotation was performed on each of the eight high achievers scales. Interestingly, Catell's scree test (Catell, 1966) indicated a difference in the position of the elbow between intellectuals and non intellectuals. That is, the bend in the elbow was after one factor for the HESCR scenario and generally after 2 or more factors for the Nanotechnology scenario. An initial EFA was conducted to assess whether the items grouped into the suggested theoretical factors. Table C2.3 shows the factor loadings and reliabilities of the forced two factor solution presented below.

Table C2.3

Factor Loadings and Reliabilities for Attitudes towards Scientists items using Principle Components Factor Analysis and Varimax Rotation

Items / Scenario	Nanotechnology		HESCR	
	F1	F2	F1	F2
Self Centered (F1)				
Honest	0.31	0.59	0.56*	0.55*
Polite	0.71*	0.24	0.60*	0.34
Trustworthy	0.51*	0.36	0.40*	0.60*
Concerned for others	0.62*	0.42*	0.69*	0.07
Pleasant	0.10	0.66*	0.62*	0.23
Unassuming	0.57*	0.04	0.57*	0.11
Follows the rules	-0.21	0.39	0.04	0.49*
Reliability (alpha)	.66	–	.70	–
Good Mixer (F2)				
Self Controlled	0.65*	-0.01	0.19	0.46*
Attractive	0.53*	-0.53*	0.40*	-0.48*
Unemotional	0.08	0.19	0.54*	-0.51
In touch with average	0.71*	-0.03	0.68*	-0.08
High Integrity	0.17	0.59*	0.51*	0.15
Friendly	-0.02	0.77*	0.69*	0.04
Reliability (alpha)	–	.46	–	.56

Notes: * Indicates significant factor loadings > .40.
HESCR = Human Embryonic Stem Cell Research.
Reliability refers to reliability of items as predicted by theoretical assumptions.

The results presented in Table C2.3 indicate no discernable pattern when comparing the Nanotechnology scenario and the HESCR scenario. Furthermore, the theoretically predicted factors are not supported with some items loading across both factors and others not loading on any. The reliability statistics for each predicted factor are also low, with the Self Centered factor marginally more reliable when compared to the Good Mixer factor. As such it was decided to force a single factor solution for all 13 items, and then remove items according to the following criteria. The criteria for examining whether items were suitable were based on factor loading

and a priori conditions. The condition for the inclusion of items was that it needed to load significantly for both scenarios. Skewness values were also examined, and item deletion statistics would be taken into account such that if the reliability coefficient would need to improve if the item were to be deleted.

One factor solutions

The thirteen items across the eight attitudes towards high achievers scales were analysed using a single factor forced EFA, and are presented in Table C2.4. The Kayser-Meyer-Oklin statistics and Bartlett's test are the same as before for the two factor solution. Table C2.5 presents an analysis of skewness for the thirteen items across the eight high achiever types.

Table C2.4
Factor Loadings and Reliabilities for all Attitudes Towards Scientists items using a 1 Factor Principle Components Factor Analysis Forced Solution

Items / Scenario	Nanotechnology	HESCR
Honest	0.61*	0.71*
Polite	0.71*	0.67*
Trustworthy	0.63*	0.57*
Concerned for others	0.75*	0.68*
Pleasant	0.49*	0.66*
Unassuming	0.48*	0.57*
Follows the Rules	0.08	0.19
Self Controlled	0.51*	0.32
Attractive	0.09	0.23
Emotional	0.18	0.35
In touch with the average person	0.55*	0.62*
High Integrity	0.50*	0.53*
Friendly	0.46*	0.67*
Reliability (alpha)	.71	.77

Notes: * Indicates significant factor loadings > .40.
HESCR = Human Embryonic Stem Cell Research.

Table C2.5
Skewness Statistics for Items across Scenario

Items / Scientist	Nanotechnology	HESCR
Honest	-0.18	0.26
Polite	2.40*	1.42
Trustworthy	-1.19	0.27
Concerned for others	-1.43	0.41
Pleasant	-1.06	-0.70
Unassuming	0.37	-0.07
Follows the Rules	-1.26	-0.67
Self Controlled	-2.48*	-0.86
Attractive	-2.50*	-1.84
Emotional	-1.00	0.54
In touch with the average person	-1.81	0.89
High Integrity	-0.86	-4.81**
Friendly	-2.47	0.42

Notes: * p < .01. ** p < .001.
HESCR = Human Embryonic Stem Cell Research.

As seen in Table C2.4, all of the items loaded onto the single factor across both scenarios with the exception of Follows the Rules (Bends the Rules), Attractive (Unattractive), and Emotional (Unemotional). The only difference between the 10 final items in are the inclusion of Honest (Dishonest), Self-controlled (Quick Tempered), and exlusion of Follows the Rules (Behnds the Rules) and Quiet Achiever (Boastful Achiever) in Study 3 when compared with Study 2 (see Table B2.4). Analysis of reliability statistics also indicated that the reliability of each scale would increase with the removal of these items. The skewness values presented in Table C2

Table C2 only showed one item that was very significantly skewed ($p < .001$), High Integrity (Low Integrity). Whilst there were a few other significantly skewed items ($p < .01$), they were not deemed to be serious. Taking these tests into consideration, it was decided to remove these three items and perform another single factor solution with the remaining 10 items. This is presented in Table C2.6.
Table C2.6

Factor Loadings and Reliabilities for remaining 10 Attitudes Towards Scientists items using a 1 Factor Principle Components Factor Analysis Forced Solution

Items / Scientist	Nanotechnology	HESCR
Honest	0.62*	0.72*
Polite	0.71*	0.69*
Trustworthy	0.64*	0.59*
Concerned for others	0.75*	0.68*
Pleasant	0.50*	0.66*
Unassuming	0.47*	0.55*
Self Controlled	0.51*	0.36
In touch with the average person	0.53*	0.60*
High Integrity	0.49*	0.53*
Friendly	0.46*	0.66*
Reliability (alpha)	.77	.80

Notes: * p < .01. ** p < .001.
HESCR = Human Embryonic Stem Cell Research.

As seen in Table C2.6 there was a modest increase in the reliabilities for both the Nanotechnology and HESCR scenarios. The Kayser-Meyer-Oklin measure of sampling adequacy was .74 to .79 for Nanotechnology scientist and Embryonic Stem Cell scientist respectively; both Kayser-Meyer-Oklin values exceeded the recommended value of .6 (Kaiser, 1970, 1974). The assumption of sphericity was also upheld, thus supporting the factorability of the correlation matrix, with Bartlett's test (1954) being significant across the Nanotechnology (χ^2 = 471.13, df = 45, p < .001) and Embryonic Stem Cell (χ^2 = 497.89, df = 45, p < .001) scenario respectively. On the whole this is a much more parsimonious and homologous fit across the both scenarios.

