Design For Social Inclusion:
A study investigating the emotional effects of adaptive cutlery

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“We all feel, sincerely and without misgiving, that we are the more lifted up in spirit for having, even in the privacy of our own household, eaten our daily meal by the help of hand-wrought silver utensils, from hand-painted china (often of dubious artistic value) laid on high-priced table linen. Any retrogression from the standard of living which we are accustomed to regard as worthy in this respect is felt to be a grievous violation of our human dignity.”

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Declaration

This is to certify that this thesis contains no material which has been accepted for the award to the candidate of any other degree or diploma, except where due reference is made in the text of the examinable outcome.

To the best of the candidate's knowledge contains no material previously published or written by another person except where due reference is made in the text of the examinable outcome; and where the work is based on joint research or publications, discloses the relative contributions of the respective workers or authors.

Signed

Gianni Renda
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Abstract

The research highlights the psychological effects that a poorly styled ergonomic aid – specifically cutlery – has on the user. Australian Bureau of Statistics data tells us that in 2006, the “Baby Boomers” formed 27.5% of the total population, which is almost equal to Generation X and Y combined (27.6%) (Statistics, 2006). As this segment ages it is of the public interest to ensure that the environment in which they live meets their physical and psychological needs.

Australian Bureau of Statistics data tells us that 20.1% of the population suffers from some form of arthritis (Pink, 2008). This fact, combined with studies in the United States, show that the uptake of ergonomic aids is low due to their appearance and the social stigma people attach to being labelled as disabled. (Backman et al., 2008), (Theis et al., 2007), (Hunsche et al., 2001).

The research investigates issues relating to the perception of a disability; to evaluate this, data collation utilising a modified form of the room interference protocol, pioneered by Canter (1977), was deployed via paper and online surveys within an international context. The research suggests that female users of adaptive cutlery are more stigmatised; that is, the perception of the female model was seen to be less elegant than the perception of a comparative male model.

The study advances knowledge in the emerging field of disability design and informs designers, manufacturers and health care professionals of the emotional, psychological and socially inclusive benefits of a well-designed implement when used by a sufferer of arthritis.
Evidence that the research gap is significant

The significant problem associated with the uptake of ergonomic devices is related to the issue of aesthetics. Studies suggest that aids are under-utilised due to their appearance; however the review of literature indicates that to date no studies have explored the emotional or psychological effect that poorly designed and styled adaptive cutlery can have on a sufferer of arthritis.

As the intake of food not only has a basic energy value that allows the body to function, it is also an important ritual that encourages interaction and bonding between people; this ritual is commonly undertaken in Western cultures three times a day. Stressors from environmental factors may impact on participation in this ritual and this exclusion may lead to depression and isolation.

The research aims to fill this gap through the exploration of designing for social inclusion; that is detailed, quantitative research on the effect that a piece of cutlery has on the user, based on a spectator's perception. This thesis builds upon the work of Canter, Desmet, Hekkert and Whitfield by contributing further to the area of environmental psychology.
Chapter One: Introduction

This research was undertaken with the aim of highlighting the salutogenic\(^1\) method of promoting health, wellbeing and social inclusion to sufferers of arthritis through the use of adaptive cutlery.

Funding for the research was provided through an Australian Postgraduate Award scholarship issued by the Australian Government and the research for this thesis was carried out at Swinburne University of Technology (henceforth referred as SUT) with the assistance of Dr. Simon Jackson, Dr. Blair Kuys and Prof. Allan Whitfield. SUT’s standing in the international arena of design research and undergraduate training is of a high profile and standard; SUT’s research strengths include emotional design and design anthropology; these areas being highly significant to this thesis.

The aim of the research was to provide a significant contribution to the body of knowledge within the field of product design surrounding the perceptions of ergonomic cutlery, and by association, styling for social inclusion. Within the research, a study was undertaken to investigate the effect that styling of assistive cutlery has on the user, based upon gender. In the following chapters, summarised below, the issue is explored in greater detail.

In Chapter Two a review of the historic background and literature was undertaken, highlighting the importance of food to our culture, the symbolism it bestows upon diners, the social benefits of eating with other people, the physical issues currently surrounding sufferers of arthritis, the magnitude of the issue in relation to the population and the psychological burden it places on sufferers and carers. Exploration of the psychological aspect found poor health and nutrition due to perceived embarrassment and physical pain associated with the inflammation and reduced grip in the joints that arthritis causes. A research gap exists in the relation

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to the measurement of perception of disability in regards to dining, especially on the
effect cutlery can have on the atmospherics and the emotion of the sufferer.

Chapter Three begins with a review of appropriate methods for gathering data that
suits the purpose of the research; the selected method was appropriated from
environmental psychology (the room effect method/room interference protocol).
The room effect method uses three images of the same person; in this case a middle-
to-senior aged man or woman with three different types of cutlery while the
respondent has a survey with twenty-nine questions about their perceptions of the
image. A discussion about the development of stimuli and the issues associated with
this is included. Contrasts between the research undertaken with this thesis and
other international studies are presented.

Chapter Four details the data analysis, specifically the issues surrounding low
respondent pilot surveys (leading to a hypothesised “design student effect”) and the
deployment and subsequent analysis of an internet-based survey, which attracted
international respondents. The survey’s factors were analysed utilising factor
analysis and analysis of variance (henceforth referred to as ANOVA). Issues
surrounding the data gathering and pilot tests were discussed. Discourse of the
results of the studies is also presented, with a clear gap within the body of existing
research identified.

Chapter Five ratifies the product designer’s role in the styling and development of
ergonomic products for social inclusion. A review of the product designer’s role as a
professional is presented; a discussion on how the profession may make strides
towards creating a more adaptive product environment is posed. Emotional design
is investigated, with examples drawn from watch manufacturers, kitchen tools and
magnetic resonance imaging machines. Augmented reality is touched upon and an
experimental development is demonstrated. This chapter highlights the salutogenic
worth that a carefully considered and designed product can have on the user,
further supporting the research.
Chapter Six concludes the research, highlighting the results of the testing and suggests strategies to help inform product designers and companies in the creation of adaptive aids. This may be achieved through the amendment of the ISO standard for cutlery that many nations have signed and ratified. It is hoped that cutlery manufacturers take note and begin to create pieces that are suitable for this large and emerging market segment.

Further research is required in the field of experimental aesthetics to fully explore the possibilities design may hold in the development of medical and adaptive aids for social inclusion. It is hoped that this quest will form the basis for post-doctoral research.
Chapter Two: Literature Review

2.1 Introduction

This chapter seeks to inform and frame the research within both society and academic literature. The study seeks to highlight the importance of food in a social context; the mere consumption and camaraderie shared through the enjoyment of a meal has significant effects on the psychological wellbeing of the individual. Throughout this chapter first we will explore the rituals, performances and links that cuisine and art have to provide a background for the research. Historical explorations show food as a device that can either unite or divide through conspicuous consumption; honouring a guest via elaborate, exclusive feasts, to the exclusion that children face by exile to the “kid’s table”.

An exploration of cultural examples follow. Cutlery in a western context is then explored as a status symbol; throughout history, its aesthetic values and material worth have promoted wealth and status. Then we also explore how it is being used today to enhance culinary experiences in the air. With the cultural issues of food and cutlery established an exploration of the physical manifestations of arthritis is undertaken. Various studies are cited; exploring the issues of sudden onset symptoms of rheumatoid arthritis, the aspect of pain and pain management, grip strength of the user and fatigue.

Psychological issues are investigated, unearthing significant stressors in regards to being unable to perform simple tasks due to the disease. Issues of self worth are common, as are feelings of social isolation due to the physical manifestations of the disease. We then investigate design for disability; what is the perception of assistive devices, what is currently being done to overcome the social stigma of disability, and what methods of development are being used. Leading on from design, a look at luxury completes the chapter.
Luxury is explored from its most basic sense of comfort and we illustrate how design, specifically as a 'luxury' item can provide comfort and a positive social experience to people with a disability.

2.2 Food As Ritual and Art

“The table implements used by the Japanese do not give you any feeling of inferiority, and they do not have to be washed because at the end of the meal you simply throw them away” – Bruno Munari from his essay, Knives, Forks & Spoons (Munari, B. 2008)

The Italian designer and theorist, Bruno Munari, explored the wide assortment of specialist flatware in his essay, 'Knives, Forks & Spoons.' His rationale was that we have become overly complex, requiring an implement for seemingly every kitchen task and that this may make the user feel embarrassed or flustered when selecting the correct implement that good etiquette demands. While his piece was written in a time that may not have considered sustainability as a forethought his notion of universal and inclusive design remains pertinent. A review of ISO 4481, the international standard on nomenclature for cutlery and flatware, defines 21 different spoons, 13 different forks, 15 different knives and 14 other utensils used in food service.

This standard is defined in a Western context; other cultures and customs would use other implements, much like Munari’s suggestion of chopsticks. One glaring omission from the standard, or from any other international standard, is dining for the disabled. Whilst the standard lists include such esoteric items such as a “lobster fork” and a “porridge spoon” – both of these items holding places at the extreme ends of luxury foods - there is a veritable no-man’s land for the disabled. Could the suggestion be that the disabled do not typically enjoy such foods as lobster and therefore do not require such an implement? Alternatively, is the disabled user
unable to find a “porridge spoon”, despite having the needs and the financial position to afford one?

Food and dining are essential to human survival and have been central to our cultural identities for centuries. Van Der Veen suggests that food is a semiotic device; that it can homogenise disparate people via a celebratory feast, such as a wedding or celebration, or heterogenise through status and positioning, much like the “parent’s table” and “child’s table” at social gatherings (Van Der Veen, M. 2003). Through this example, a form of disparity is created. While we could argue that the children feel “special” at their table it can also be argued that their underdeveloped manners, dietary requirements (i.e. not eating the same food or the same number of courses) or physical attributes, such as a baby who may spit and gargle their food, can contribute to the isolating nature of the child’s table. For a person with limited grip strength or a disability the same factors can come into consideration. The inability to use the same cutlery automatically sets the diner apart, and special dietary requirements, specific to a medical condition may require the food to be prepared in a specific way to enable an easier passage from plate to mouth using modified implements. These issues, when taken into Van Der Veen’s context, can certainly raise alarm.

We also see food as a semiotic device in its use of cultural identity. A study by Liu and Jang suggests that restaurants are much like diplomatic missions in that they represent the nation through the decoration of the restaurant, the cuisine, the experience presented by the staff and by the utensils (Liu, Y. & Jang, S. 2009). The study suggests that the ambience and authenticity of the experience is directly linked to our enjoyment and the chance of our return to the experience. This experience is a crucial part of the enjoyment of food; the ability to partake in a meal in authentic surroundings with an authentic atmosphere. This can be disturbed via the disparity discussed above, an isolation or anomaly such as requiring the meal to be processed to allow easier handling or via missing out on the experience altogether due to a possible self-appearance issue.
As much as authenticity is valued there is also the celebrity factor of food that influences our dining behaviour. Cooking shows, such as MasterChef in Australia, are setting television ratings records (Vickery, C. 2010). Celebrity chefs such as Gordon Ramsay and Jamie Oliver command such celebrity that their cookbooks and utensils can be found in almost every department store and specialist cooking shop in the western world. Ferran Adrià and Heston Blumenthal are well known to be the “mad scientists” of the cooking world, inventing foams and emulsions to excite the consumer with new flavours, textures and other unexpected methods of presentation, using a vast array of new and unusual equipment usually found in a laboratory. Blumenthal in particular has popularised the performances in food presentation and consumption in his show “Heston’s Feasts”, where historical feasts or scenarios, such as Tudor England or 1970’s school canteen fare, is re-invented and presented as a performance piece, with remote controlled cloches, re-skinned animals or distilled “chocolate-water” as opposed to simply presenting his diners with a dish, masked by a silver cloche. The restaurants of the chefs discussed are legion; many have been honoured with Michelin Stars and have long waiting lists for tables. Events such as the Melbourne Food and Wine Festival celebrate local and international chefs and heavily promote food, restaurant dining and entertaining at home through the preparation and serving of “celebrity” menus (Wine, M. F. A. 2011).

The serving of a meal can also take the shape of a performance. An excellent juxtaposition of performances is in the serving of duck in an eastern and western context. Peking duck is traditionally served as a nine-course meal (Blumenthal, H. 2007) where different parts of the duck are served as separate courses. In a western context the French have a unique method of serving duck – ‘canard à la rouennaise.’ This method uses an elaborate silver press to crush the roasted duck’s carcass, in front of the diner, to form a blood sauce, which is then served to the party (François-Xavier, 2007); as much a performance as the Chinese method. Both of these methods place an emphasis on both the quality of the meal and the performance of its plating and appearance. These elaborate displays can prove to be limiting for the
home chef due to the equipment used or the skill level of the person. Another limiting factor is of course disability. Fatigue, varying levels of dexterity and self-image may reduce the entertaining and showmanship of the meal significantly.

Aside from the showmanship and presentation of food, food is also inextricably linked to fine art. Michele Delville explores this link in his collection of essays, ‘Food, Poetry and the Aesthetics of Consumption: Eating the Avant Garde.’ From the stereotypical still life portraits of food, painted by various artists, to Andy Warhol’s infamous Campbell’s Soup Cans, we are fascinated by food as an object of art. Delville’s analysis finds much of the literature sexual in tone, as if to suggest that food and sexuality are inextricably linked, both in metaphor and in appearance. Antonio G. Gardoni’s book, ‘Food by Design’, takes some of the design world’s luminaries, such as Ron Arad, Phillipe Starck and Enzo Mari, and asks them to “design” their ideal meals; these range from the mundane to the highly esoteric (in Starck’s case, three boiled eggs with an exotic topping).

However the designers seek to highlight the parallels between good design and good food; that the sensory aspect of the sights, smells and feel are just as important in both cuisine and product. Marije Vogolzang, a member of the Droog Design collective, is instrumental in this particular field. Her pieces not only nourish the diners but also touch upon more poignant ways to bring people together. One piece, entitled “The Green Line,” brought people together from both sides of the horrific Lebanese civil war to bake bowls made of bread, coloured with spinach juice. The bowls were then lined up, reminiscent of the “green line” that separated Beirut, filled with regional foods, and then the participants were invited to eat together – an act of self reflection and reconciliation, to show that they are one people, with the same essential ethnic background (Klanten, R. and Laboratory, F. 2008).

The Italian Futurists felt so impassioned by food and its symbolism that a manifesto was drawn up and codified (Marinetti, F.T. 1930). It is interesting to note that the removal of the most identifying dish, pasta, is front and centre – they regarded the dish as a non-sexual, slovenly dish that was not befitting the Italian race. The
manifesto goes on in great detail, describing how food should be designed for tactile pleasure and to arouse all the senses and that forks and knives starve the person of “pre-labial pleasure”. If the Futurists could see what transpired some 47 years later with the codifying of utensils under an ISO Standard they would be no doubt displeased. One thing they would be pleased with is the rise of chefs like the above-mentioned Ferran Adrià and Heston Blumenthal, with their unconventional approaches to increasing the tactility and sensory pleasure of eating.