Appendix C3

Covariate Multi-Level Models for Study 3

A series of Multi-Level models to check for covariates were tested at both Level 1 (context) and Level 2 (individual). The first series of models are presented in Table C3.1, and investigate any order effects on attitudes. Table C3.2 shows the results from the models looking at the effects of individual predictors on attitudes.

As seen in Table C3.1, there were no significant effects of orders on attitudes. This meant that attitudes towards the scientist target were comparable across all scenarios, controlling for any effect of presentation order on attitudes. Table C3.2 shows the results from the individual level predictors that were screened as covariates. Only Age was a significant predictor of attitudes towards scientists. The result, , β = -.01 *SE* = .00, implied there was a small significant effect of age on attitudes towards scientists; such that, older participants were less favourable towards scientists in general. This model with age, Model 2, was a significant improvement in fit over the base model as well, $\Delta LL = 8.88$, $df = 1$, $p < .01$.

Table C3.1

Multilevel model parameter estimates for attitude towards high achievers

Parameter	Model 1	Model 2	Model 3	Model 4	Model 5	Model 5	Model 5
Intercept	4.38 (.04)	4.40 (.04)	4.38 (.04)	4.37 (.04)	4.37 (.04)	4.39 (.04)	4.40 (.04)
Level 1 (Context)				Fixed Parameters			
Order 1		-.11 (.11)	—	—	—	—	—
Order 2			-.04 (.10)	—	—	—	—
Order 3				.06 (.11)	—	—	—
Order 4					.11 (.10)	—	—
Order 5						-.02 (.10)	—
Order 6							-.09 (.11)
Level 1 (Context)				Random Parameters			
Intercept	.37 (.04)	.37 (.04)	.37 (.04)	.37 (.04)	.37 (.04)	.37 (.04)	.37 (.04)
-2*log likelihood	803.48	802.34	803.33	803.14	802.38	803.45	802.78
df	1	2	2	2	2	2	2

Note: *$p < .05$, $N = 194$

Table C3.2

Multilevel model parameter estimates for attitude towards high achievers

Parameter	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Intercept	4.38 (.04)	4.72 (.12)	4.46 (.12)	4.51 (.12)	4.33 (.10)	4.51 (.12)	4.42 (.12)	4.41 (.08)
Level 2 (Individual)				Fixed Parameters				
Age		-.01*(.00)	—	—	—	—	—	—
Gender			-.13 (.08)	—	—	—	—	—
Education				-.00 (.02)	—	—	—	—
Employment					.01 (.02)	—	—	—
Current Study						-.10 (.09)	—	—
Residence							-.14 (.20)	—
Religiosity								-.01 (.04)
Level 2 (Individual)				Random Parameters				
Intercept	.11 (.04)	.09 (.03)	.10 (.04)	.10 (.04)	.10 (.04)	.10 (.04)	.11 (.04)	.10 (.04)
-2*log likelihood	803.48	794.60	800.79	803.45	803.07	802.30	803.01	796.711
df	1	2	2	2	2	2	2	2

Note: *$p < .05$, $N = 194$

Gender, 1 = female, 2= male. Education, 1 = University attendance, 2 = no University attendance

Appendix D1

Study 1 Questionnaire Version A

Attitudes towards Australian groups

SWINBURNE UNIVERSITY OF TECHNOLOGY

Dear Participant,

Thank you for taking the time to participate in this survey, it is greatly appreciated. My name is Mathew Marques and I am a PhD student in psychology at Swinburne University of Technology. I am conducting research that hopes to gain an understanding of what people think about Australian groups. I am particularly interested in finding out how perceptions differ across various positions or jobs. It is hoped that this information, along with other studies in my research, will contribute to a better understanding of people's attitudes towards Australian groups.

The survey involves answering a number of questions that ask you what you think about categories of Australians. There are also some questions that ask about your feelings towards others and their achievements, as well as some that relate to your general background. When answering questions, your first selection is often the best one for the choice responses. Upon completing all parts of the survey it would be appreciated if you could seal it inside the envelope provided and return it via mail, or hand it in to the corresponding mailbox on the 7th floor of the BA building at the Hawthorn campus. Please remove this page before returning the survey, as it is yours to keep with contact information.

There is no possible way that you can be identified by your responses to this survey. The results of the study will be communicated to others through the calculation of group statistics, such as percentages and proportions. Therefore the data will not be used to examine individuals, only groups of people. Your anonymity is therefore completely assured at all times throughout the project. There is no reason for you to write any identifying information on the following pages. The results of the study will be used as part of my PhD degree at Swinburne University of Technology, and could eventually be published in a scientific journal.

PTO

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

The Senior Investigator
Mathew Marques
Faculty of Life and Social Sciences
mmarques@swin.edu.au

or c/o my Supervisor

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

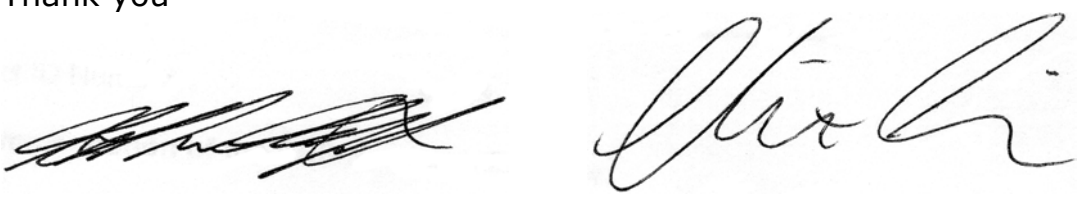
In the event that you have any complaint about the way this study has been conducted, or a query that the Senior Investigator or Supervisor is unable to satisfy, please write to:

The Chair,
Dr. Bruce Findlay
Faculty of Life and Social Sciences Ethics Committee,
Swinburne University of Technology,
Mail no: 24,
P O Box 218
HAWTHORN. VIC. 3122.

Or

The Chair
Human Research Ethics Committee
Swinburne University of Technology
P O Box 218
HAWTHORN. VIC. 3122.

Thank you



Mathew Marques, BA (Hons) and Christine Critchley, Ph.D.

Background information about you

The following information is needed so that we can gain a general description of who participated in the survey. Please indicate your current situation by filling in the blanks, circling the number, or ticking the options that best suit you.

1. What is your gender?

☐ Female ☐ Male

2.What is your age?

_____

3. What is your current employment status? (circle all that apply)

1. Unemployed
2. Part-time employment
3. Full-time employment
4. Part time parenting
5. Full time parenting
6. Part time student
7. Full time student
8. Retired
9. Other (please specify)

_____

4. What is your occupation? (please specify)

_____

5.What is the highest education level you have achieved or finished so far? (circle all that apply)

1. Primary
2. Some secondary
3. Completed Secondary
4. Trade Qualification
5. TAFE or Diploma level
6. Incomplete tertiary
7. Tertiary Degree
8. Postgraduate Degree
9. Other (please specify)

_____

6. Are you currently enrolled in Study ?

☐ Yes ☐ No

If Yes, specify what course you are studying (e.g., Bachelor of Arts, Bachelor of Social Science)

Course:_____

_____

Major(s):_____

7. Apart from weddings, funerals, and baptisms, about how often do you attend religious services?

1. Never
2. Less than once a year
3. Several times a year
4. At least once a week

8. What is you place of birth?

(country) _____

If you were born outside of Australia, how long have you been here? (years) _____

PART 1

On the following pages are a number of characteristics typically used to describe people. The persons listed in this questionnaire are Australian Scientists, TV Celebrities, University Academics, and Professional Sportspersons.

Circle the appropriate number to indicate the description that you think best describes the person of each group. For example, if you consider **Australian Scientists** to be much more arrogant than unassuming, you would circle a 6 or 7. If you think they are more unassuming than arrogant, you would circle 1 or 2. If you consider that they are both unassuming and arrogant, circle 4. When responding to each item try and think of your general impression of each group.

I think Australian Scientists are …								
Unfriendly	1	2	3	4	5	6	7	Friendly
Trustworthy	1	2	3	4	5	6	7	Untrustworthy
Pleasant	1	2	3	4	5	6	7	Unpleasant
Low Integrity	1	2	3	4	5	6	7	High Integrity
Bends the rules	1	2	3	4	5	6	7	Follows the rules
Unassuming	1	2	3	4	5	6	7	Arrogant
In touch with average person	1	2	3	4	5	6	7	Out of touch with average person
Concerned for others	1	2	3	4	5	6	7	Self-centered
Polite	1	2	3	4	5	6	7	Rude
Honest	1	2	3	4	5	6	7	Dishonest
Unemotional	1	2	3	4	5	6	7	Emotional
Attractive	1	2	3	4	5	6	7	Unattractive
Self Controlled	1	2	3	4	5	6	7	Quick Tempered

I think Australian TV Celebrities are …								
Unfriendly	1	2	3	4	5	6	7	Friendly
Trustworthy	1	2	3	4	5	6	7	Untrustworthy
Pleasant	1	2	3	4	5	6	7	Unpleasant
Low Integrity	1	2	3	4	5	6	7	High Integrity
Bends the rules	1	2	3	4	5	6	7	Follows the rules
Unassuming	1	2	3	4	5	6	7	Arrogant
In touch with the average person	1	2	3	4	5	6	7	Out of touch with the average person
Concerned for others	1	2	3	4	5	6	7	Self-centered
Polite	1	2	3	4	5	6	7	Rude
Honest	1	2	3	4	5	6	7	Dishonest
Unemotional	1	2	3	4	5	6	7	Emotional
Attractive	1	2	3	4	5	6	7	Unattractive
Self Controlled	1	2	3	4	5	6	7	Quick Tempered

I think Australian University Academics are …								
Unfriendly	1	2	3	4	5	6	7	Friendly
Trustworthy	1	2	3	4	5	6	7	Untrustworthy
Pleasant	1	2	3	4	5	6	7	Unpleasant
Low Integrity	1	2	3	4	5	6	7	High Integrity
Bends the rules	1	2	3	4	5	6	7	Follows the rules
Unassuming	1	2	3	4	5	6	7	Arrogant
In touch with the average person	1	2	3	4	5	6	7	Out of touch with the average person
Concerned for others	1	2	3	4	5	6	7	Self-centered
Polite	1	2	3	4	5	6	7	Rude
Honest	1	2	3	4	5	6	7	Dishonest
Unemotional	1	2	3	4	5	6	7	Emotional
Attractive	1	2	3	4	5	6	7	Unattractive
Self Controlled	1	2	3	4	5	6	7	Quick Tempered

I think Australian Professional Sportspersons are …								
Unfriendly	1	2	3	4	5	6	7	Friendly
Trustworthy	1	2	3	4	5	6	7	Untrustworthy
Pleasant	1	2	3	4	5	6	7	Unpleasant
Low Integrity	1	2	3	4	5	6	7	High Integrity
Bends the rules	1	2	3	4	5	6	7	Follows the rules
Unassuming	1	2	3	4	5	6	7	Arrogant
In touch with the average person	1	2	3	4	5	6	7	Out of touch with the average person
Concerned for others	1	2	3	4	5	6	7	Self-centered
Polite	1	2	3	4	5	6	7	Rude
Honest	1	2	3	4	5	6	7	Dishonest
Unemotional	1	2	3	4	5	6	7	Emotional
Attractive	1	2	3	4	5	6	7	Unattractive
Self Controlled	1	2	3	4	5	6	7	Quick Tempered

PART 2

In this part of the survey, we are interested in your opinion regarding how **Australian Scientists** have achieved their position. Listed below are a number of causes which may lead to a person obtaining a particular position or job. When thinking about **Australian Scientists**, please indicate on the scales below, how important you think each cause was in obtaining their position. For example, if you think that **Australian Scientists** achieved their present position through hard work and effort, you would circle a 6 or 7. If you think that hard work and effort was not important as a cause in obtaining their position, you would circle a 1 or 2. There are no right or wrong answers, and it is not a test of your knowledge; we are simply interested in your general impressions.

Australian Scientists	Not important as a cause						Extremely important as a cause
Achieved their position through opportunity or luck	1	2	3	4	5	6	7
Achieved their position through hard work and effort	1	2	3	4	5	6	7
Achieved their position through help from others	1	2	3	4	5	6	7
Achieved their position through ability and talent	1	2	3	4	5	6	7

Australian TV Celebrities	Not important as a cause						Extremely important as a cause
Achieved their position through opportunity or luck	1	2	3	4	5	6	7
Achieved their position through hard work and effort	1	2	3	4	5	6	7
Achieved their position through help from others	1	2	3	4	5	6	7
Achieved their position through ability and talent	1	2	3	4	5	6	7

Australian University Academics	Not important as a cause						Extremely important as a cause
Achieved their position through opportunity or luck	1	2	3	4	5	6	7
Achieved their position through hard work and effort	1	2	3	4	5	6	7
Achieved their position through help from others	1	2	3	4	5	6	7
Achieved their position through ability and talent	1	2	3	4	5	6	7

Australian Professional Sportspersons	Not important as a cause						Extremely important as a cause
Achieved their position through opportunity or luck	1	2	3	4	5	6	7
Achieved their position through hard work and effort	1	2	3	4	5	6	7
Achieved their position through help from others	1	2	3	4	5	6	7
Achieved their position through ability and talent	1	2	3	4	5	6	7

PART 3

Below are a number of statements about successful people. Please indicate your level of agreement to each one by circling the number which best fits your level of agreement.