Food can also imply comfort. According to Klanten (2008), a greater shift towards “comfort foods” and “granny foods” is increasing (Klanten, R. and Laboratory,F. 2008). The notion of “granny foods” (in a western context) conjures up images of food cooked with great care, passion and of simplicity; a wholesome, hearty meal provided by the elder of the family as a gift to be shared by all. The archetypal British Sunday roast’s importance and ritual is discussed by Marshall (2005); he suggests that this is usually prepared by a domestic cook, usually female, and that the guests are usually the nuclear family seated at the table (Marshall, D. 2005). This cultural ritual places an emphasis on hearty cuisine; roasted meats, potatoes, vegetables and gravy. The simplicity, honesty and home-cooked nature of the food, the “requirement” that all family members are present and the conviviality of the environment lead to memories associated with comfort and comfort eating. Much can be said of “culinary tourism” (which will be explored in the next section) in the same vein – that foreign restaurants provide comfort for expatriates; a place that they can consume the food of their homeland in an environment of familiarity (Liu,Y. and Jang, S. 2009).

In this section, the literature explored the links food has with art and design; how the aroma of a freshly cooked meal can excite the senses in much the same way as a cleverly designed piece of furniture, how the experience of dining can be enhanced through performance and how food can provide comfort and familiarity. The next section deals with cutlery as an essential prop in the experience of dining and as a measure of status that is inextricably linked to the enjoyment of a meal.
2.3 Cutlery As A Historical Status Symbol

“We all feel, sincerely and without misgiving, that we are the more lifted up in spirit for having, even in the privacy of our own household, eaten our daily meal by the help of hand-wrought silver utensils, from hand-painted china (often of dubious artistic value) laid on high-priced table linen. Any retrogression from the standard of living which we are accustomed to regard as worthy in this respect is felt to be a grievous violation of our human dignity.” (Veblen, T. 1965)

Veblen’s landmark 1899 publication, “The Theory of the Leisure Class”, highlighted the importance of the emotional effect and response that high quality utensils bestow toward the user. One hundred and ten years later, a 2009 issue of the lifestyle magazine ‘Queensland Luxury Style’ declares that:

“Fine dining is once again an event; and it is essential to have the perfect cutlery to match every setting” (StyleLivingMagazines, 2009)

These articles, albeit separated by one hundred and ten years, suggest that the enjoyment of food is inextricably tied to the setting, and most importantly, the cutlery used. The above listed article suggests that the act of giving cutlery as a wedding present is in vogue once again and that the attainment of such gifts and the availability of a variety of settings at one’s disposal defines one’s status, both in material possessions and in social circles; i.e. the implication of having multiple sets would indicate frequent entertaining. The ideal of cutlery amplifying the pleasures of the meal goes quite far back into history. While the Italian Futurists denounced the usage of cutlery the first documentary evidence of cutlery’s usage was in Italy in the 11th century, according to Glanville & Young. (Glanville,P. and Young, H. 2002). According to an apocryphal story, cited by Wolfman & Gold (1994), a wealthy Venetian Doge married a Turkish princess. At their wedding the princess brought her elaborate gold cutlery with her to eat her meal with. The Venetians were
outraged at this spectacle, declaring it to be of poor taste and that God had provided the most appropriate tool of all, the fingers (Wolfman and Gold, 1994). However accurate this tale may be, we find that the first story of the usage of cutlery to be discriminatory; that a person who partakes in a meal with a form of utensil different from the norm is discriminated against. Another prominent declaration of a distaste for cutlery is discussed by Glanville and Young, In 1784 noted French geologist and traveller, Barthélemy Faujas de Saint-Fond, expressed his displeasure with pricking his mouth with a fork during a meal:

“...with those sharp little steel tridents...generally used in England”
(Glanville, P. and Young, H. 2002)

Wolfman and Gold suggest by the 14th century cutlery’s prominence began to rise and it was during the 16th century that the Italian noblewoman, Catherine De Medici, wife of the French King, Henry II, introduced the convention of one fork and knife per place setting. Yet this was still considered to be quite a dramatic move. Glanville and Young suggest that cutlery’s rise to prominence was in the 17th century, stating that it was not unusual for diplomats, heads of state and members of the upper echelons of society to travel with their cutlery, much as the Turkish princess of the 11th century did. However, it was during 19th century England where cutlery became the ultimate status symbol, with Victorian feasts necessitating the utilising of a myriad of specialised utensils, beakers and other serveware. The purpose of these was to ensure that the hand never touched the food, which by this time had become a social faux pas. Such elaborate items included forks for piercing and serving bread and so-called “terrapin” spoons, which were designed for consuming the meat and broth in turtle soup. Of course when the utensils were not in use the storage of these implements was just as important.

Historically the cutlery box itself was proudly displayed and ornate in decoration. This is evidenced today in certain period homes; one such example is in Government House, Melbourne. The State Dining Room has an elaborate sideboard with two
cutlery cases housing the finest silver proudly displayed at either end (Victoria, S. O. 2006). Glanville and Young note that displaying these items in concert with other pieces of silver, gold and porcelain conferred status; that it would “dazzle and beguile” the guests (Glanville, P. and Young, H. 2002). Much like Liu and Jang stated above, Glanville and Young note that “culinary tourism” was just as relevant then, with imported and exotic flatware on show, complementing the exotic fare and bestowing a fare more cultured image toward the host and creating an air of luxury and status. This idea of “culinary tourism” is magnified today; with the advent of the aircraft and advanced freight techniques our tastes for the exotic enriches and enhances our lives. One could posit that Australia’s national identity and cuisine have been shaped through “culinary tourism” and the vast numbers of immigrants from Europe, Asia and most recently, Africa. Various airlines have seized upon this unique opportunity and commissioned world-leading designers to design their onboard cutlery. Designers such as Joe Colombo for Alitalia (Gardoni, A. G. 2002), Marc Newson for Qantas (Qantas, 2010) and Phillipe Starck for Air France (France, 2009).

Fig. 2.1. Linea 72 tableware by Joe Colombo and Ambrogio Pozzi for Alitalia (designandfun.com, 2010)
These designers bestow their unique national identity through these pieces carried on their nation’s premier ‘flag-carrier’ airline. Much like Liu and Jang suggest in their research, the careful design and selection of the flatware and crockery onboard the aircraft adds to the dining atmospheric by creating a much more “authentic” dining experience, satisfying both the tourist (who experiences the culture and design of the nation through the meal and serveware) and the homesick traveller, who longs for a reminder of home.
To create such pieces suitable for flight the designer must consider certain parameters: weight, size and shape. As the room on board an aircraft is limited the parameters of constraint can give rise to several innovative and exciting designs’. Similarly the parameters of constraint apply to the design considerations for people with a disability; the weight of the object, the ergonomics and durability. However, unlike the airline cutlery, which is commonly disposed after each meal, little thought is given to the emotional needs of the user with a disability. Are we to say that because a person cannot physically handle or manipulate cutlery they are then forced to use an implement that takes away the experience, the authenticity and the almost sensual pleasure of food?

In this section the literature established cutlery’s significance in the dining experience. It is of relevance to the research that we explore this brief historical overview of cutlery’s evolution as we have established that over the course of approximately 800 years our customs have evolved from considering the use of cutlery as an astonishingly rude display to the height of social stature and proper manners. Its appearance, form and materiality bestow not only style and status to the owner but also may imply national identity and pride. We have seen historical examples in prominent architecture, such as the heritage listed Government House in Victoria where the cutlery and casing was displayed prominently, almost as if it were an artwork. Popular literature tells us that owning several sets of elegant cutlery allows entertaining in style, matching the setting to the occasion and mood. As Veblen so eloquently described, any retrogression of the utensils that we eat, be it in quality, appearance or materiality is “a violation of our human dignity.” In the next section I will explore the facet of human dignity in a context related to cutlery, dining and arthritis.
2.4 The Physical Issues And Scale of Arthritis

In the previous sections we explored food and cutlery in their various forms as a symbolic device; i.e. as a representation of status, of race (through the usage of specialised pieces indigenous to the country or region) and of culture. We have established the importance of the social aspect of dining and the emphasis that cutlery places on style and status. This section provides the rationale for the research – why a focus on arthritis is important and why the development of suitable, aesthetically pleasing cutlery for arthritis sufferers is crucial to increasing social inclusion, self worth and comfort.

First we must create a context for this work; we need to define the physical issues surrounding rheumatoid arthritis (henceforth referred to as RA) and osteoarthritis (henceforth referred to as OA). According to Merriam-Webster (2002), RA is an autoimmune condition that affects primarily the bodies’ joints with swelling, pain, inflammation, stiffness and sometimes the destruction of said joints (Merriam-Webster, I. 2002). OA is the degeneration of the cartilage between the joints, also causing pain, stiffness and distortion of the joint’s position (Merriam-Webster, I. 2010b). Both of these conditions are equally painful and prevalent; Australian Bureau of Statistics (ABS) data tells us that during the 2007–2008 National Health Survey, 15 per cent of the approximately 20,800 respondents suffered from arthritis. This same report tells us that out of these 20,800 respondents, 48 per cent of the age group of 65 and over suffer from arthritis (Statistics, 2009). The Australian Institute of Health and Welfare tells us that arthritis is such a large problem it has become a National Health Priority (NHP)(Welfare, 2010).

Pain is a major concern for sufferers; a 1999 study of 71 patients with osteoarthritis concluded that the female respondents indicated 72 per cent more pain than the males in the group (Affleck et al., 1999). The same study found that men tend to ‘carry-over’ the pain. That is, it would affect their emotional state the next day, intensifying a negative mood. Affleck also found that RA pain was actually ‘greater’
than OA pain, with respondents suggesting that it was 42 per cent greater. Women were also found to experience more daily pain, however they were more open and receptive to using emotional based coping strategies.

Aside from the pain aspect of arthritis, the second most prevalent cause of discomfort in sufferers is from fatigue (Repping-Wuts et al., 2008). Repping-Wuts et al. describes the fatigue as unpredictable with a sudden onset, with possible causes stemming from joint stiffness, decreased grip strength and decreased physical activity. According to the study half of the respondents suggested that the fatigue, with its sudden onset, was actually more bothersome than the pain caused by RA. Hewlett’s 2005 study on fatigue also highlighted the fact that clinicians rarely address fatigue, and the symptoms of fatigue were somehow secondary to the pathological concerns – the swelling, joint degeneration, etc. (Hewlett et al., 2005)

The subsequent effects, as discovered by Hewlett’s study, included further inflammation, pain, anaemia, poor sleep and psychological issues. Furthermore, these effects would be compounded with a reduction of self-esteem, loss of motivation and mental energy. One theory posed by Hewlett is that the fatigue causes the person to work harder to accomplish everyday tasks; this could compound and lead to the emotional stressors discussed above.

The above-presented research suggests the above information is to be taken with caution; when contrasting the opinions of the above scholars there are seen to be conflicting views– for example, one suggests pain is actually secondary to fatigue. In a study by Fagerlind et. al. (2009), we are shown a study where respondents with RA are asked to measure their health and their quality of life. The results of the study were somewhat predictable; the line between health and quality of life were blurred and the understanding of the concepts was dependent on the individual.

Devins et. al. (2009) argue that both pain and fatigue are stressors, but it’s the intrusiveness of the disease and the increase of time taken to perform everyday tasks that causes great discomfort. Devins then suggests that younger sufferers of RA find the disease far more destabilizing due to their age; that the older
respondents accept it as part of the aging process (Devins et al., 2009). A study by Cardol et. al. (2002) of one hundred and twenty-six respondents attempted to quantify the amount of patient discomfort for a select range of diseases: neuromuscular disease, rheumatoid arthritis, spinal cord injury, stroke and fibromyalgia. An IPA (Impact on Participation and Autonomy) survey was undertaken by the respondents and the results found that people with stroke, rheumatoid arthritis or fibromyalgia perceived their pain to be greater in comparison to the respondents from the spinal cord or neuromuscular disorder cohort. Cardol concedes that the groups were not evenly represented (with rheumatoid arthritis having eighteen female respondents and three male respondents) and the results may be in fact an under estimation. Even so, this preliminary study found evidence that:

“Emotional distress was the most important explanatory variable for restrictions in participation in every domain of the IPA (range R² 18.3-33.2%)”. (Cardol et al., 2002)

The R² in the above quote tells us that in Cardol’s analysis, across all ranges of the one hundred and twenty six respondents, the percentage of emotional discomfort was the leading variable. When considering the information presented by Cardol and other scholars within this field, sufferers of RA have demonstrated within the literature that their condition can be at times, dire. The intrusiveness, pain and emotional suffering by RA can be unpredictable; the onset of the symptoms and the disease itself can strike people who are, or may be perceived to be young. Whilst it would be foolish to believe that the field of design may cure the problems posed above, the ability to tailor assistive devices destined to be used by this market is within the scope of a designer; products that may assist the user to perform a task with less exertion or effort but to also may satisfy an emotional want for a “beautiful” product that people disabled by these diseases can be proud of. The following section will explore the psychological and emotional aspects of current
products and how design can assist in satisfying the need of a more sympathetic product solution.

2.5 The Psychological Effects of Arthritis In Context To The Research

In this section, a review of the literature regarding the psychological and emotional aspect of arthritis is undertaken. This exploration indicates that the psychological toll it places on its sufferers is significant, with a lack of independence, self-worth and the inability to fully engage as a parent or grandparent being the main stressors. The act of preparing and consuming food has been identified within the following research as one area where independence and self-worth can be improved, as this act can be seen as one of nurturing, bonding and in certain cases, gift giving.

One of the most debilitating issues of arthritis is the emotional toll it places both on the sufferer and the carer. A joint Polish-German study showed that 94.5 per cent of Polish respondents (n=300) and 62.2 per cent of German respondents (n=137) felt socially isolated due to their lack of independence caused by arthritis (Bugajska et al., 2009). The study suggested that a lack of self worth is resultant of many factors due to RA; lack of physical mobility, lack of ability to perform basic hygienic tasks such as bathing and grooming and the loss of one of the most primal and essential tasks: eating and food preparation.

Other researchers agree; Stamp (2005) points us to studies that show 33–75 per cent of patients with RA are of the belief that diet plays a large role in the treatment of the condition and that 20 to 50 per cent have tried modifying their diets to help alleviate the stress. Furthermore, her investigation into diet and RA demonstrated that fish and fish oils could help in the treatment. Surprisingly, she hypothesised that the placebo effect of altering the diet had an effect on the treatment. Potentially, the ability to still prepare food for themselves and others may subconsciously boost the sufferer’s emotional state and be beneficial in individual patients. As the area of
placebo effect is one of great debate within scientific circles (Evans, D. 2004), the author of this research will attempt to demonstrate a far more detailed and rigorous approach to exploring relationships between issues around food, emotional health and RA.