	I agree very much	I agree on the whole	I agree a little	I disagree a little	I disagree on the whole	I disagree very much
1. People who are very successful deserve all the rewards they get for their achievements	3	2	1	-1	-2	-3
2. Its very good to see very successful people fail occasionally	3	2	1	-1	-2	-3
3. Very successful people often get too big for their boots	3	2	1	-1	-2	-3
4. People who are very successful in what they do are usually friendly and helpful to others	3	2	1	-1	-2	-3
5. At school its probably better for students to be near the middle of the class than the very top student	3	2	1	-1	-2	-3
6. People shouldn't criticise or knock the very successful	3	2	1	-1	-2	-3
7. Very successful people who fall from the top usually deserve their fall from grace	3	2	1	-1	-2	-3
8. Those who are very successful ought to come down off their pedestals and be like other people	3	2	1	-1	-2	-3
9. The very successful person should receive public recognition for his/her accomplishments	3	2	1	-1	-2	-3
10. People who are "tall poppies" should be cut down to size	3	2	1	-1	-2	-3
11. One should always respect the person at the top	3	2	1	-1	-2	-3
12. One ought to be sympathetic to very successful people when they experience failure and fall from their very high positions	3	2	1	-1	-2	-3
13. Very successful people sometimes need to be brought back a peg or two, even if they have done nothing wrong	3	2	1	-1	-2	-3
14. Society needs a lot of very high achievers	3	2	1	-1	-2	-3
15. People who always do a lot better than others need to learn what its like to fail	3	2	1	-1	-2	-3
16. People who are right at the top usually deserve their high position	3	2	1	-1	-2	-3
17. Its very important for society to support and encourage people who are very successful	3	2	1	-1	-2	-3
18. People who are very successful get too full of their own importance	3	2	1	-1	-2	-3
19. Very successful people usually succeed at the expense of other people	3	2	1	-1	-2	-3
20. Very successful people who are at the top of their field are usually fun to begin with	3	2	1	-1	-2	-3

Appendix D2

Study 1 Questionnaire Version B

PART 1

On the following pages are a number of characteristics typically used to describe people. The persons listed in this questionnaire are Australian Scientists, TV Celebrities, University Academics, and Professional Sportspersons.

Circle the appropriate number to indicate the description that you think best describes the person of each group. For example, if you consider **Australian Artists** to be much more arrogant than unassuming, you would circle a 6 or 7. If you think they are more unassuming than arrogant, you would circle 1 or 2. If you consider that they are both unassuming and arrogant, circle 4. When responding to each item try and think of your general impression of each group.

I think Australian Aritists are …								
Unfriendly	1	2	3	4	5	6	7	Friendly
Trustworthy	1	2	3	4	5	6	7	Untrustworthy
Pleasant	1	2	3	4	5	6	7	Unpleasant
Low Integrity	1	2	3	4	5	6	7	High Integrity
Bends the rules	1	2	3	4	5	6	7	Follows the rules
Unassuming	1	2	3	4	5	6	7	Arrogant
In touch with average person	1	2	3	4	5	6	7	Out of touch with average person
Concerned for others	1	2	3	4	5	6	7	Self-centered
Polite	1	2	3	4	5	6	7	Rude
Honest	1	2	3	4	5	6	7	Dishonest
Unemotional	1	2	3	4	5	6	7	Emotional
Attractive	1	2	3	4	5	6	7	Unattractive
Self Controlled	1	2	3	4	5	6	7	Quick Tempered

I think Australian Politicians are …								
Unfriendly	1	2	3	4	5	6	7	Friendly
Trustworthy	1	2	3	4	5	6	7	Untrustworthy
Pleasant	1	2	3	4	5	6	7	Unpleasant
Low Integrity	1	2	3	4	5	6	7	High Integrity
Bends the rules	1	2	3	4	5	6	7	Follows the rules
Unassuming	1	2	3	4	5	6	7	Arrogant
In touch with the average person	1	2	3	4	5	6	7	Out of touch with the average person
Concerned for others	1	2	3	4	5	6	7	Self-centered
Polite	1	2	3	4	5	6	7	Rude
Honest	1	2	3	4	5	6	7	Dishonest
Unemotional	1	2	3	4	5	6	7	Emotional
Attractive	1	2	3	4	5	6	7	Unattractive
Self Controlled	1	2	3	4	5	6	7	Quick Tempered

I think Australian Writers are …								
Unfriendly	1	2	3	4	5	6	7	Friendly
Trustworthy	1	2	3	4	5	6	7	Untrustworthy
Pleasant	1	2	3	4	5	6	7	Unpleasant
Low Integrity	1	2	3	4	5	6	7	High Integrity
Bends the rules	1	2	3	4	5	6	7	Follows the rules
Unassuming	1	2	3	4	5	6	7	Arrogant
In touch with the average person	1	2	3	4	5	6	7	Out of touch with the average person
Concerned for others	1	2	3	4	5	6	7	Self-centered
Polite	1	2	3	4	5	6	7	Rude
Honest	1	2	3	4	5	6	7	Dishonest
Unemotional	1	2	3	4	5	6	7	Emotional
Attractive	1	2	3	4	5	6	7	Unattractive
Self Controlled	1	2	3	4	5	6	7	Quick Tempered

I think Australian Pop Stars are …								
Unfriendly	1	2	3	4	5	6	7	Friendly
Trustworthy	1	2	3	4	5	6	7	Untrustworthy
Pleasant	1	2	3	4	5	6	7	Unpleasant
Low Integrity	1	2	3	4	5	6	7	High Integrity
Bends the rules	1	2	3	4	5	6	7	Follows the rules
Unassuming	1	2	3	4	5	6	7	Arrogant
In touch with the average person	1	2	3	4	5	6	7	Out of touch with the average person
Concerned for others	1	2	3	4	5	6	7	Self-centered
Polite	1	2	3	4	5	6	7	Rude
Honest	1	2	3	4	5	6	7	Dishonest
Unemotional	1	2	3	4	5	6	7	Emotional
Attractive	1	2	3	4	5	6	7	Unattractive
Self Controlled	1	2	3	4	5	6	7	Quick Tempered

PART 2

In this part of the survey, we are interested in your opinion regarding how **Australian Artists** have achieved their position. Listed below are a number of causes which may lead to a person obtaining a particular position or job. When thinking about **Australian Artists**, please indicate on the scales below, how important you think each cause was in obtaining their position. For example, if you think that **Australian Artists** achieved their present position through hard work and effort, you would circle a 6 or 7. If you think that hard work and effort was not important as a cause in obtaining their position, you would circle a 1 or 2. There are no right or wrong answers, and it is not a test of your knowledge; we are simply interested in your general impressions.

Australian Artists	Not important as a cause						Extremely important as a cause
Achieved their position through opportunity or luck	1	2	3	4	5	6	7
Achieved their position through hard work and effort	1	2	3	4	5	6	7
Achieved their position through help from others	1	2	3	4	5	6	7
Achieved their position through ability and talent	1	2	3	4	5	6	7

Australian Politicians	Not important as a cause						Extremely important as a cause
Achieved their position through opportunity or luck	1	2	3	4	5	6	7
Achieved their position through hard work and effort	1	2	3	4	5	6	7
Achieved their position through help from others	1	2	3	4	5	6	7
Achieved their position through ability and talent	1	2	3	4	5	6	7

Australian Writers	Not important as a cause						Extremely important as a cause
Achieved their position through opportunity or luck	1	2	3	4	5	6	7
Achieved their position through hard work and effort	1	2	3	4	5	6	7
Achieved their position through help from others	1	2	3	4	5	6	7
Achieved their position through ability and talent	1	2	3	4	5	6	7

Australian Pop Stars	Not important as a cause						Extremely important as a cause
Achieved their position through opportunity or luck	1	2	3	4	5	6	7
Achieved their position through hard work and effort	1	2	3	4	5	6	7
Achieved their position through help from others	1	2	3	4	5	6	7
Achieved their position through ability and talent	1	2	3	4	5	6	7

PART 3

Below are a number of statements about successful people. Please indicate your level of agreement to each one by circling the number which best fits your level of agreement.

	I agree very much	I agree on the whole	I agree a little	I disagree a little	I disagree on the whole	I disagree very much
1. People who are very successful deserve all the rewards they get for their achievements	3	2	1	-1	-2	-3
2. Its very good to see very successful people fail occasionally	3	2	1	-1	-2	-3
3. Very successful people often get too big for their boots	3	2	1	-1	-2	-3
4. People who are very successful in what they do are usually friendly and helpful to others	3	2	1	-1	-2	-3
5. At school its probably better for students to be near the middle of the class than the very top student	3	2	1	-1	-2	-3
6. People shouldn't criticise or knock the very successful	3	2	1	-1	-2	-3
7. Very successful people who fall from the top usually deserve their fall from grace	3	2	1	-1	-2	-3
8. Those who are very successful ought to come down off their pedestals and be like other people	3	2	1	-1	-2	-3
9. The very successful person should receive public recognition for his/her accomplishments	3	2	1	-1	-2	-3
10. People who are "tall poppies" should be cut down to size	3	2	1	-1	-2	-3
11. One should always respect the person at the top	3	2	1	-1	-2	-3
12. One ought to be sympathetic to very successful people when they experience failure and fall from their very high positions	3	2	1	-1	-2	-3
13. Very successful people sometimes need to be brought back a peg or two, even if they have done nothing wrong	3	2	1	-1	-2	-3
14. Society needs a lot of very high achievers	3	2	1	-1	-2	-3
15. People who always do a lot better than others need to learn what its like to fail	3	2	1	-1	-2	-3
16. People who are right at the top usually deserve their high position	3	2	1	-1	-2	-3
17. Its very important for society to support and encourage people who are very successful	3	2	1	-1	-2	-3
18. People who are very successful get too full of their own importance	3	2	1	-1	-2	-3
19. Very successful people usually succeed at the expense of other people	3	2	1	-1	-2	-3
20. Very successful people who are at the top of their field are usually fun to begin with	3	2	1	-1	-2	-3

Appendix D3

Study 3 Questionnaire Version A

Attitudes towards scientists working in emerging technologies

SWINBURNE UNIVERSITY OF TECHNOLOGY

Dear Participant,

Thank you for taking the time to participate in this survey, it is greatly appreciated. My name is Mathew Marques and I am a PhD student in psychology at Swinburne University of Technology. I am conducting research that hopes to gain an understanding of what people think about scientists. I am particularly interested in finding what people's perceptions are towards Australian scientists working in emerging technologies. It is hoped that this information, along with other studies in my research, will contribute to a better understanding of people's attitudes towards scientists.

The survey involves answering a number of questions that ask you about scenarios involving Australian scientists. There are also some questions that ask about your feelings towards these scientists, as well as some that relate to your general background. When answering questions, your first selection is often the best one for the choice responses. Upon completing all parts of the survey it would be appreciated if you could seal it inside the envelope provided and return it via mail, or hand it in to the corresponding mailbox on the 7th floor of the BA building at the Hawthorn campus (Lilydale students please return the questionnaire to the marked box on the 1st floor of the LA building - under the staff photos). Please remove this page before returning the survey, as it is yours to keep with contact information.

There is no possible way that you can be identified by your responses to this survey. The results of the study will be communicated to others through the calculation of group statistics, such as percentages and proportions. Therefore the data will not be used to examine individuals, only groups of people. Your anonymity is therefore completely assured at all times throughout the project. There is no reason for you to write any identifying information on the following pages. The results of the study will be used as part of my PhD degree at Swinburne University of Technology, and could eventually be published in a scientific journal.

PTO

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

The Senior Investigator
Mathew Marques
Faculty of Life and Social Sciences
mmarques@swin.edu.au

or c/o my Supervisor

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

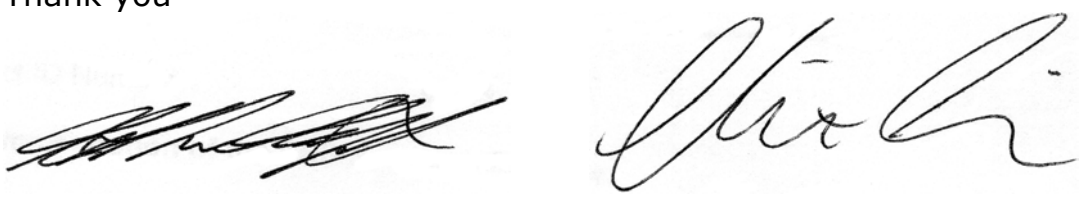
If you have any queries or concerns that Christine Critchley was unable to satisfy, contact:

The Chair, SBS Ethics Committee
Faculty of Life and Social Sciences
Mail H24, PO Box 218
Swinburne University of Technology
Hawthorn, Victoria 3122

If you have a complaint about the way you were treated during this study, please write to:

The Chair, Human Research Ethics Committee
PO Box 218
Swinburne University of Technology
Hawthorn, Victoria 3122

Thank you



Mathew Marques, BA (Hons) and Christine Critchley, Ph.D.