Literature suggests that food preparation and the mere act of consuming food in a social manner is beneficial and promotes a sense of self worth (Sidenvall et al., 2000). The study by Sidenvall et al. demonstrated that being able to prepare a home-cooked meal for guests gave a sense of great honour and pride amongst the elderly and retired women respondents. One particular article by a South African lady, Deidre’ Matthee, points to the emotions that food preparation can conjure up. As an indigenous female from South Africa, she speaks poetically about the bonding between mother and daughter through the preparation of bread; that a woman who hasn’t kneaded bread with her mother has missed out on a form of bonding (Matthee, D. D. 2004). Another key point highlighted by Matthee is that 'old hands' preparing food endows the food with a special, positive characteristic:

“Look, those are old hands, as folk would say. You can taste it: it’s an old hand who made the food” (Matthee, D.D. 2004)

The above literature suggests that people find a sense of comfort and homeliness when an elder prepares a meal. There is the suggestion that people whose culinary skills are not as adept feel a sense of accomplishment when presenting food that was at least partially prepared by them selves. Norman (2004) explored this in his book, ‘Emotional Design’. He speaks about the issues surrounding Betty Crocker cake mix; how initially it was too easy to prepare by just adding water and then placing the mixture in the oven. The “housewives” as he describes, initially didn’t like this – it didn’t give them the emotional satisfaction or sense of accomplishment that one would achieve through preparing food.
Norman states that the addition of an egg into the preparation procedure tipped the balance back towards the housewives; adding just enough interaction, yet, not over complicating the procedure (Norman, D. 2004).

Sidenvall puts the preparation of food into a context that embraces femininity:

“The whole procedure of preparing a meal could be seen as preparing a gift” (Sidenvall et al., 2000)

‘The gift’ in this case is defined as a work of love to be presented at the table for guests and family. But she also mentions that in her study, elderly, single women are less inclined to give the gift to themselves; they were more likely to prepare food in advance and eat the same thing for days in a row or eat pre-prepared meals (Sidenvall et al., 2000). A quote from Repping-Wuts (2008) highlights the emotional and physical fatigue experienced by one 55-year old respondent:

“My partner has to do the cooking because after my working hours I am totally worn out” (Matthee, 2004, Repping-Wuts et al., 2008)

Andersson et al (2001) looks at the food shopping and eating habits of elderly women with Parkinson’s disease. As this condition has a similar physical manifestation to the sufferer as arthritis (reduced mobility, dexterity and grip strength) the essence of the study is relevant to the research. Andersson suggests that the inability to feed oneself readily, the inability to use cutlery and consume food and drink at the same tempo as their companions leads to increased stress. Whilst eating alone would help the physical side of the condition, allowing the sufferer to eat at their own pace and without embarrassment, the isolation this causes leads to a lack of self esteem. They are no longer able to prepare food for themselves or their families; to give the “gift” of food.
Using data from the Australian Institute of Health and Welfare's 2008 report, ‘Arthritis and Osteoporosis in Australia 2008’, we see a statistic that shows many more women are affected by arthritis than men, specifically in the over 65 bracket (Welfare, 2008). This information, when contrasted with the above literature suggests that the emotional issues related to food preparation and arthritic pain may be of more significance to females, due to the scale and gender distribution of the disease and the reported physical and emotional problems suggested in the literature.

For many people within the older generation, where preparing meals was not only a sense of pride, but also that of duty, these observations are alarming. Literature suggests that the emotional impact of food preparation mainly centres around women and their ability to nurture and provide food for their family, yet, arthritis as a condition can inhibit this and can cause distress through an inability to either prepare or eat food. This can compound into a much larger problem, leading to malnourishment, social exclusion and a loss of self worth (Best, 2008).

Within a sample of the younger generation, a very similar problem exists in the form of parenting. Barlow (1999) suggests that the perception of being a good parent is based upon physical interaction with the child; this could be through play, or as Matthee proposes, through the bonding experience of food preparation. Barlow’s article goes deep into the psychological stressors caused by arthritis; a survey of 142 mothers found that 24 per cent did not meet their own expectations as a parent. When this emotion is combined with post-natal depression and the painful reality of arthritis, it could be hypothesised that the mother would be under immense strain and suffering which could affect not only her own mental health but also that of her child. Two mothers in the survey also didn’t want to accept the diagnosis of arthritis, stating that ‘it wasn’t fair.’ Potentially this could suggest that arthritis struck them too young and at a stage where they were too vulnerable. Fathers were not immune either; many fathers surveyed with RA found that during the ‘flare-ups’ of the
condition they were unable to lift or play with their child as readily or as *expected* by
the child. One father so poignantly called this ‘I let you down again syndrome.’ In
addition to this, Devins et. al. (2009) suggests that there is a significant recognition
of the fact that RA actually deteriorates intimacy and functioning in a spousal role,
especially in the younger generations.

It has been suggested that some people with disabilities are less likely to be involved
in active lifestyles (Rimmer et al., 2004). As we are told from a young age, eating a
balanced diet and exercise are the cornerstone of healthy living. But what if there is
a larger barrier to this? Assuming that the issues surrounding food preparation and
consumption were improved overnight, Rimmer (2004) suggests that other barriers
such as accessibility in public spaces are a major issue. In a survey by Cardinal
(2003) cited by Rimmer, a review of accessibility was conducted in Western Oregon,
USA. The results showed that out of 50 sites, only 8 per cent of exercise facilities, 55
per cent of public drinking fountains and 37 per cent of customer service desks
were considered compliant to accessibility standards. When further investigated by
Rimmer, one of the barriers of creating more accessible places was cost and lack of
space. In the context of the user, disabled people found areas such as that of a
gymnasium or exercise space to be “unfriendly”, which caused self-image issues and
a reluctance to seek assistance.

Danoff-Burg and Revenson present a contrasting view: that RA can actually enhance
one’s life. The study showed that sufferers of RA show positive emotional growth
and that this positivity reduced condition-based flare-ups. The hypothesis from the
study is that having a condition such as RA tended to make the sufferer more
empathetic to other’s needs (Danoff-Burg, S. and Revenson, T. 2005) and that they
enjoyed a greater bonding with their partner and family due to the assistance and
care given. One respondent suggested that the condition made them more aware of
their own fragility and mortality and that each day was a gift. Some respondents
also had become galvanised by the condition, with one 70 year-old respondent
stating:
“...To set an example by not giving in to an affliction” (Danoff-Burg, S. and Revenson, T. 2005)

There are two key possible responses to issues of support with this study, which the Danoff-Burg and Revenson report has clarified. The first is that while social support and an increase in empathy is no doubt a positive thing, there is also the possibility of an increase in the severity of the condition if the help is too overt and the disabled subject reacts adversely. The study suggests that:

“Social support can function as a double edged sword (Revenson et al.,1991), as it can be either protective or detrimental to mental and physical health, depending on whether the support is perceived by the potential recipient as either helpful or unhelpful.” (Danoff-Burg, S. and Revenson, T. 2005)

Another issue that arose from the study is that the claims of experiencing an increase of empathy and finding benefits in the condition might be a façade; that whilst the person may appear to be a willing recipient of care, their own emotional health may be suffering. The overt nature and assistance, as discussed in the above study, is unwelcome for some suffers, and the potential for a subtle, design-led intervention to assist the sufferer in a way that does not stigmatise may be required.

Whilst people with a form of disability may find benefits in less than desirable circumstances, when one is presented with the degradation of their own body due to an acquired or congenital disease, such as arthritis, it is hard to fathom that the person does not suffer emotional trauma. Whist Danoff-Burg and Revenson (2005) suggest that the gift of care brings both the sufferer and the caregiver close together, the aforementioned literature suggests that the sufferer wishes to retain their own dignity and their own autonomy.
When the issues raised above are applied to the number of sufferers of arthritis worldwide, the scale of the problem becomes apparent. It could be argued that sufferers of arthritis are “refugees of exclusion” due to the inconsistent levels of care, disparity of assistive aids and emotional issues related to the disease. Whilst the problem is widespread, the solutions to tackle the problem aren’t. It was suggested within the literature that should a person with arthritis venture from the home there is a very good chance that public spaces, especially ones concerned with health, such as gymnasiums, do not cater for such a clientele. It is also suggested within the literature that there is a risk of further exclusion through embarrassment of their appearance during particular motions and the potential inability to adequately perform a basic human task as eating, cooking and sharing a meal. What is most alarming is that the disease is not limited to the elderly – people of a young to middle age suffer this debilitating condition, making it not just a point of concern for the aged, but for everyone.

This section has investigated a range of psychological issues of arthritis in a context related to dining. The literature suggested that a link between dietary wellbeing and the reduction of symptoms related to RA exists; i.e. studies linking the intake of fish & fish oils in helping abate the flare-ups associated with RA. Psychological aspects of diet and eating were also detailed, with studies and anecdotal evidence linking the preparation and sharing of a meal as a significantly positive psychological event. The inability to perform these tasks led to reduced self worth and an increase in depression, due to the perceived inability to “be a good parent” or “be a good grandparent”. Other aspects of self-image were investigated, such as the projection of a positive self-image, despite the condition causing significant emotional and physical discomfort. The following sections deal with issues surrounding the product design aspect, such as perceived luxury, aesthetics and ergonomics.
2.6 Design For Inclusion

An investigation of the literature around the knowledge of design responses and a visual literature review of the current best practices in assistive aids will be undertaken in this section. This will be done in conjunction with a consideration of the effect aesthetics have on their uptake and the emotional wellbeing of the user. Participatory design is referenced as not only a data gathering exercise but also as a method of designing new products for this market. Finally, emotion in product design is investigated as a way of creating a salutogenic response to the condition; in this instance, the creation of an object that respects and compliments the user, promoting good health and social inclusion.

“Sometimes I cry when I discover something else that is no longer possible for me to carry out” (Matthee, 2004, Repping-Wuts et al., 2008)

The above quote from a sufferer of arthritis provides designers with a call that is hard to ignore. There is a significant gap between aesthetically pleasing and functional products, and products that may be ergonomically sound – however through their appearance, be it colour, form or material – discriminate against the user. So how can design respond to such a situation? Specialist tools are available that can allow sufferers from arthritis to continue to cook and prepare meals. OXO, the ubiquitous British brand has staked a large claim to such an area; “Good Grips” cutlery is revered for its ease of use and its appeal to arthritic sufferers (Council, 2009). However the utensils themselves are quite striking in their appearance – they have black, rubberised surfaces and large, easily gripped handles. Whilst this satisfies the need for an increased grip area to perform the task, perhaps it is missing that key emotional part in the equation. For example it could be argued that the preparer of food has felt empowered by using the utensils, yet, when they set the table and are about to present the “gift” of food, the cutlery they use is potentially different from the others.
The word *potentially* has been highlighted for a reason. Whilst the aforementioned research in this chapter suggests that reduced grip strength may cause stress in the actions of feeding oneself, the issue at hand is of uptake of said devices. The AIHW report suggests that the use of aids for arthritis sufferers is 50 per cent or below for sufferers less than 30 years old up to 74 years old (Welfare, 2008). This could be hypothesised that much like Norman’s “Betty Crocker” example, using “adaptive” arthritic cutlery may be perceived as too easy and childish. A clarification for this argument can be found in de Boer et al. (2009); the article suggests that the usage of such devices was associated with an older age, more severe disease, more severe disability and a greater beneficial effect. It is of note that de Boer’s cohort was of Dutch nationals, and that out of the 240 patients surveyed, 89 per cent had some form of assistive device. This could be evidence of a cultural difference, potentially stemming from a larger availability of well-designed ergonomic aids.

An example of this point can be found in a catalogue of a cutlery retrospective. Whilst the catalogue shows delicate stainless steel and silver forms from various designers, the cutlery for the disabled takes on a more mundane and pedestrian approach (Editore, C. 1997).

*Fig. 2.4 – Images from the disability section of the book, ‘Cutlery’ (Editore, C. 1997).*
However, when contrasted with locally found pieces (Lifehealthcare, 2008) it could be argued that the intrinsic design values found in European countries assists in creating better products.

![Examples of locally available cutlery (Lifehealthcare, 2008).](image)

In de Boer’s study, the main reasons for non usage of the products stemmed from a negative evaluation of the device, its appearance, lack of comfort and a perceived lack of impairment; that is – having an impairment, but not at an advanced stage requiring the use of such implements. This view is ratified by Coleman (2006) who believes that “bad design disables” (Coleman et al., 2006). Further evidence of Coleman’s point was highlighted in his research, quoting from a participatory design workshop he attended:

“*The event flagged up the fact that if people do not like assistive products, or if they look out of place in their homes, then they will not be used.*” (Coleman et al., 2006)

This view echoes the above arguments; poorly designed tools hinder the user and when the user has a disability it has the power to amplify the stigma. Coleman then poses an interesting point regarding the aesthetics of assistive devices:

“*The whole semantic of such products is one of dependency and poverty*”
(Coleman et al., 2006)
A 1993 Swedish study discussed these issues. In it, Benktzon (1993) details that problems stem from the fact that conventional cutlery is designed for the 25-30 year-old professional demographic (Benktzon, 1993). However, on the other hand, knives designed for arthritic users have gained popularity as they allow a greater grip for which bread loaves and such can be sliced with ease. Nordenskiöld et al. (1998) also argues that the uptake of assistive devices is on the increase in Scandinavian countries due to the interest by designers in creating “better” products; that is, products that are easy to use and grip, yet have that desirability factor. It is of note that Benktzon states adaptive aids are supplied to patients in Sweden free of charge, courtesy of the Swedish government, and a ‘Technical Aids Centre’ is located in every county, allowing the citizens to be assisted in their choice of aids by a well trained staff member. This environment may actually reduce the stigmatizing effects by promoting the issue heavily. By supplying the elderly or disabled with the products free of charge, it may actually raise awareness of the aids to their families, who in turn use such devices as the aforementioned breadknife and are without a disability. Therefore helping to eliminate the negative connotations of the product being usable for only the disabled. Acclaimed furniture designer, Jeff Weber, has launched a line of crutches that are customizable with graphics and have the same design and ergonomic considerations as his most famous product, the “Aeron” chair, manufactured by Herman Miller. Whilst Weber’s ideals and ergonomic considerations are incredibly valuable, the system of procuring crutches (usually for short-term convalescence) would require these crutches to replace ones already on the market that are available for hire at chemists and assisted living centers. The customizable skins that Weber offers may also prove problematic; because they would require much more time in the cleaning of the product on its return. Nevertheless; the mere fact that bastions of the design industry are developing products such as these gives hope for disabled users and disability groups; they may finally have “designer” products. Alan Dilani takes an academic approach to a similar scenario as Weber; he states that design should be psychologically supportive and suggests:
“If the sensory appeal is heightened with a pleasing handle, pleasurably tactile and smelling materials, etc. it will increase people’s inclination to make the most of these environmental qualities” (Dilani, A. 2001)

Desmet and Hekkert (2009) take this further, suggesting that when two identical products are compared we choose the one that gives us a greater pleasurable sensation, one that allows the user to be taken on an emotional journey as opposed to using a tool (Desmet, P. M. A. & Hekkert, P. 2009). An example of this is in luxury goods such as a Tiffany & Co. ring; a plain silver ring would perform the same task, however, we may associate the narrative of the Tiffany & Co.’s ring with New York, the book and film ‘Breakfast at Tiffany’s’ and by association, Audrey Hepburn. We may wish to identify ourselves with the mystique and in doing so we use the intrinsic design and branding attributes to shape our lives accordingly.