Background information about you

The following information is needed so that we can gain a general description of who participated in the survey. Please indicate your current situation by filling in the blanks, circling the number, or ticking the options that best suit you.

2. What is your gender?

☐ Female ☐ Male

2.What is your age?

_____

3. What is your current employment status? (circle all that apply)

10. Unemployed
11. Part-time employment
12. Full-time employment
13. Part time parenting
14. Full time parenting
15. Part time student
16. Full time student
17. Retired
18. Other (please specify)

_____

4. What is your occupation? (please specify)

_____

6.What is the highest education level you have achieved or finished so far? (circle all that apply)

10. Primary
11. Some secondary
12. Completed Secondary
13. Trade Qualification
14. TAFE or Diploma level
15. Incomplete tertiary
16. Tertiary Degree
17. Postgraduate Degree
18. Other (please specify)

_____

6. Are you currently enrolled in Study ?

☐ Yes ☐ No

If Yes, specify what course you are studying (e.g., Bachelor of Arts, Bachelor of Social Science)

Course:_____

_____

Major(s):_____

7. Apart from weddings, funerals, and baptisms, about how often do you attend religious services?

5. Never
6. Less than once a year
7. Several times a year
8. At least once a week

8. What is you place of birth?

(country) _____

If you were born outside of Australia, how long have you been here? (years) _____

PART 1

In the following section, there are two small paragraphs that describe **scientists** working in an emerging field. Take a moment to read the description of the scientist, the field of research that they work in, and their job role. Then proceed to answer a series of items on the following page based on Chris and the scenario.

Chris works at a biotechnology company in Australia called Clone-Drone. The organisation is a successful start up business that is recognised world wide for its cutting edge research and applications in embryonic cloning. Cloning is the process of making a genetically identical human being through nonsexual means. Clone-Drone is perfecting the process by which a person's DNA is used to grow an embryonic clone from an enucleated egg (i.e., an egg that has had its nucleus removed). The cells from this clone can be used to grow replacement organs and tissue (e.g., hearts, livers, and skin), as well as enabling the development of neurons for research into treatment of disorders where neuronal death occurs (e.g., Alzheimer's and Parkinson's). Chris, the scientist in charge of the project, is interested in expanding and pushing the boundaries of embryonic cloning, continuing the analysis and critique of established techniques to stay at the frontier of this emerging field.

Below are a number of characteristics typically used to describe people. Circle the appropriate number to indicate the description that you think best describes **Chris**. For example, if you consider Chris to be much more arrogant than unassuming, you would circle a 6 or 7. If you that Chris is more unassuming than arrogant, you would circle 1 or 2. If you consider Chris both unassuming and arrogant, circle 4. Go with your initial impression when responding to each item.

I think Chris is …								
Unfriendly	1	2	3	4	5	6	7	Friendly
Trustworthy	1	2	3	4	5	6	7	Untrustworthy
Pleasant	1	2	3	4	5	6	7	Unpleasant
Low Integrity	1	2	3	4	5	6	7	High Integrity
Bends the rules	1	2	3	4	5	6	7	Follows the rules
Unassuming	1	2	3	4	5	6	7	Arrogant
In touch with the average person	1	2	3	4	5	6	7	Out of touch with the average person
Concerned for others	1	2	3	4	5	6	7	Self-centered
Polite	1	2	3	4	5	6	7	Rude
Honest	1	2	3	4	5	6	7	Dishonest
Unemotional	1	2	3	4	5	6	7	Emotional
Attractive	1	2	3	4	5	6	7	Unattractive
Self Controlled	1	2	3	4	5	6	7	Quick Tempered

	Yes	No
Do you think that Chris is successful ?	1	2

Once again, take a moment to read the description of the scientist, the field of research that they work in, and their job role. Then proceed to answer a series of items on the following page based on Alex and the scenario.

Alex works at a biotechnology company in Australia called Mini-Med. The organisation is a successful start up business that is recognised world wide for its cutting edge research and applications of nanotechnology in the medical field. Nanotechnology is the process of developing new materials and processes by manipulating molecular and atomic particles. Mini-Med is applying nanotechnology to develop smaller power systems for implants and prostheses. These developments will lead to the creation of smaller, lighter, durable, and reliable implants for the use in pacemakers, auditory and visual aids, and in prosthetic limbs (e.g., used to operate the hand, wrist and elbow). Alex, the scientist in charge of the project, is interested in expanding and pushing the boundaries of nanotechnology in the field of bionic implants and prostheses, continuing the analysis and critique of established techniques to stay at the frontier of this emerging field.

Below are a number of characteristics typically used to describe people. Circle the appropriate number to indicate the description that you think best describes **Alex**. For example, if you consider Chris to be much more arrogant than unassuming, you would circle a 6 or 7. If you that Chris is more unassuming than arrogant, you would circle 1 or 2. If you consider Chris both unassuming and arrogant, circle 4. Go with your initial impression when responding to each item.

I think Alex is …								
Unfriendly	1	2	3	4	5	6	7	Friendly
Trustworthy	1	2	3	4	5	6	7	Untrustworthy
Pleasant	1	2	3	4	5	6	7	Unpleasant
Low Integrity	1	2	3	4	5	6	7	High Integrity
Bends the rules	1	2	3	4	5	6	7	Follows the rules
Unassuming	1	2	3	4	5	6	7	Arrogant
In touch with the average person	1	2	3	4	5	6	7	Out of touch with the average person
Concerned for others	1	2	3	4	5	6	7	Self-centered
Polite	1	2	3	4	5	6	7	Rude
Honest	1	2	3	4	5	6	7	Dishonest
Unemotional	1	2	3	4	5	6	7	Emotional
Attractive	1	2	3	4	5	6	7	Unattractive
Self Controlled	1	2	3	4	5	6	7	Quick Tempered

	Yes	No
Do you think that Alex is successful ?	1	2

PART 2

The items in below have to do with sources of excitement. Please indicate the degree to which you feel the item is a false or true statement about you by circling a number according to the scale.

Circle the number **1 if** the statement is **completely false for you** **2 if** the statement is **mostly false for you** **3 if** you are **in between** **4 if** the statement is **mostly true for you** **5 if** the statement is **completely true for you**	Completely false	Mostly false	In between	Mostly true	Completely true
1. Working on difficult intellectual problems is enjoyable and stimulating for me	1	2	3	4	5
2. I like the challenges that can be found in the more theoretically-sophisticated university courses	1	2	3	4	5
3. I generally find physical or recreational activities more satisfying than intellectual activities	1	2	3	4	5
4. The process of learning the major concepts in science, history, art, etc., is kind of addictive for me	1	2	3	4	5
5. I tend to feel somewhat bored and impatient when dealing with remote, theoretical problems	1	2	3	4	5
6. I often feel energized by insights I receive during a lecture, or while researching an issue	1	2	3	4	5
7. I often feel energized by insights I receive during a lecture, or while researching an issue	1	2	3	4	5
8. Intellectual discovery is ok, but I prefer other forms of excitement	1	2	3	4	5
9. I'm probably the sort of person who would find it thrilling to be engrossed in a research project	1	2	3	4	5
10. I deliberately seek out sources of intellectual stimulation	1	2	3	4	5
11. Generally speaking, I'm satisfied to 'take things as they are' and leave most of the analysis and theorizing for the specialists	1	2	3	4	5
12. I often experience theories as having a special kind of 'beauty' about them	1	2	3	4	5
13. Just as some people feel a need for physical excitement, I feel a need for thinking and conceptual challenges	1	2	3	4	5
14. I have more exciting things to do than sit around and think all day long	1	2	3	4	5
15. I feel compelled to work on conceptual problems, even when I don't have to.	1	2	3	4	5
16. I have a certain 'inner tension' or need, that is satisfied only through intellectual experiences	1	2	3	4	5
17. Putting a lot of energy into theories and speculation is unpleasant for me	1	2	3	4	5
18. I often enjoy the sensation of 'pushing my brain to the breaking point' in the quest for new concepts and ideas	1	2	3	4	5
19. One of my favourite activities is discovering alternative ways of explaining a particular phenomenon	1	2	3	4	5
20. The process of examining a concept in great detail is generally unappealing to me	1	2	3	4	5

Below is a list of a number of values. Using the scales provided, please circle how important each is to you a guiding principle in your life

	Opposed to My values	Not Important	Important						Very Of supreme
Freedom (freedom of action and thought)	-1	0	1	2	3	4	5	6	7
Sense of belonging (feeling that others care about me)	-1	0	1	2	3	4	5	6	7
Social Order (stability of society)	-1	0	1	2	3	4	5	6	7
An exciting life (stimulating experiences)	-1	0	1	2	3	4	5	6	7
Politeness (courtesy, good manners)	-1	0	1	2	3	4	5	6	7
National Security (protection of my nation from enemies)	-1	0	1	2	3	4	5	6	7
Reciprocation of favours (avoidance of indebtedness)	-1	0	1	2	3	4	5	6	7
Creativity (uniqueness, imagination)	-1	0	1	2	3	4	5	6	7
Respect for tradition (preservation of time- honoured customs)	-1	0	1	2	3	4	5	6	7
Self-discipline (self-restraint, resistance to temptation)	-1	0	1	2	3	4	5	6	7
Family security (safety for loved ones)	-1	0	1	2	3	4	5	6	7
A varied life (filled with challenge, novelty and change)	-1	0	1	2	3	4	5	6	7
Independent (self-reliant, self-sufficient)	-1	0	1	2	3	4	5	6	7
Moderate (avoiding extremes of feeling and action)	-1	0	1	2	3	4	5	6	7
Humble (modest, self-effacing)	-1	0	1	2	3	4	5	6	7
Daring (seeking adventure, risk)	-1	0	1	2	3	4	5	6	7
Honouring of parents and elders (showing respect)	-1	0	1	2	3	4	5	6	7
Choosing own goals (selecting own purposes)	-1	0	1	2	3	4	5	6	7
Healthy (not being sick physically or mentally)	-1	0	1	2	3	4	5	6	7
Accepting my portion in life (submitting to life's circumstances)	-1	0	1	2	3	4	5	6	7
Obedient (dutiful, meeting obligations)	-1	0	1	2	3	4	5	6	7
Devout (holding to religious faiths and belief)	-1	0	1	2	3	4	5	6	7
Curious (interested in everything, exploring)	-1	0	1	2	3	4	5	6	7
Clean (neat, tidy)	-1	0	1	2	3	4	5	6	7

Appendix D4

Study 3 Questionnaire Version B

PART 1

In the following section, there are two small paragraphs that describe **scientists** working in an emerging field. Take a moment to read the description of the scientist, the field of research that they work in, and their job role. Then proceed to answer a series of items on the following page based on Chris and the scenario.

Chris works at a biotechnology company in Australia called Clone-Drone. The organisation is a successful start up business that is recognised world wide for its cutting edge research and applications in embryonic cloning. Cloning is the process of making a genetically identical organism through nonsexual means. Clone-Drone is perfecting the process by which a person's DNA is used to grow an embryonic clone from an enucleated egg (i.e., an egg that has had its nucleus removed). The cells from this clone can be used to grow replacement organs and tissue (e.g., hearts, livers, and skin), as well as enabling the development of neurons for research into treatment of disorders where neuronal death occurs (e.g., Alzheimer's and Parkinson's). Chris, a gifted practical scientist, is only interested in carrying out the tasks on embryonic cloning project and is indifferent about developing or pushing the boundaries of the research.

Below are a number of characteristics typically used to describe people. Circle the appropriate number to indicate the description that you think best describes **Chris**. For example, if you consider Chris to be much more arrogant than unassuming, you would circle a 6 or 7. If you that Chris is more unassuming than arrogant, you would circle 1 or 2. If you consider Chris both unassuming and arrogant, circle 4. Go with your initial impression when responding to each item.

I think Chris is …								
Unfriendly	1	2	3	4	5	6	7	Friendly
Trustworthy	1	2	3	4	5	6	7	Untrustworthy
Pleasant	1	2	3	4	5	6	7	Unpleasant
Low Integrity	1	2	3	4	5	6	7	High Integrity
Bends the rules	1	2	3	4	5	6	7	Follows the rules
Unassuming	1	2	3	4	5	6	7	Arrogant
In touch with the average person	1	2	3	4	5	6	7	Out of touch with the average person
Concerned for others	1	2	3	4	5	6	7	Self-centered
Polite	1	2	3	4	5	6	7	Rude
Honest	1	2	3	4	5	6	7	Dishonest
Unemotional	1	2	3	4	5	6	7	Emotional
Attractive	1	2	3	4	5	6	7	Unattractive
Self Controlled	1	2	3	4	5	6	7	Quick Tempered

	Yes	No
Do you think that Chris is successful ?	1	2

Once again, take a moment to read the description of the scientist, the field of research that they work in, and their job role. Then proceed to answer a series of items on the following page based on Alex and the scenario.