When contrasting Weber and Dilani’s views with de Boer and Nordenskiöld’s arguments we are seeing a gradual change for the better. De Boer argues that the uptake of devices is inhibited due to the perceived lack of disability by the disabled and the mundane appearance of the device designed for the disabled; Nordenskiöld argues that due to the ease of use and the way some products designed for the disabled have been designed people with no form of disability will purchase and use these products. Clearly it is the emotional “stigma” of being labeled disabled that is the main inhibitor of the uptake of said devices.

“Discreet? She sniggers. I want off the chart glamorous!” – Aimee Mullins to Graham Pullin, (Pullin, G. 2009)

This quote, out of its context, could potentially lead to a few hypotheses. Is Aimee Mullins referring to a new dress, a new pair of shoes or a new car? She is, in fact, referring to her prosthetic legs. Her embracement of her condition creates pause for the reader; is a condition such as being an amputee or having reduced grip actually a
disability? Clearly in the context of Graham Pullin’s book, ‘Design Meets Disability’, the point would be argued not. Aimee Mullins iconic photo has been splashed across the world: a svelte, strong athletic woman who happens to have carbon fibre limbs from the knees down. The ability to accessorise what was once an organic body part is what she embraces – in her talk at the TED conference in 2009, she remarks that her ability to change her height causes an opposite social effect:

“I went to a very fancy party. And a girl was there who has known me for years at my normal 5’8”. Her mouth dropped open when she saw me, and she went, “But you’re so tall!” And I said, “I know. Isn’t it fun?”...And she looked at me, and she said “Aimee, that’s not fair.” (Mullins, A. 2009)

Pullin explores a similar point further in his text; he notes that spectacles, which were once considered a medical device have now become a fashion statement; he notes that up to 25% of glasses purchased have been fitted with non-prescription, clear lenses (Pullin, G. 2009). Products with intrinsic, life-preserving uses such as insulin pumps are also becoming chic; the ‘Hanky Pancreas’ system that is currently under development masks the insulin pump in such a way that it becomes a fashion accessory (Floeh, J. 2010). In this system the user is no longer trying to hide a small device on their person, they are embracing it as an accessory. It is through methods such as this that designers can make significant advances and contributions to the emotional and physical wellbeing of various disabilities. How could this be done? Consider Patrick Jordan’s argument:

“Usability-based approaches then encourage a limited view of the person using the product. This is – by implication if not intention – dehumanizing.” (Jordan, P. W. 2000)

Relating Jordan’s point back to assistive cutlery, the current assistive devices are just that – usable, but by their nature and lack of design – dehumanizing. We have seen the evidence that the uptake of products, especially in footwear is poor (de Boer et al., 2009) due to the appearance of the product. Contrasted with studies
demonstrating the effect that a condition such as arthritis has on social isolation (Barlow et al., 1999, Bugajska et al., 2009) it could be argued the resultant low self-image is not only linked to the condition but also to the assistive devices used to treat the condition.

In this section, we explored current strategies and solutions designers have investigated in regards to disability and assistive devices. While current solutions and examples exist there appears to be a large disconnect between aesthetic and function, especially in the context of an assistive device. Users of accessibility objects and prostheses such as Aimee Mullins, who champion their disability as a form of distinction and accessorisation, or Jeff Weber, who after experiencing the problems associated with mobility used his technical skill to redesign the crutch, help change the perception and apparent belief that people with a disability should not have beautiful objects. The following section deals with this concern in greater detail; an exploration of luxury and what constitutes a luxury in the context of disability.


2.7 Luxury As Emotional Comfort

In this section, luxury in its various forms will be examined; as a modification or improvement of a basic need or product and luxury as a state of mind, as comfort and ease of use. In section 2.6 of this thesis, Coleman (2006) suggested that the aesthetic of assistive devices was one of poverty; this view is also shared by Torrens & Smith (2012), who undertook a qualitative study with the intended users of assistive cutlery and investigated the aesthetics of such devices noted that the appearance was a strong reason for not using the assistive cutlery. Through the aesthetic development and refinement of materiality of the product, the possibility to enhance the user experience through creating a product of desire, much in the same way as a luxury good is desired, is investigated herein.

As discussed earlier in this chapter, the usage and uptake of assistive devices is limited by the outward appearance. A visual review (Appendix 1) was undertaken to help inform the reader of the differing aesthetics of a small range of conventional and assistive cutlery; children’s cutlery was also included within this review, as luxury versions (such as scaled and modified versions) of adult cutlery are developed for this market.

Luxury, and the concept of luxury for persons with a disability are rarely mentioned in the same sentence. Merriam-Webster defines luxury as:

“A condition of abundance or great ease and comfort: sumptuous environment” (Merriam-Webster, I. 2010a)

It would seem that the definition of luxury and the current products available for arthritis sufferers (such as lightweight, foam handled pieces of flatware) would satisfy the first two conditions of luxury; i.e. great ease and comfort. However the term “sumptuous environment” is rarely extended to assistive devices. A visual review of a small range of cutlery was undertaken to further illustrate this point; Appendix 1 demonstrates the visual disparity between cutlery designed for
conventional, able-bodied users and cutlery designed for disabled users. While the handle form and materiality is specific to the needs of the end user – be it larger, foam grips or a specifically weighted handle to reduce tremors – the aesthetic is quite different to that of the conventional. In some cases, regular cutlery is adapted for assistive use through the addition of foam grips that are slid onto the handles. While this allows the user the ability to interact with the same cutlery that others at the table are dining with, the aesthetic of such foam grips are poor.

When contrasted with the children’s cutlery the disparity becomes enormous. Children can dine with Arne Jacobsen’s iconic cutlery. Georg Jensen has provided a scaled down version, suitable for small hands. Are the children aware of the cultural significance of the cutlery as a design icon? While the child’s awareness of the cutlery may be low, their awareness that they are dining with “mum and dad’s” cutlery would not be missed. The miniaturized Jacobsen cutlery leads to inclusion. To demonstrate this let us look at a possible scenario. It is a festive occasion (such as Christmas) and the table is set with the household’s fine china and a variety of sumptuous foods. All of the participants of the meal take their seats and everyone, including the children, has the same fork, knife and spoon, even though their hands are significantly smaller and require a specialised set of cutlery. The children feel included because everyone at the table is using the same cutlery as they are, except there is a slight difference in scale. In effect, the child’s cutlery enhances the “sumptuous environment” through its presence; Clayton (2007) in his book ‘A Butler’s Guide to Table Manners’ suggests that the origin of the term “born with a silver spoon in the mouth” extends from the historic status that silver flatware bestowed on the user. As only the wealthy classes could historically afford such a luxury – feeding the child from a silver spoon – this became a demonstration that the child would be well bred and cultured. Clayton suggests that following on from feeding the child, miniature cutlery, also forged from silver (or in a contemporary setting, stainless steel), would be then utilised as the child’s ability would increase.

The availability of ‘baby’ cutlery and specialised eating apparatus from luxury manufacturers such as Christofle, Georg Jensen, Tiffany & Co. and Hefra provide
validity to this argument. Considering the above, would this environment be different with aeroplane shaped utensils that draw attention to the adolescence of the participant? Unfortunately, the cutlery for arthritis sufferers affords no such qualities.

In a recent study, Chua and Zou (2009) experimented with the effect that exposure to luxury goods had on cognition and decision-making. The results of this study were summed up as:

“...When thinking about luxury, people think to focus more on themselves and less on others” (Chua, R. and Zou, X. 2009)

Chua and Zou also hypothesised that while exposure to luxury goods promote the user’s self interests, they did not conclude that the exposure to such goods induces anti-social tendencies. Relating their point back to Aimee Mullins’ legs, it could be argued that by having the ability to modulate your height could be viewed, and was certainly viewed by her friend, as a luxury. As Mullins discusses in her TED2009 talk, Aimee Mullins accessorises her legs; by doing so she articulates that she is actually “super-abled” and humorously remarks:

“Pamela Anderson has more prosthetic in her body than I do, nobody calls her disabled” (Mullins, A. 2009).

If we contrast Mullins’ comments with Kemp’s (1998) study concerning luxury, we can draw parallels; Mullins own augmentation with exotic replacements for her limbs, as opposed to merely functional ‘stilts’ is in line with Kemp’s summary of Christopher Berry’s (1994) analysis of luxury:

“...That luxuries are refinements of basic human needs such as those for food, shelter and health care” (Kemp, S. 1998)

Designer spectacles fall into the same category that Kemp describes and that we have defined with Mullins’ twelve legs; many people modify their appearance and
augment their disability – be it short-sighted, long-sighted or other vision related issue – with frames and optics by haute-couture fashion houses, automotive designers, adventure and sports brands, as well as individual “star” designers. These modifications of a basic need of health care – the “NHS spectacles” as described by Pullin (2009), have transcended a doctor-ordered prescription and now, due to the various designers’ influences, are a desirable luxury.

It is also interesting that both Berry and Kemp list food as a luxury; Kemp argues that caviar is a luxury food, yet will satisfy the basic human need of providing nourishment and energy (Kemp, 1998). It is of note that caviar is traditionally consumed with a specific spoon usually made of mother-of-pearl, however, one could hypothesise its absence from ISO 4481² is another mark of exclusiveness and rarity, further enhancing Berry and Kemp’s point. Van Der Veen (2003) ratifies this argument and suggests that luxury or prestige foods and their consumption raises the status of the consumer; throughout history the “prestige foods” were traditionally scarce or labour intensive and argues that such foods were reserved for the upper echelons of society (Van Der Veen, M. 2003). It is also of note that there does not appear to be a caviar spoon, specifically designed for the use of a sufferer of limited grip through a disability – perhaps this is one luxury that must be forgone when a disability is acquired?

In this section the literature suggests that since the invention of cutlery it has historically been used a symbol of status and luxury in the upper classes, inextricably linked with feasts, entertaining and of high social standing. The literature also established that through disability one can still find and create luxury; as in the case of Aimee Mullins, who is able to modify her height and modify the appearance of her legs in much the same way people accessorise their shoes and handbag to their outfit. It is hoped that through a sense of luxury, in combination with an excellent ergonomic consideration, a solution to the current issues of adaptive cutlery (low uptake and individualising appearance) can be found.

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² ISO 4481 is the international standard for cutlery and flatware.
2.8 Conclusion

Whilst the human race has made great strides in equality we still fall behind in the social inclusion and integration of disabled people. Arthritis in both forms (rheumatoid arthritis, abbreviated as RA and osteoarthritis, abbreviated as OA) is a disability that afflicts people in their joints, robbing them of their movement and dexterity. Unless the disease is severe, arthritis is a hidden illness; it has no outward signs of disability that may make people uncomfortable. Donald Norman, in his publication ‘The Design of Everyday Things’ advances the notion that products have become overly complex and discriminate against the user. One common comment we find in this book is the quote: “It probably won a prize”, seemingly to justify bad design that ends up discriminating against the user. Norman also argues that there needs to be a balance between usability and aesthetics (Norman, D. A. 2002). It is this challenge, combined with Munari’s point of ‘inferiority through cutlery’, that forms one of the narratives of this thesis; that the styling of assistive products may discriminate against the user.

“Both sovereigns dined two or three times a week in public, but viewers were limited to “persons of good fashion and appearance” (Glanville, P, and Young, H. 2002)

Whilst Glanville and Young present an extreme example (dining with a Regent), the hypothesis of the author is that discrimination of the physical appearance of someone with RA occurs today in much the same way; we like to dine with “persons of good fashion and appearance”. Indeed today, signposts to “good fashion and appearance” can be found in the Michelin Guide, Gault Millau and the Melbourne-centric The Age Good Food Guide. These handbooks demonstrate where the finest cuisine can be found, and by proxy, the finest chinaware, cutlery, atmosphere and potentially, company. Would this ambience be ruined if a disabled person were to dine at these restaurants? Would the act of supplying assistive pieces of cutlery spoil the carefully chosen décor? Or more importantly, would the arthritis sufferer be
forced to eat their meal in discomfort due to the social pressures placed on them because of the surroundings?

The review of the literature suggests that while older people, predominantly female, wish to be included and maintain “usefulness”, the ability to participate in social events, especially in regards to cooking or eating, can be limited by arthritis. The flare-ups from RA, the reduced grip, the chronic fatigue and embarrassment of their appearance and ergonomic aids; all these factors may lead to social isolation. The goal of the research is to reduce this through a change of perception. The literature documents that cutlery is used as measure of status, good manners and style. The literature also reveals an emphasis on the need for self-reliance from arthritis sufferers. A research gap then surrounds the psychology of cutlery; it is in these two areas where a design-led solution can be found.

In the following chapters the perception of arthritic cutlery will be tested. Is the stigma of using such cutlery real; does the population at large actively discriminate and make value judgements of the users of adaptive cutlery?
Chapter Three: Methodology

3.1 Introduction

The research undertaken herein aims to explore the stigmatising effect of adaptive cutlery, and to further the body of knowledge in experimental aesthetics and emotional factors within product design for the disabled. The research also aims to highlight the ancillary factor of the effects of product branding and familiarity. Social exclusion through the aesthetic disparity of ergonomic aids is well documented (Benktzon, M. 1993, Caspari et al., 2006, Coleman, R. and Pullinger, D. J. 1993, Dilani, A. 2001, Pullin, G. 2009, Thyberg et al., 2004) and historically items of cutlery have been used as a symbolic device defining one’s social stature (Glanville, P. and Young, H. 2002, Veblen, T. 1965, Wolfman, P. and Gold, C. 1994). Furthermore, studies have also shown the affect of branded goods on one’s social standing (Han et al., 2010) and the affect they have on one’s cognition and self interest (Chua and Zou, 2009). As the above effects demonstrate, a method of determining the key issues surrounding the aesthetic development of products for the disabled is required.

Further to the literature review, a brief visual review was undertaken. This review highlights some of the problems surrounding the design of the products; children can be given either scaled or modified versions of iconic adult cutlery, yet there does not exist an equivalent for the disabled. The idea of perception and stigma were raised and a method for measuring the levels of stigma was developed.

A survey based on Canter’s (Canter, D. V. 1977) room effect method was developed using a photograph of a woman, aged around 55, with three pieces of cutlery – one “control” set of expensive, traditional cutlery; one set of lightweight, foam-handled...
cutlery, suitable for people with arthritis; and finally, one set of foam & Velcro™ handled cutlery, usually reserved for people with a significant disability. Several images were developed; these images were refined according to suggestions from a convenience sample and a cohort of postgraduate students from Swinburne University of Technology. Two paper-based pilot surveys, using a convenience sample of fifty-seven undergraduate students was undertaken to establish the validity of this method, with an internet-based survey as the primary data gathering method for the research. To measure the potential stigma that the cutlery may impart to the user, an analysis of the “Big Five” personality traits (i.e. extraversion, agreeableness, conscientiousness, neuroticism and openness) is undertaken and its validity within the context of the research is explored within this chapter.

A review of the methods of stimuli generation is also presented; the accuracy and detail undertaken using computer software in this research is contrasted to comparative studies in the field using a similar technique. A discourse on the usage of graphic design software, and the usage of a designer within a research team follows and suggests areas where a utilising a designer can bring to the integrity and consistency to stimuli generation and data gathering.