Alex works at a biotechnology company in Australia called Mini-Med. The organisation is a successful start up business that is recognised world wide for its cutting edge research and applications of nanotechnology in the medical field. Nanotechnology is the process of developing new materials and processes by manipulating molecular and atomic particles. Mini-Med is applying nanotechnology to research and develop smaller power systems for bionic implants and prostheses. These developments will lead to the creation of smaller, lighter, durable, and reliable implants for the use in pacemakers, auditory and visual aids, and in prosthetic limbs (e.g., used to operate the hand, wrist and elbow). Alex, a gifted practical scientist, is only interested in carrying out the nanotechnology project tasks on bionic implants and prostheses and is indifferent about developing or pushing the boundaries of the research.

Below are a number of characteristics typically used to describe people. Circle the appropriate number to indicate the description that you think best describes **Alex**. For example, if you consider Chris to be much more arrogant than unassuming, you would circle a 6 or 7. If you that Chris is more unassuming than arrogant, you would circle 1 or 2. If you consider Chris both unassuming and arrogant, circle 4. Go with your initial impression when responding to each item.

I think Alex is …								
Unfriendly	1	2	3	4	5	6	7	Friendly
Trustworthy	1	2	3	4	5	6	7	Untrustworthy
Pleasant	1	2	3	4	5	6	7	Unpleasant
Low Integrity	1	2	3	4	5	6	7	High Integrity
Bends the rules	1	2	3	4	5	6	7	Follows the rules
Unassuming	1	2	3	4	5	6	7	Arrogant
In touch with the average person	1	2	3	4	5	6	7	Out of touch with the average person
Concerned for others	1	2	3	4	5	6	7	Self-centered
Polite	1	2	3	4	5	6	7	Rude
Honest	1	2	3	4	5	6	7	Dishonest
Unemotional	1	2	3	4	5	6	7	Emotional
Attractive	1	2	3	4	5	6	7	Unattractive
Self Controlled	1	2	3	4	5	6	7	Quick Tempered

	Yes	No
Do you think that Alex is successful ?	1	2

PART 2

The items in below have to do with sources of excitement. Please indicate the degree to which you feel the item is a false or true statement about you by circling a number according to the scale.

Circle the number **1 if** the statement is **completely false for you** **2 if** the statement is **mostly false for you** **3 if** you are **in between** **4 if** the statement is **mostly true for you** **5 if** the statement is **completely true for you**	Completely false	Mostly false	In between	Mostly true	Completely true
1. Working on difficult intellectual problems is enjoyable and stimulating for me	1	2	3	4	5
2. I like the challenges that can be found in the more theoretically-sophisticated university courses	1	2	3	4	5
3. I generally find physical or recreational activities more satisfying than intellectual activities	1	2	3	4	5
4. The process of learning the major concepts in science, history, art, etc., is kind of addictive for me	1	2	3	4	5
5. I tend to feel somewhat bored and impatient when dealing with remote, theoretical problems	1	2	3	4	5
6. I often feel energized by insights I receive during a lecture, or while researching an issue	1	2	3	4	5
7. I often feel energized by insights I receive during a lecture, or while researching an issue	1	2	3	4	5
8. Intellectual discovery is ok, but I prefer other forms of excitement	1	2	3	4	5
9. I'm probably the sort of person who would find it thrilling to be engrossed in a research project	1	2	3	4	5
10. I deliberately seek out sources of intellectual stimulation	1	2	3	4	5
11. Generally speaking, I'm satisfied to 'take things as they are' and leave most of the analysis and theorizing for the specialists	1	2	3	4	5
12. I often experience theories as having a special kind of 'beauty' about them	1	2	3	4	5
13. Just as some people feel a need for physical excitement, I feel a need for thinking and conceptual challenges	1	2	3	4	5
14. I have more exciting things to do than sit around and think all day long	1	2	3	4	5
15. I feel compelled to work on conceptual problems, even when I don't have to.	1	2	3	4	5
16. I have a certain 'inner tension' or need, that is satisfied only through intellectual experiences	1	2	3	4	5
17. Putting a lot of energy into theories and speculation is unpleasant for me	1	2	3	4	5
18. I often enjoy the sensation of 'pushing my brain to the breaking point' in the quest for new concepts and ideas	1	2	3	4	5
19. One of my favourite activities is discovering alternative ways of explaining a particular phenomenon	1	2	3	4	5
20. The process of examining a concept in great detail is generally unappealing to me	1	2	3	4	5

Below is a list of a number of values. Using the scales provided, please circle how important each is to you a guiding principle in your life

	Opposed to My values	Not Important	Important						Very Of supreme
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Sense of belonging (feeling that others care about me)	-1	0	1	2	3	4	5	6	7
Social Order (stability of society)	-1	0	1	2	3	4	5	6	7
An exciting life (stimulating experiences)	-1	0	1	2	3	4	5	6	7
Politeness (courtesy, good manners)	-1	0	1	2	3	4	5	6	7
National Security (protection of my nation from enemies)	-1	0	1	2	3	4	5	6	7
Reciprocation of favours (avoidance of indebtedness)	-1	0	1	2	3	4	5	6	7
Creativity (uniqueness, imagination)	-1	0	1	2	3	4	5	6	7
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Self-discipline (self-restraint, resistance to temptation)	-1	0	1	2	3	4	5	6	7
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A varied life (filled with challenge, novelty and change)	-1	0	1	2	3	4	5	6	7
Independent (self-reliant, self-sufficient)	-1	0	1	2	3	4	5	6	7
Moderate (avoiding extremes of feeling and action)	-1	0	1	2	3	4	5	6	7
Humble (modest, self-effacing)	-1	0	1	2	3	4	5	6	7
Daring (seeking adventure, risk)	-1	0	1	2	3	4	5	6	7
Honouring of parents and elders (showing respect)	-1	0	1	2	3	4	5	6	7
Choosing own goals (selecting own purposes)	-1	0	1	2	3	4	5	6	7
Healthy (not being sick physically or mentally)	-1	0	1	2	3	4	5	6	7
Accepting my portion in life (submitting to life's circumstances)	-1	0	1	2	3	4	5	6	7
Obedient (dutiful, meeting obligations)	-1	0	1	2	3	4	5	6	7
Devout (holding to religious faiths and belief)	-1	0	1	2	3	4	5	6	7
Curious (interested in everything, exploring)	-1	0	1	2	3	4	5	6	7
Clean (neat, tidy)	-1	0	1	2	3	4	5	6	7