Further research is suggested to advance the method using emerging or design-related technologies, such as augmented reality. Through this, the resultant data from this study can be utilised to develop virtual prototypes for which both sufferers and non-sufferers can evaluate stylistic alternatives and participate in the design process. An example of this is demonstrated in Section 6.4.1.
3.2 Justification of Method

The literature review suggested that the existing knowledge on adaptive cutlery is heavily reliant on ergonomic data. Heuristics have been used to develop and improve aids for the disabled (Paddison and Englefield, 2004), but in a context related to cutlery there has been very little published research. A focus-group approach was trialled in Sweden (Benktzon, M. 1993), but this research was again focused on the ergonomics of the item and not the aesthetic considerations of the item.

A visual review of cutlery was undertaken as a ‘first step’ in identifying the problems surrounding the aesthetics of assistive cutlery. A web search for cutlery, both assistive and conventional was performed using Google and myriad items are displayed. A small selection of these images is included in Appendix 1.

Within this visual review, a few points become apparent; the typology of a modern fork/knife/spoon is relatively consistent. While differing manufacturers produce a number of designs, the products displayed herein demonstrate that the convention of all-metal (be it silver, stainless steel or silver plate) or metal work surfaces with plastic grips are common. When inspecting the plastic-gripped pieces, the colours of the grip provide us with an interesting contrast between these and the disabled pieces. The conventional cutlery's grips are either black or have primary colours such as reds, blues and yellows, in addition to greens. When contrasted to the assistive cutlery, the colours become much more muted; greys, beiges, whites and blacks become more apparent. The materiality also changes; there is only one entirely metal piece, the rest are either plastic, rubber or foam-gripped. While this is due to specific requirements surrounding grip-related disabilities, comparing these items with children's cutlery raises an interesting contrast – are children, by the nature of smaller hands, weaker grip and having to learn how to eat – disabled? A small selection of children’s cutlery is provided within the appendix and within it, we see colourful – and in the case of the aeroplane fork – allegorical versions of
cutlery. It is also of interest that Georg Jensen provides scaled versions of their iconic pieces for children, however, not for adult users who suffer from many of the same issues, such as limited grip. The adaptive cutlery is distinct, as it cannot be purchased through a regular department store; they need to be specially ordered or procured through a specialist retailer. The appearance of the pieces, when contrasted with the others, is aesthetically lacking. While a cursory investigation of the images can suggest that issues surrounding stigma requires further thought (as suggested by the literature presented earlier within this thesis), a lack of quantitative research on the stigma of assistive cutlery presents an opportunity for investigation.

A participatory design model was debated, however the aim of the research was to determine if the appearance of assistive devices projected a sense of overt disability, much as Pullin (2009) suggested that was once the case with prescription spectacles. While the users of adaptive cutlery are predominantly sufferers of arthritis and their input and contribution is invaluable, the issues surrounding the aesthetics need to be discovered. Much work has been done in regards to ergonomics and significant data exists regarding this, however, the concern of this research is the outward appearance of adaptive cutlery to non-sufferers to allow social inclusion through design.

To ensure this, the focus of the data gathering was shifted towards surveying the public to receive quantitative data, to be used to find consistencies in this research. Therefore, a method that allowed an in-depth approach to investigate specific factors of styling was required, allowing an analysis on the resultant data that can be framed in a product design context.
Canter's (1977) publication, “The Psychology of Place,” contained an experiment in which a montage of a man in different rooms was created:

Each room was found to have an effect on the perceived intelligence, social standing, finances and mental state of the model. While this experiment has its roots in
environmental psychology, it has been used successfully in a design context to illustrate value judgements and perceptions of a model (both Malaysian and Australian models of both sexes), when placed beside images of various cars and motorbikes (Effendi et al., 2009). The rationale in basing the experiment using Canter’s method over a focus group is due to the emphasis on the perception of the person. While Canter’s original experiment used a change of environment to demonstrate the effect that a room has on a person’s perceived age, intelligence and wealth, this experiment uses a subtle change of cutlery to pose an interesting question that is central to this study; do able-bodied people make a value judgement of a disabled person? Does the stigma of using such tools only extend to the person using them?

A study focusing on the stigmatising effect of a food related item was carried out in America; the effect was dubbed the “Imbibing Idiot Bias” (Rick, S. and Schweitzer, M. 2010). This study investigated the effect that an alcoholic beverage has on the perception of a person. A stimulus and questionnaire was developed along Canter’s method, and a convenience sample was surveyed. The method allowed the researchers to determine the apparent intelligence of a person partaking in an alcoholic beverage versus a non-alcoholic beverage. Swinburne University of Technology has also investigated this method of research; Crook, Effendi, Hashim, Jackson and Whitfield presented research in 2009 using this method for water bottle branding, motorcycle branding, automotive styling and positioning and educational institution branding. The results allowed a comprehensive and insightful look at the values the population places on each of these research areas.
3.3 Stimuli Development

The images of the rooms and models used in the room effect method were sourced from stock photography websites and were post-processed in Adobe Photoshop to achieve the required effect. Several revisions were undertaken under the advice of doctoral supervisors. The cutlery selected for the images were chosen due to their appearance; the “elegant” cutlery was defined as a set from David Mellor who is a renowned cutler. The “disabled” cutlery was sourced from a local supplier of assistive devices; these pieces were the most prevalent online and in stores and finally, to further enhance the survey and provide a control, images of strap-on foam grips were added to basic IKEA cutlery; whilst sufferers of arthritis would generally not use these, they represent the most extreme form of adaptive cutlery available. The cutlery was placed on a white table napkin within the three scenarios; while cloth napkins may not be commonly used within the home environment, the stimuli had to be consistent across the three scenarios.

The first images produced included three scenarios detailed overleaf:
The first image presented a woman at a café, reading a menu with the cutlery displayed from the user’s perspective. The following images presented the same woman and utensils, but in differing rooms. The intent was to focus attention on the cutlery and the person in line with the aims of the study; therefore food and other extraneous visual information (such as crockery) were not used in the generation of the images.
Fig 3.3. Draft One: Woman at Home – Author Generated (2010)

Fig 3.4. Draft One: Woman in a “posh” setting – Author Generated (2010)
The images were negotiated with doctoral supervisors for their judgement and approval. The woman was perceived as too young and attractive, the cutlery’s placement was also perceived as being incorrect for the nature of the study. The research aimed to gauge the population’s perception of arthritic people, not from the perceived viewpoint of the sufferer. The stimulus was altered according to the above recommendations. The following images being the new stimuli:

*Fig 3.5. Draft Two: Woman in a café setting (“cheap” cutlery) – Author Generated (2010)*

*Fig 3.6. Draft Two: Woman in a café setting (“expensive” cutlery) – Author Generated (2010)*
The above images presented the viewer with three different cutlery sets, within a café context. The woman was chosen from a stock photography website due to her perceived age and appearance. It was important to not show the hands of the model because this may have jeopardised the result. Three more images were presented in a home scenario:
The sample group once again critiqued the images and slight changes were made. Firstly, for the purpose of the pilot survey the “home” setting was chosen due to the links made in the literature; i.e. the home environment being an area of exclusion. The cutlery was reduced in scale and the “cheap” cutlery was replaced with foam-grips; these are used to modify existing cutlery for use by people with a severe disability. Three drafts were undertaken to ensure the cutlery size and placement were visually appealing.
Fig 3.11. Draft Five: Woman in a home setting ("expensive" cutlery) – Author Generated (2010)

Fig 3.12. Draft Five: Woman in a home setting ("disabled" cutlery) – Author Generated (2010)

Fig 3.13. Draft Five: Woman in a home setting ("arthritic" cutlery) – Author Generated (2010)

These images were used in the pilot survey. The addition of the words “This woman is about to eat her lunch” provided a secondary visual cue on the scenario.
Discussion of the first pilot survey will be undertaken in a following chapter, however, one issue that arose was the perception of the “expensive” cutlery; it was not perceived as conferring a significant amount of style or elegance in the “Big Five” (extraversion, agreeableness, conscientiousness, neuroticism and openness) factor analysis. The cutlery was modified from a modernist typology to a far more traditional set for the next pilot. Again, a positional draft was produced and refined, leading to the seventh draft of the images.

*Fig 3.14. Draft Seven: Woman in a home setting (“arthritic” cutlery) – Author Generated (2010)*

*Fig 3.15. Draft Seven: Woman in a home setting (“disabled” cutlery) – Author Generated (2010)*
After the stimulus with the female model was developed, development began on the male version. The reasoning for this staggered approach was derived from the literature review; that more women than men suffer from arthritis and the psychological stressors related to it\(^3\). This is not to discount the men’s pain or suffering, it was merely a logical progression to allow the pilot study to begin.

As the only change in the stimulus is the model, a select number of middle-to-elderly male models were selected from stock photography websites:

\[^3\] Literature suggests (Association, A. A. R. D. (2013), Sokka (2009) that the increased prevalence of RA in females is due to genetic makeup and that female sufferers report increased stress and pain due to more frequent flare ups when contrasted with males.
From these images four models were selected by a combination of postgraduate research students, supervisors and non-academics and the research team then evaluated the following mock-ups:
Fig 3.19. Male Model One (mock-up) – Author Generated (2011)

Fig. 3.20. Male Model Two (mock-up) – Author Generated (2011)

Fig. 3.21. Male Model Three (mock-up) – Author Generated (2011)
The images were again evaluated using the same techniques discussed prior (consultation with the post-graduate students, supervisors and non-academics) and the resultant “average” model was split between Model One and Model Two. Model One was chosen on the merits of his posture; that it was similar to the female model and his “look” was more age appropriate. The image was then downloaded at a high resolution and the three types of cutlery and tagline added:
To eliminate the potential bias that a smiling model may have on the data, the model's face was digitally altered to be more neutral:
This image was then evaluated by the aforementioned means and was found to be still too positive; the eyes, cheekbones and the shape of his mouth still gave an impression that may influence the integrity of the data. These areas were isolated and digitally altered to appear much more neutral. The following image was produced:

This image then proved to be neutral when assessed by the aforementioned cohort, allowing the other pieces of cutlery to be introduced and the stimuli to be generated:
After rigorous consultation, the images were then signed off by the supervisory team and uploaded to the Internet, via Swinburne University of Technology’s bespoke survey module.
3.4 Design as a viable instrument in data gathering

In Canter's 1977 publication, “The Psychology of Place”, two images were presented; the first image was of a man in an office environment and the second image was of the same man in a domestic environment. A survey was developed and deployed and the results tabulated. This particular publication dealt with developing a stimuli using photomontage that while adequate at the time, had a few flaws. The limitations of photomontage are that fine control of the detail of the image, such as the removal of certain objects or blemishes, can be problematic in the darkroom. Larger scale retouching, such as altering facial expressions, removing or altering background visuals, or including very specific backgrounds or props (some of which do not exist in real life) are virtually impossible using this method.

Digital software, such as the industry standard Adobe Photoshop, allow fine adjustments to the stimuli. This is important, as there have been several studies since Canter's ground-breaking work; some of which do not take the design of the stimuli into great consideration.

A case study of two separate stimuli is presented; the first being a paper presented by the a British cohort, led by Dunn (2010), who used a similar method to Canter to evaluate the level of attractiveness that sitting in different cars bestows upon the person; and the second by an American cohort led by Rick and Schweitzer (2010), who investigated the visual effect that a glass of alcohol, as opposed to a glass of soft drink has on a person.
3.4.1 Contrasts - The British Study

While this study illustrated a very interesting result (that males look more attractive when driving a Bentley vs. a Ford), the stimulus was created with very little consideration to its design. The image is presented below:

![Image](image_url)

*Fig 3.30. Image used in Dunn & Searle’s research, p73 of “Effect of manipulated prestige-car ownership on both sex attractiveness ratings (2010)*

The contrast between the images is quite stark. One image shows more of the car and the position, facial expressions and the lighting of the man are different than in the other image. This can lead to a form of pollution of the stimuli and a compromising factor as part of the data gathering. The differences in the images present the same man in a strikingly different way. In the first image he appears to
be quite prominent in the car, with the lighting of the scene and his face to be quite harsh and “blown out”. In the following image he appears smaller, his facial expression has changed, the lighting of the scene has changed and he appears to have slightly “retreated” into the car due to the way the scene was composited. The female in the two images is also significantly different; in one image the window is half-raised and her face appears to be lighter, whereas in the other image the window is completely retracted and she appears in a different position, with a different expression on her face, which appears much more dark and obscured. Lindgaard (2006) suggests that the human mind is capable of forming a like/dislike conclusion of a stimulus within five-hundred milliseconds (500ms); this is an incredibly fast, in-built reaction in our minds, therefore it is imperative that the stimuli is presented in a way that affords the viewer the most objective view (Lindgaard et al., 2006).
3.4.2 Contrasts - The American Study

In comparison to the British study, this investigation was carried out with far more rigor. An image of two people at a table was displayed; one of the people had an alcoholic beverage in front of them, the other had a soft drink. The viewer was to make a judgement based on the images presented. While the team had gone to great lengths to ensure the images were as close as possible, slight differences can be detected; the alcoholic beverage is “highlighted” by a white napkin “coaster”, whereas the non-alcoholic drink does not have this. An example of this is demonstrated below:

![Image of two people at a table with different beverages]

As we have discussed prior, these small details may subconsciously affect our response – the white napkin may draw the attention to alcoholic beverage faster than without.

Fig 3.31. Image used in Rick and Schweitzer’s (2010) study, indicating the visual difference between beverages.
3.4.3 – Discussion

The designer’s role in this form of data gathering is to ensure these factors are neutralised. Using software such as the aforementioned Adobe Photoshop, the need for models and actual props are mitigated. In the British study the model could have sat for one photo, outside of the car, and then have been digitally composited into both cars. The cars themselves could have been scaled accordingly and presented in a way to ensure that in relative position they were as neutral as possible. The model’s face could have been slightly altered to ensure the face presented was as neutral and expressionless as possible to ensure that no pre judgements about the person’s wellbeing, mental state or other factor could influence the data collection.

Likewise, in the American study the scene could have been shot separately and modified to appear neutral, using retouching methods and tools that are available in Photoshop. Extraneous detail that may influence the viewer could be removed seamlessly from the environment. The models could be shot separately or stock images could be used in their place. This approach could also be used for creating the scene itself, unless a very specific background is required. The models would be composited digitally and altered to ensure that their physical appearance is kept neutral by ensuring that visually their height and weight appears to be similar.

In future data gathering of this nature, experiments may require that the scene contain products that may not yet have come to market or that have not yet even been developed. Through a multitude of ways the designer can introduce these into the scene and allow the researcher the freedom to pursue this task. Powerful 3D software packages, such as Autodesk 3D Studio MAX, allow 3D models to be constructed and rendered in a photorealistic manner. Such is their accuracy that architects use a combination of photographs and 3D rendering to sell or advertise proposed buildings to people who cannot grasp how the building will actually look in the environment by merely seeing plans or elevations. One powerful aspect of the 3D software is to accurately recreate the camera’s settings and lens used for the
photograph and weather data, assuming that the researcher wishes to view the impact of two different items in a specific scene. For instance, to capture Birrarung Marr (a public park that is located in Melbourne, Australia), the designer will either commission a photographer (or in some cases will act as the photographer) and will either specify the photograph in detail (focal length, ISO speed, elevation) or will use the photograph's EXIF data (a metadata file, containing the settings of the camera which is usually embedded in the digital photo's file) to recreate the camera’s settings in the 3D package. The time of the photograph is also found in the EXIF data and can be then used by the 3D package to determine the sun's orbital position, allowing the same illumination of the scene to occur. The two separate items are generated, placed in the same position and “photographed” in the 3D package. Using software such as Adobe Photoshop, these items are then digitally composited and the resultant image is a “perfect” mock-up, without the expense of producing a prototype and maintaining the integrity of the research. These skills are taught to designers early in their tertiary education as a matter of great importance; Kuys et al. suggest that high quality images:

“…basically have to “sell” the project and attract the viewer to read more into the design” (Kuys et al., 2010)

Digital composition and digital retouching methods have been used in the research carried out by the author to remove as many of the variables that may affect the results of the research. A range of stock photography was sourced from iStockPhoto and then digitally altered in Photoshop. Details that were modified included changing the facial expression, performing a “digital facelift” to make the model appear in a certain age bracket, removal of items such as jewellery to ensure the viewer did not perceive a certain level of wealth, ensuring that the model height was even for both male and female models, and finally to ensure that the item surveyed (the cutlery) was consistently placed in all the images. These modifications would prove to be difficult or impractical through other means and the professional training that has been undertaken by the designer allowed an effortless adjustment.
The resultant images are presented in Appendix 2 in chronological order, each depicting a modification.

The images in this montage demonstrate the aforementioned design work in chronological order. The cutlery used in the images raised issues. For example the first set of “elegant” cutlery presented was considered to be “too plain” by the research group, which was verified through the first pilot test. The respondents suggested that the cutlery was inexpensive, whereas the pieces themselves were from a renowned English cutler. This is reflected in the chronological diagram.

Creating the male version of the stimuli was significantly easier through the use of digital software as the intensive work to the background and the proportions and compositions were already made in developing the female image. The male image was placed in the same position with minor facial alterations required, producing a neutral outcome.
3.5 Initial Deployment

The pilot surveys were initially deployed to a convenience sample of fifty-seven first-year design students at Swinburne University of Technology. The students were informed of the survey and its aims and were supplied with a letter of informed consent and had the ability to opt out. A full ethics clearance (SUHREC Project 2010/68) was granted from Swinburne’s ethics committee and this was explained to the students in detail.

An initial paper-based pilot survey was undertaken with a convenience sample of eighteen first-year design students to determine if the factors within the survey were operational. As the survey’s respondent number was small, the results are not to be taken as statistically significant, however they do provide an insight in terms of stimuli generation and refinement that was subsequently carried out. The first pilot survey returned a response that was unusual. Due to the fact that a small convenience sample was used, there may have been a form of “designer contamination” effect in play. The convenience group had scored the “disabled” cutlery significantly higher in certain factors, with the “elegant” receiving the lowest scoring. The hypothesis is that the convenience sample, being predominantly young (late teen to early twenties) had selected the novel, “arthritic” and “designer” cutlery as opposed to the very traditional “elegant” cutlery. It is possible that this is due to a rejection of tradition and the outward appearance of an easily selectable and identifiable typology; Han (2010) suggests:

“In contrast, non-patricians (parvenus, poseurs, and proletarians) cannot recognize the subtle cues and require loud signals to recognize a brand and the connotations of status.” (Han et al., 2010).

This form of visual distinction may have come into play due to the youthful sample of participants, who have not been exposed to or are not interested in distinctions of various forms of cutlery. A much larger sample group was required with a greater
variance of age. A selective literature review was undertaken to understand the perception of design in three age groups – “Baby Boomers” (1946-1964), “Generation X” (1965-1982) and “Generation Y” (1983-1995).

3.5.1 Baby Boomers, Gen X and Gen Y's perception of Design

Roberts and Manolis (2000) suggest that while Gen X and Y were the first generations to grow up with intense marketing saturation, the Baby Boomers were born into an era of “unprecedented growth and surplus.” The Baby Boomer generation was portrayed as having strong convictions and taught to be independent. While these traits have generally led to a fulfilled life, with the Baby Boomers predominantly forming the “yuppies” of the 1980’s, these traits underlie some of the psychological issues that arthritis gives to when seen in the light of the research in chapter two. The relevance this has to their perception of design is that they have experienced the “good life”. The brand loyalty they have built up and the way that they were exposed to the brands (via print, television and “tradition”)4, especially in the higher end price scale of products, brings us back to Han et al. – that they are the ‘cognoscenti’ and recognise the subtle cues that a high status product promotes.

Conversely, Gen X and Y were the first generations to be truly immersed in media – twenty-four hour cable networks, VCRs and DVDS, the Internet and social media have exposed these generations from birth to much more advertising than the boomers (Roberts, J. A. and Manolis, C. 2000). Potentially as a result of this, they mistrust the media, have shorter attention spans and are susceptible to boredom (Quintal et al., 2009). Quintal et al. further delves into Gen Y’s preferences to brands and how they select products. The research suggests that they are the early

4 “Tradition” in this context is defined as a product that is traditionally aspirational and is found in the upper classes – i.e. a Rolex watch, Dom Perignon champagne, tailored clothing, etc.
adopters, and values such as environmental consciousness and a strong brand identification are at the forefront of their purchasing intent. Noble et al. (2009) suggests that brand loyalty in Gen Y is formed early on and they will remain loyal to brands that display values, such as style, value for money and longevity – in addition to this, the brand must have established or “proved” itself. This poses an interesting point in relation to the research in that if Gen Y hasn’t heard of, or had experience with an unfamiliar brand, much like the pilot survey suggested, they will not trust or bestow the “appropriate” value judgement. One response from Noble’s study, however, indicated that:

“I would rather invest in a piece that I am going to have for awhile than pay half the cost for something that I am only going to have for a few months. To me it is almost like an investment. And one day I can pass it on to my daughter, my granddaughter and whatnot…” (Noble et al., 2009)

This willingness to procure a high-quality product for heirloom value plays an integral role in this study and, as discussed, the appearance of ergonomic aids is a hindrance for their uptake. Generations X and Y especially will be seeking far more suitable products that allow them to maintain self expression and that can be passed on to the next generation yet affords this group comfort and ease of use. By surveying a large audience of the aforementioned three generations a measurable result answering the above hypothesis can be attained.
3.6 Online Deployment

To achieve the aim of a large and broad sample the survey was deployed on the Internet via a Swinburne website. This not only allowed the respondents to answer the survey in the comfort of their homes but also allowed a much greater variance in the age of the respondents and also the ability to track cultural differences between countries. This particular element would form a more global view on the issue and allow the tailoring of further research and design of a solution to individual countries. This was enabled internally through the creation of a bespoke survey module; the survey would “pop-up” when an external visitor to the Swinburne University of Technology’s video tutorial page clicked on a design tutorial. While this module was created to be part of the existing SUT’s webpage, this method of data gathering could be easily replicated utilising ‘off-the-shelf’ technology; websites such as SurveyMonkey are popular and low-cost. The pop-up could be easily “opted-out” and full disclosure of the project and ethics were displayed.

Previous PhD candidates at SUT have used this method of data gathering successfully; responses within these studies were in the range of one thousand respondents, affording the researchers a significant level of statistical certainty when analysing their data. The data is exported as a standard Microsoft Excel file and can be analysed using a variety of different statistical analysis software; within this survey, IBM’s SPSS was used. The research undertaken herein doubled previous attempts, with 2902 initial responses recorded.

One issue that arose with previous data gathering attempts was the issue of nationality. As some countries use the Imperial system of measurement (i.e. pounds, inches, feet, etc.) there were anomalies in the data gathering – correlations of height and weight were skewed in some regions as they did not successfully convert the measurements from Metric. It was decided that the units of measurement would be presented in both Metric and Imperial units to increase the accuracy of the survey data. This modification was undertaken before the survey went live.
3.7 Conclusion

Within this chapter, we have firstly established the room effect method as an appropriate tool for investigating stigma based upon appearance. Many previous studies demonstrate the value of this method and its validity; however, the problem with this method – as illustrated within this chapter – is the potential for inconsistencies with the stimuli generation. Studies were analysed and contrasted and simple compositional errors were found which might have impacted on the results. The research highlights where designers can undertake significant quantitative research to inform a designed outcome. The significant contribution to this body of work is the effect that a designer has on the stimuli generation, ensuring a level of quality and conformity that can only be achieved through digital manipulation. Several developments were made to the stimuli, such as manipulating facial expression and adjusting the background that would have been difficult or near impossible to achieve through other means. This was contrasted with two other studies using a similar method and their weaknesses were explored.

Design as a research field, and as a profession, is relatively young. However, the contribution that design can make to the research community is by facilitating and enabling aspects of data collection that would have been prohibitively expensive or impossible to achieve in other forms. As discussed above, the accuracy that can be achieved using digital products and a trained operator can be extremely high; this will lead to an increase in quality output through a robust stimuli set. Other avenues of research could also be explored with the assistance of a designer. Such avenues may include augmented reality (where an overlay is placed over live video) or immersive 3D spaces, much like the fabled Star Trek “Holodeck” may be available in the near future. These, high-resolution and high-tech stimuli may allow the researcher to perform different analyses as opposed to the standard Likert-scale survey.
Chapter Four: Results Of The Data Gathering

4.1 Introduction
The development of stimuli for a survey was discussed in the previous chapter. Through a design-led approach, a composition of various elements, such as models, props and backdrops were created and digitally altered to allow the respondent to view the image in a specific context and to ensure the accuracy and integrity of the survey. This chapter deals with the deployment of the paper-based pilot survey and the problems that surround using a convenience sample. An online survey was then deployed, with respondents from sixty-seven countries taking part. This chapter aims to inform the reader of the process involved in collecting the data, cleaning and ensuring its integrity and the analyses undertaken to achieve the result.

4.2 Background to the surveys
The survey’s essence was derived from Canter’s (1977) “room interference protocol”, where a composite image of a person was placed within three different rooms and the respondents were to make value judgments on the three images, based on a survey that referenced the “big five” personality traits: openness, conscientiousness, extroversion, agreeableness, neuroticism (John, O. S. and Srivastava, P. 1999). These traits are further broken down into subgroups in the table below:

<table>
<thead>
<tr>
<th>Agreeableness</th>
<th>Extroversion</th>
<th>Conscientiousness</th>
<th>Neuroticism</th>
<th>Openness to Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friendly</td>
<td>Masculine/Feminine</td>
<td>Positive attitude</td>
<td>Instability</td>
<td>Creativity</td>
</tr>
<tr>
<td>Trustworthiness</td>
<td>Elegance</td>
<td>Reliability</td>
<td>Anxiousness</td>
<td>Stylishness</td>
</tr>
<tr>
<td>Generosity</td>
<td>Sportiness</td>
<td>Efficiency</td>
<td>Vulnerable</td>
<td>Open to new ideas</td>
</tr>
<tr>
<td>Kindness</td>
<td>Attractiveness</td>
<td>Organized</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The survey began with basic identification questions:

1. Your age
2. Your gender
3. Your country of origin

These questions allowed the researcher to test for possible differences, dependant on the respondent.

The following questions dealt with the physical attributes of the model in the image:

4. How tall do you think she is?
5. How heavy do you think she is?
6. How old do you think she is?
7. What level of education did she achieve?
8. What do you think her annual income would be?
9. What would her IQ be? (100 is average)
10. What type of job would she have?

The survey then progressed to the questions based on the aforementioned “Big Five” personality traits. The questions are listed below:

11. He/She looks like he/she has a positive attitude to life.
12. He/She is creative.
13. She looks friendly.
14. She looks unstable.
15. She looks trustworthy.
16. She looks anxious.
17. She is elegant.
18. She looks sporty.
19. She looks stylish.
20. She looks open to new ideas.
21. She is attractive.
22. She appears generous.
23. She looks reliable.
24. She looks efficient.
25. She looks organised.
26. She appears kind.
27. She looks vulnerable.

A final question was used to measure the apparent cost of the cutlery, which was used to gauge the respondent’s view on the pieces:

28. The cutlery is expensive.

As described in the previous chapter, surveys of this type have been trialled successfully prior to this exercise, giving the research method a solid platform of credibility. The online survey itself was of a similar design of Effendi Et. Al. (2009) where a bespoke survey module was created, allowing one of the six images to be on-screen at all times; providing a reference to the questions asked.

One area where this module was adjusted was with the gathering of location data and in the units in which some questions were asked. In regards to the first point, one area of potential further research highlighted was the collective regional “thought” on the effect of the products. While this trend itself may be broad stereotyping, it may assist in developing assistive products in localized markets. As the ethics approval protocol allowed us to track Internet Protocol (IP) addresses, further researchers may be able to localize specific traits down to the city or town level – it would not be beyond the scope of thought that products may be created in the future for such specific, localized markets and therefore would require very specific location information in which to inform the design and shape of the product.

The second problem was in regards to the units of measurement. As the survey was being deployed via the Swinburne University of Technology’s website, it had the capability of being accessed by anyone in the world who has an Internet connection.

Previously, the surveys undertaken in this manner only used the metric system of measurement, which does not account for international respondents who use the
imperial system, such as respondents from the United States of America or the United Kingdom. Globally, the common convention is to use the International Standard of Units (SI) (also known as the metric system), as a scientific standard (Government, 2012). However, the assumption is made that the respondents are not formally trained in scientific methods and are from a variety of backgrounds. The respondents in the previous surveys may have become frustrated or have estimated the equivalent measurement in imperial units, leading to data that may have been compromised. To ensure the integrity of the data gathering presented in this research, the units of measurement were therefore presented in metric and imperial.

The conversion was performed using the internet-based calculator WolframAlpha (http://www.wolframalpha.com) and the resultant conversions are presented below:

<table>
<thead>
<tr>
<th>4. How tall do you think he/she is?</th>
</tr>
</thead>
<tbody>
<tr>
<td>140cm</td>
</tr>
<tr>
<td>145cm</td>
</tr>
<tr>
<td>150cm</td>
</tr>
<tr>
<td>155cm</td>
</tr>
<tr>
<td>160cm</td>
</tr>
<tr>
<td>165cm</td>
</tr>
<tr>
<td>170cm</td>
</tr>
<tr>
<td>175cm</td>
</tr>
<tr>
<td>180cm</td>
</tr>
<tr>
<td>185cm</td>
</tr>
<tr>
<td>190cm</td>
</tr>
</tbody>
</table>
5. How heavy do you think he/she is?

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Weight (lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>40kg</td>
<td>88 lb</td>
</tr>
<tr>
<td>45kg</td>
<td>99 lb</td>
</tr>
<tr>
<td>50kg</td>
<td>110 lb</td>
</tr>
<tr>
<td>55kg</td>
<td>121 lb</td>
</tr>
<tr>
<td>60kg</td>
<td>132 lb</td>
</tr>
<tr>
<td>65kg</td>
<td>143 lb</td>
</tr>
<tr>
<td>70kg</td>
<td>154 lb</td>
</tr>
<tr>
<td>75kg</td>
<td>165 lb</td>
</tr>
<tr>
<td>80kg</td>
<td>176 lb</td>
</tr>
<tr>
<td>85kg</td>
<td>187 lb</td>
</tr>
<tr>
<td>90kg</td>
<td>198 lb</td>
</tr>
<tr>
<td>95kg</td>
<td>209 lb</td>
</tr>
<tr>
<td>100kg</td>
<td>220 lb</td>
</tr>
</tbody>
</table>

4.3 Pilot Survey

An initial pilot survey was conducted with a convenience group of first-year undergraduate design students at Swinburne University. A letter of informed consent, in accordance with the ethics protocol, was included and explained. The students’ participation was voluntary and they were under no duress or expectation to undertake the survey. Three paper-based pilot surveys were deployed prior to commencing the online survey to provide validity for the model. The surveys undertaken used the female model; this was used as the literature suggested that, statistically, females had a greater tendency to develop arthritis and display more daily pain (Affleck et al., 1999), and therefore would be most likely to use adaptive cutlery. The three written surveys were identical, however the stimulus contained differing cutlery – arthritic (grey foam handles), disabled (large white foam handles with straps) and elegant (silver, minimalist handles).
The surveys were undertaken using a convenience sample of first-year undergraduate communication design students from Swinburne University of Technology. The first survey had a respondent number of eighteen (n=18) and was undertaken on the 6th of July 2010. An initial analysis was performed on the sample. However, this proved inconclusive and due to the small sample size, statistically unreliable; there appeared to be a preference for the “arthritic” cutlery. As discussed earlier within the study, the students may have not responded to the plain “elegant” cutlery. To further establish an effect in light of the referred literature, a modification was performed on the “elegant” cutlery — the David Mellor cutlery was replaced by a very traditional Sheffield-style piece; the rationale for this being that the Sheffield cutlery is far more identifiable as an object of status than a minimalistic piece to the sample audience, which may not fully understand the prominence of the Mellor brand (Han et al., 2010). A statement was added to the survey - “The cutlery looks expensive”, for which the cohort was to agree or disagree according to the nine-point scale.

As the respondent numbers were low, a second survey was undertaken on the 30th of August 2010 with a convenience sample of thirty-nine (n=39) first-year undergraduate industrial design and product design engineering students. Again, the resultant data was inconclusive due to the sample size; however, the same “designer effect” reaction was noted.

The survey distribution was as follows:

<table>
<thead>
<tr>
<th>Survey Name</th>
<th>Respondents (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Arthritis</td>
<td>13</td>
</tr>
<tr>
<td>Female Disabled</td>
<td>12</td>
</tr>
<tr>
<td>Female Elegant</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
</tr>
</tbody>
</table>

The data was collated and imported into IBM SPSS Statistics v19 for modelling. As this was a pilot survey a simple means test was applied to evaluate the data. Due to
the small sample size, Factor Analysis was not undertaken. The results of the means test are tabled on the following pages:

### Report

<table>
<thead>
<tr>
<th>Survey Code</th>
<th>He/She looks like he/she has a positive attitude to life.</th>
<th>He/She is creative.</th>
<th>He/She looks friendly.</th>
<th>He/She looks unstable.</th>
<th>He/She looks masculine.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean</strong></td>
<td>7.08</td>
<td>5.38</td>
<td>6.85</td>
<td>3.92</td>
<td>3.31</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td><strong>Std. Deviation</strong></td>
<td>0.760</td>
<td>1.325</td>
<td>1.214</td>
<td>1.656</td>
<td>2.016</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>7.50</td>
<td>5.83</td>
<td>7.00</td>
<td>3.00</td>
<td>3.33</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td><strong>Std. Deviation</strong></td>
<td>1.087</td>
<td>1.467</td>
<td>1.206</td>
<td>1.954</td>
<td>2.015</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>7.64</td>
<td>5.21</td>
<td>7.79</td>
<td>3.29</td>
<td>3.36</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td><strong>Std. Deviation</strong></td>
<td>0.929</td>
<td>1.477</td>
<td>1.311</td>
<td>2.054</td>
<td>1.447</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>7.41</td>
<td>5.46</td>
<td>7.23</td>
<td>3.41</td>
<td>3.33</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>39</td>
<td>39</td>
<td>39</td>
<td>39</td>
<td>39</td>
</tr>
<tr>
<td><strong>Std. Deviation</strong></td>
<td>0.938</td>
<td>1.411</td>
<td>1.287</td>
<td>1.888</td>
<td>1.782</td>
</tr>
</tbody>
</table>
### Report

<table>
<thead>
<tr>
<th>Survey Code</th>
<th>He/She looks trustworthy.</th>
<th>He/She looks anxious.</th>
<th>He/She is elegant.</th>
<th>He/She looks sporty.</th>
<th>He/She looks stylish.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Arthritis N</td>
<td>6.69</td>
<td>4.92</td>
<td>6.77</td>
<td>2.77</td>
<td>4.77</td>
</tr>
<tr>
<td>Female</td>
<td>Mean</td>
<td>6.69</td>
<td>4.92</td>
<td>6.77</td>
<td>2.77</td>
</tr>
<tr>
<td>Female</td>
<td>Std. Deviation</td>
<td>1.316</td>
<td>1.929</td>
<td>1.013</td>
<td>1.833</td>
</tr>
<tr>
<td>Female</td>
<td>Mean</td>
<td>7.00</td>
<td>4.42</td>
<td>6.25</td>
<td>2.67</td>
</tr>
<tr>
<td>Female</td>
<td>Std. Deviation</td>
<td>1.348</td>
<td>2.575</td>
<td>1.658</td>
<td>2.015</td>
</tr>
<tr>
<td>Female</td>
<td>Mean</td>
<td>7.29</td>
<td>5.57</td>
<td>6.14</td>
<td>2.43</td>
</tr>
<tr>
<td>Female</td>
<td>Std. Deviation</td>
<td>1.437</td>
<td>2.409</td>
<td>1.460</td>
<td>1.505</td>
</tr>
<tr>
<td>Female</td>
<td>Mean</td>
<td>7.00</td>
<td>5.00</td>
<td>6.38</td>
<td>2.62</td>
</tr>
<tr>
<td>Total N</td>
<td>39</td>
<td>38</td>
<td>39</td>
<td>39</td>
<td>39</td>
</tr>
<tr>
<td>Total N</td>
<td>Mean</td>
<td>7.00</td>
<td>5.00</td>
<td>6.38</td>
<td>2.62</td>
</tr>
<tr>
<td>Total N</td>
<td>Std. Deviation</td>
<td>1.357</td>
<td>2.313</td>
<td>1.388</td>
<td>1.741</td>
</tr>
<tr>
<td>Survey Code</td>
<td>He/She looks open to new ideas.</td>
<td>He/She is attractive.</td>
<td>He/She appears generous.</td>
<td>He/She looks reliable.</td>
<td>He/She looks efficient.</td>
</tr>
<tr>
<td>-------------</td>
<td>---------------------------------</td>
<td>-----------------------</td>
<td>--------------------------</td>
<td>------------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>Female</td>
<td>Mean</td>
<td>5.08</td>
<td>3.69</td>
<td>6.08</td>
<td>6.77</td>
</tr>
<tr>
<td>Arthritis</td>
<td>N</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation</td>
<td>1.935</td>
<td>2.016</td>
<td>1.706</td>
<td>1.481</td>
</tr>
<tr>
<td>Female</td>
<td>Mean</td>
<td>5.00</td>
<td>2.92</td>
<td>5.50</td>
<td>6.25</td>
</tr>
<tr>
<td>Disabled</td>
<td>N</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation</td>
<td>1.859</td>
<td>1.929</td>
<td>1.834</td>
<td>1.603</td>
</tr>
<tr>
<td>Female</td>
<td>Mean</td>
<td>5.57</td>
<td>3.57</td>
<td>6.36</td>
<td>6.85</td>
</tr>
<tr>
<td>Elegant</td>
<td>N</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation</td>
<td>2.102</td>
<td>2.344</td>
<td>2.098</td>
<td>1.772</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td>5.23</td>
<td>3.41</td>
<td>6.00</td>
<td>6.63</td>
</tr>
<tr>
<td>Total</td>
<td>N</td>
<td>39</td>
<td>39</td>
<td>39</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation</td>
<td>1.939</td>
<td>2.087</td>
<td>1.878</td>
<td>1.601</td>
</tr>
</tbody>
</table>
## Report

<table>
<thead>
<tr>
<th>Survey Code</th>
<th>He/She looks organised.</th>
<th>He/She appears kind.</th>
<th>He/She looks vulnerable.</th>
<th>The cutlery is expensive.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Arthritic</td>
<td>Mean</td>
<td>6.62</td>
<td>6.83</td>
<td>5.54</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>13</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation</td>
<td>2.142</td>
<td>1.467</td>
<td>1.761</td>
</tr>
<tr>
<td>Female Disabled</td>
<td>Mean</td>
<td>7.08</td>
<td>6.17</td>
<td>5.33</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation</td>
<td>1.564</td>
<td>1.586</td>
<td>2.741</td>
</tr>
<tr>
<td>Female Elegant</td>
<td>Mean</td>
<td>7.50</td>
<td>7.43</td>
<td>4.79</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>14</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation</td>
<td>1.019</td>
<td>1.785</td>
<td>2.190</td>
</tr>
<tr>
<td>Total</td>
<td>Mean</td>
<td>7.08</td>
<td>6.84</td>
<td>5.21</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>39</td>
<td>38</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation</td>
<td>1.628</td>
<td>1.669</td>
<td>2.215</td>
</tr>
</tbody>
</table>

From these means we can chart each characteristic within the pilot survey to give a visual overview of the responses.
The first response measured the positive attitude of the model; the vertical axis measures the number of responses, with the horizontal axis measuring the response, based upon the Likert Scale.

1. **He/She looks like he/she has a positive attitude to life.**

![Graph](image)

The means for this question all fall within a moderately positive range: however, it is interesting to note that the “arthritic” and “elegant” images had the greatest number of responses within this range.

2. **He/She is creative.**

![Graph](image)

The “elegant” and “disabled” cutlery had the highest counts; this indicates the respondents suggested that she is moderately creative, whereas the arthritic cutlery was seen to bestow a negative trait.
3. He/She looks friendly.

All of the tested images were ranked generally positive. The model with the “elegant” cutlery scored generally higher than the other pieces in terms of the friendliness trait, however the model with the “disabled” cutlery was also ranked moderately positive.

4. She looks unstable.

This graph illustrates an interesting aspect of the pilot survey. The model with the “elegant” cutlery is perceived to be both unstable and stable, whereas the model with the “arthritic” cutlery is verging towards instability and the “disabled” model is spread fairly evenly between stable and unstable. The respondents seem to be evenly split across both of these categories.
5. He/She looks masculine.

Within this question in the pilot survey the “arthritic” and “disabled” cutlery is perceived to infer both femininity and gender neutrality. The “elegant” cutlery appears more feminine.

6. He/She looks trustworthy.

This question also provides an interesting result. Generally the trend is towards trustworthiness, however the “elegant” cutlery scores highest. The “disabled” cutlery is also verging towards trustworthiness and the “arthritic” cutlery demonstrates a plateau; showing that the respondents did not seem to feel that it inferred a negative trait as the trend is generally positive. However, the cutlery was not overly effective with inferring a definitive level of trust.
7. He/She looks anxious.

The “elegant” cutlery, somewhat unexpectedly, appears to have inferred anxiousness with the model. The “arthritic” cutlery is inferring a moderate level of anxiety, whereas the “disabled” cutlery infers a low level. This result is atypical of what was expected and what the literature suggested.

8. He/She is elegant.

The “arthritic” cutlery displays a very interesting upward trend beginning from the mid-point (nor agree or disagree) and appearing to infer a slight degree of elegance towards the user. This is contrary to the literature’s suggestion. What is also interesting is the spread of responses regarding the “disabled” cutlery — while it peaks around the mid-point of the range, indicating that the user is not perceived to
be overly elegant, there were a few responses indicating that it did infer elegance. Of course, the “elegant” cutlery performed as expected – generally inferring elegance to the user.

9. He/She looks sporty.

![Graph showing responses for sporty appearance]

None of the cutlery inferred a level of sportiness; the “elegant” cutlery performs best. One interesting observation is that the “disabled” cutlery performed better than the “arthritic” model in inferring sportiness; a very unusual response.

10. He/She looks stylish.

![Graph showing responses for stylish appearance]

This question provided the most interesting result of the survey. We see that the “arthritic” and “elegant” cutlery provide a slightly positive result, with the “elegant” cutlery inferring the greatest degree of stylishness. The “disabled” cutlery also
performed better than expected, however, within the literature review it was suggested that the aesthetics of ergonomic devices were a hindrance to use, due to the fact that people did not believe that they were attractive and therefore did not want to be associated with them. With the “arthritic” cutlery being perceived as reasonably stylish (and within the spread of the “elegant” cutlery) we can begin to see a pattern emerge.

11. He/She looks open to new ideas.

The response for this question assists in the validation of the aforementioned “designer effect” by demonstrating a high response count for the model with the “arthritic” cutlery. While the model with the “disabled” and “elegant” cutlery record the highest response, the “arthritic” cutlery receives the highest count, perhaps due to the novel appearance of the utensil.
12. **He/She is attractive.**

![Graph showing attractiveness perceptions](image)

The model was not perceived to be overly attractive with any of the cutlery used. This may be due to the young age (21.333 years old) of the sample group. However, the “elegant” cutlery performs best.

13. **He/She appears generous.**

![Graph showing generosity perceptions](image)

In regards to generosity, the “elegant” cutlery appears to infer this best, however the “disabled” and “elegant” cutlery do not seem to infer much in this regard; that is, the average response indicated that the model did not appear to be overly generous.
14. He/She looks reliable.

Generally the model is perceived to be more reliable when utilising the “elegant” cutlery. However the “arthritic” cutlery is split predominantly between unreliable and reliable.

15. He/She looks organised.

Generally the respondents perceived the model to be organised, however the model utilising the “arthritic” cutlery suggested strongly to the respondents that the user is more organised than the “elegant” or “disabled” cutlery.
16. He/She appears kind.

The model with the “elegant” cutlery appears to be kinder than the other users with the respondents indicating that she is moderate to very kind. The “disabled” and “arthritic” cutlery, in contrast, appears to have little effect, as the respondents believe that she is neither kind nor malicious.

17. He/She looks vulnerable.

The result of this question is interesting on a number of levels. Firstly, the arthritic cutlery records a response of neither vulnerable nor guarded, however the responses fall between a narrow window. The other pieces of cutlery are spread across the scale, with the “disabled” cutlery predictably being split between neither and very vulnerable. This response is both typical and atypical of the literature. It is
typical because the “disabled” cutlery is perceived to confer a sense of vulnerability toward the user. But it is also atypical because the “arthritic” cutlery, which is also utilised as a medical ergonomic aid, appears to have very little effect on the perception of the user.

18. The cutlery is expensive.

This final question was designed as a way of checking the validity of the responses and understanding how the respondents perceived the cutlery. What is most surprising is that the “arthritic” cutlery is perceived to be the most expensive. While the items are actually quite costly, the appearance of them belies this – they are manufactured of foam and steel, versus silver for the “elegant” cutlery. The “elegant” cutlery also was split between neither cheap nor expensive, or quite expensive. The “disabled” cutlery also displayed an upward trend, where the respondents viewed it as reasonably expensive.
The result of the pilot survey was unexpected. It appeared to contradict the available literature on the emotional consequences of arthritis (social exclusion, sensitivity about appearance, etc). The “arthritic” cutlery, which would be more commonly used than the disabled cutlery, demonstrates an interesting trend. The respondents viewed the model as being more organised, moderately positive, elegant and stylish. The respondents also indicated that the “arthritic” cutlery was more expensive than the silver “elegant” cutlery and that the “elegant” cutlery inferred a greater sense of vulnerability within the model. This result is puzzling, but there are potential factors that need to be accounted for. Firstly, the sample size was small; thirty-nine respondents divided into three groups, resulting in less than fifteen respondents for each image. Secondly, the respondent’s mean age was twenty-one years old; this shows us only one small section of a young demographic. There may also be a “designer effect” – perhaps the “elegant” cutlery was too conservative in contrast to the other images; the ribbed, foam-handled cutlery appeared far more novel in comparison. This hypothesis can also be supported through marketing literature, specifically Han et al., 2010. In this study heavily branded goods of the same brand were seen to be more expensive than the more elegant, unobtrusive versions of the same mark. Perhaps if the “elegant” cutlery was branded, or if the respondent knew of the brand in the first place, the perception of the piece of cutlery may have been different.

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5 The term “designer effect” has been created to illustrate the hypothesis that the “disabled” cutlery appears to be more novel and interesting to the young respondents. This hypothesis is supported by Han et al., 2012’s study on the perception of products and branding by younger people.
4.4 Online Survey

An online survey was created in the aforementioned bespoke module and launched on 2 May 2011. The survey was designed to display one of the six images at random, to ensure no “double ups” from respondents. Data cleaning was also undertaken to ensure integrity of the study, and is detailed below.

Six surveys were used; three for each model. The respondents per survey are listed below:

<table>
<thead>
<tr>
<th>Survey Name</th>
<th>Initial Respondents (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Arthritis</td>
<td>513</td>
</tr>
<tr>
<td>Female Disabled</td>
<td>495</td>
</tr>
<tr>
<td>Female Elegant</td>
<td>487</td>
</tr>
<tr>
<td>Male Arthritis</td>
<td>444</td>
</tr>
<tr>
<td>Male Disabled</td>
<td>476</td>
</tr>
<tr>
<td>Male Elegant</td>
<td>487</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2902</strong></td>
</tr>
</tbody>
</table>

The survey data was subsequently downloaded on 8 August 2011, after a total of 2902 responses, and data cleaning commenced immediately. As the survey was optional a significant number of respondents had either opted out, intentionally left the answers blank or had only partially completed the survey. These respondents were subsequently removed from the dataset. If the respondent had given their age, this was also used alongside the IP address to ensure that no one under the age of 18 was used, and also to improve the integrity of the survey by helping to ensure that the respondents were unique; however, it is important to note that the survey did not take any specific identifying information of the respondent outside of these parameters.

Respondents who had also placed alphabetical “gibberish” answers, such as “jahsdjkhasd”, were also removed.
<table>
<thead>
<tr>
<th>Survey Name</th>
<th>Cleaned Respondents (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Arthritis</td>
<td>90</td>
</tr>
<tr>
<td>Female Disabled</td>
<td>104</td>
</tr>
<tr>
<td>Female Elegant</td>
<td>104</td>
</tr>
<tr>
<td>Male Arthritis</td>
<td>81</td>
</tr>
<tr>
<td>Male Disabled</td>
<td>93</td>
</tr>
<tr>
<td>Male Elegant</td>
<td>90</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>562</strong></td>
</tr>
</tbody>
</table>

The data was then collated into one file, with each survey identified by a numerical code. The internet protocol (IP) addresses of each respondent were also collected, which allows the researcher to understand regional trends. Using an online tool these numbers could be matched to countries. The IP addresses were also assigned numerical codes to allow the software to interpret the data. The chart below indicates the responses from the countries.
The responses from Australia, India, the United States of America and the United Kingdom formed the vast majority of the survey, however a wide variety of countries were represented, including the United Arab Emirates, Bulgaria, Trinidad and Tobago.

Portions of the data underwent dimension reduction to determine if any common factors were involved. Portions of the survey were separated into groups and dimension reduction was undertaken on these. The groups were:

a) Performance: IQ, Job, Income, Education
b) Physical Attributes: Weight, Height
c) Characteristics: The eighteen questions based on the “Big Five” character traits.

The dimension reduction was performed in IBM SPSS Statistics v19. The extraction used was Principal Axis Factoring, with Direct Oblimin Rotation.

The Characteristics group was analysed with the above settings. Three factors were extracted, as shown in the pattern matrix, which accounted for 56.9% of the variance, as demonstrated on the following page:
### Pattern Matrix

<table>
<thead>
<tr>
<th>Description</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>He/She appears kind.</td>
<td>0.898</td>
<td></td>
<td>0.108</td>
</tr>
<tr>
<td>He/She looks reliable.</td>
<td>0.840</td>
<td></td>
<td></td>
</tr>
<tr>
<td>He/She looks efficient.</td>
<td>0.811</td>
<td></td>
<td></td>
</tr>
<tr>
<td>He/She looks organised.</td>
<td>0.775</td>
<td></td>
<td></td>
</tr>
<tr>
<td>He/She looks like he/she has a positive attitude to life.</td>
<td>0.762</td>
<td></td>
<td></td>
</tr>
<tr>
<td>He/She looks friendly.</td>
<td>0.758</td>
<td></td>
<td></td>
</tr>
<tr>
<td>He/She looks trustworthy.</td>
<td>0.683</td>
<td></td>
<td></td>
</tr>
<tr>
<td>He/She appears generous.</td>
<td>0.619</td>
<td>0.147</td>
<td>-0.166</td>
</tr>
<tr>
<td>He/She is creative.</td>
<td>0.455</td>
<td>0.147</td>
<td>-0.265</td>
</tr>
<tr>
<td>He/She looks unstable.</td>
<td></td>
<td>0.686</td>
<td>0.108</td>
</tr>
<tr>
<td>He/She looks anxious.</td>
<td></td>
<td>0.668</td>
<td>-0.144</td>
</tr>
<tr>
<td>He/She looks vulnerable.</td>
<td>0.177</td>
<td>0.354</td>
<td>-0.197</td>
</tr>
<tr>
<td>He/She looks stylish.</td>
<td></td>
<td></td>
<td>-0.791</td>
</tr>
<tr>
<td>He/She is attractive.</td>
<td></td>
<td></td>
<td>-0.749</td>
</tr>
<tr>
<td>He/She looks sporty.</td>
<td></td>
<td></td>
<td>-0.725</td>
</tr>
<tr>
<td>He/She is elegant.</td>
<td>0.315</td>
<td></td>
<td>-0.510</td>
</tr>
</tbody>
</table>

Extraction Method: Principal Axis Factoring.
Factor 1 is a measure of positive personality traits; kindness, reliability, efficiency, organization, positivity, friendliness, trustworthiness, generosity and creativity. The majority of the loadings for this factor are high (> .600) and accounted for 44.9% of the total variance. Factor 2 is a measure of the negative personality traits; instability, anxiousness and vulnerability. This factor's loadings contain two above .600 and accounted for 8.9% of the total variance. Factor 3 is a measure of “style” and was henceforth named “sartorial”. This factor is significant to the study. The three loadings rated above .700 are all specific towards appearance; stylishness, attractiveness and sportiness. This factor accounted for 3% of the total variance. A reliability analysis on the above three factors was performed with an acceptable Cronbach’s Alpha score of .636.
4.5 Discussion of Factor Analysis

The above analysis in relation to the questionnaire was related to the aforementioned Five-Factor Model (FFM). Each extracted factor was named in accordance with the questions for which it rated; factor 1 being “positive”, factor 2 being “negative” and factor 3 being named “sartorial”.

In this study the “positive” factor was the strongest; aside from accounting for the largest amount (44.9%) of the variance the spread of questions it accounted for were narrow and overall positive. This suggests that the images and models selected for the survey promoted a generally positive experience for the respondent. In the context of the research this is important as we are looking for an effect that is bestowed by the cutlery and not the person. As discussed in the literature review the effect that arthritis has on the person may disfigure the hands and reduce mobility. However the attractiveness of the person should not suffer drastically from this affliction, especially in a static mode such as a photograph.

The “negative” factor’s questions were in regards to instability and anxiousness; the loadings for these were .686 and .668 respectively. These two loadings are small, however they are statistically significant; their presence may suggest that a small product-based effect may be in play, which is in line with the aforementioned literature regarding the emotional disconnect between the aesthetics of ergonomic devices and the user. The fact the respondents perceive the models as anxious and unstable, yet attractive and generally positive is of note.

The third “sartorial” factor is of most interest in this research. The loadings are significant, as discussed above, however it is the questions to which they are

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6 Sartorial is defined as “of or relating to a tailor or tailored clothes; broadly: of or relating to clothes” by the Merriam – Webster dictionary, however, for the purposes of this study, we have used this term to define the visual attributes of the respondent – style, attractiveness and sportiness.
associated with that generates discussion. As this factor measures stylistness, attractiveness and sportiness, it is interesting that there is a strong (>-.700) loading towards these questions, yet overall the perception of the model in the image remains constant. As discussed in the previous chapter, the only difference between the images is the cutlery itself, as the models and background remain identical.

4.6 Univariate Analysis of Variance (UNIANOVA)
A Univariate Analysis of Variance (UNIANOVA) was undertaken to further explore the relationships that the cutlery and the models presented. As this research is primarily concerned with the effect that the cutlery has on the person this is a pertinent exploration, as it would validate the hypothesis presented earlier in the research; that adaptive cutlery, through its aesthetics, discriminates against the user. As the literature (Affleck et al., 1999, Backman et al., 2008) suggests, the problem appears to be amplified with women, as they believe that the preparation of a meal is seen as a important feminine trait; as discussed in the literature review, Sidenvall et. al (2000), which describes the preparation of food for family members as “a gift”.

4.7 UNIANOVA of “Sartorial” Factor
The UNIANOVA was first run using the “sartorial” as the dependant variable and measured against the six images. The number of respondents in the UNIANOVA is detailed on the following page:
### Between-Subjects Factors

<table>
<thead>
<tr>
<th>Value</th>
<th>Label</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00</td>
<td>woman</td>
<td>104</td>
</tr>
<tr>
<td>2.00</td>
<td>man</td>
<td>119</td>
</tr>
<tr>
<td>1.00</td>
<td>arthritic</td>
<td>79</td>
</tr>
<tr>
<td>2.00</td>
<td>disabled</td>
<td>92</td>
</tr>
<tr>
<td>3.00</td>
<td>conventional</td>
<td>52</td>
</tr>
<tr>
<td>1</td>
<td>Male</td>
<td>181</td>
</tr>
<tr>
<td>2</td>
<td>Female</td>
<td>42</td>
</tr>
</tbody>
</table>

The cutlery's numerical code is defined as:

1: “Arthritic” Cutlery; these being the pieces that are grey, foam handled. These items are commonly available at assistive living centres.

2: “Disabled” Cutlery; these being the white foam and Velcro handles. These items are suitable for people with a significant disability, such as tremors and very low grip strength

3: “Elegant (Conventional)” Cutlery; these being a traditional silverware pattern, commonly associated with the cutlers from Sheffield, England.

The UNIANOVA was performed with the following results tabulated on the following page:
### Tests of Between-Subjects Effects

**Dependent Variable:** sartorial

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>68.364a</td>
<td>14</td>
<td>4.883</td>
<td>1.556</td>
<td>.094</td>
<td>.095</td>
</tr>
<tr>
<td>Intercept</td>
<td>333.935</td>
<td>1</td>
<td>333.935</td>
<td>106.419</td>
<td>.000</td>
<td>.338</td>
</tr>
<tr>
<td>SexPic</td>
<td>.030</td>
<td>1</td>
<td>.030</td>
<td>.009</td>
<td>.923</td>
<td>.000</td>
</tr>
<tr>
<td>Gender</td>
<td>.006</td>
<td>1</td>
<td>.006</td>
<td>.002</td>
<td>.966</td>
<td>.000</td>
</tr>
<tr>
<td>ResAge</td>
<td>3.814</td>
<td>1</td>
<td>3.814</td>
<td>1.215</td>
<td>.272</td>
<td>.006</td>
</tr>
<tr>
<td>Gender * ResAge</td>
<td>.326</td>
<td>1</td>
<td>.326</td>
<td>.104</td>
<td>.747</td>
<td>.000</td>
</tr>
<tr>
<td>GenderPic * Gender</td>
<td>.278</td>
<td>1</td>
<td>.278</td>
<td>.089</td>
<td>.766</td>
<td>.000</td>
</tr>
<tr>
<td>cutlery * Gender</td>
<td>2.650</td>
<td>2</td>
<td>1.325</td>
<td>.422</td>
<td>.656</td>
<td>.004</td>
</tr>
<tr>
<td>GenderPic * ResAge</td>
<td>.074</td>
<td>1</td>
<td>.074</td>
<td>.023</td>
<td>.878</td>
<td>.000</td>
</tr>
<tr>
<td>cutlery * ResAge</td>
<td>16.031</td>
<td>2</td>
<td>8.016</td>
<td>2.554</td>
<td>.080</td>
<td>.024</td>
</tr>
<tr>
<td>GenderPic * cutlery</td>
<td>19.291</td>
<td>2</td>
<td>9.645</td>
<td>3.074</td>
<td>.048</td>
<td>.029</td>
</tr>
<tr>
<td>Error</td>
<td>652.690</td>
<td>208</td>
<td>3.138</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>5594.625</td>
<td>223</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>721.054</td>
<td>222</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. R Squared = .095, (Adjusted R Squared = .034)
Within the analysis two significant effects were detected - the cutlery and the gender image and cutlery interaction. However we will only discuss the implications of the interaction.

A small, but significant effect [F (2,208) 3.074, p = 0.048)] was identified between the gender of the model and the cutlery type used. This was then explored further through an examination of the means. The results were tabled and presented below.

GenderPic * cutlery

Dependent Variable: sartorial

<table>
<thead>
<tr>
<th>GenderPic</th>
<th>cutlery</th>
<th>Mean</th>
<th>Std. Error</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lower Bound</td>
<td>Upper Bound</td>
<td></td>
</tr>
<tr>
<td>woman</td>
<td>arthritic</td>
<td>5.146a</td>
<td>.376</td>
<td>4.404</td>
</tr>
<tr>
<td></td>
<td>disabled</td>
<td>4.118a</td>
<td>.303</td>
<td>3.521</td>
</tr>
<tr>
<td></td>
<td>conventional</td>
<td>5.058a</td>
<td>.746</td>
<td>3.588</td>
</tr>
<tr>
<td>man</td>
<td>arthritic</td>
<td>5.141a</td>
<td>.419</td>
<td>4.314</td>
</tr>
<tr>
<td></td>
<td>disabled</td>
<td>5.240a</td>
<td>.311</td>
<td>4.627</td>
</tr>
<tr>
<td></td>
<td>conventional</td>
<td>4.502a</td>
<td>.314</td>
<td>3.884</td>
</tr>
</tbody>
</table>

When plotted, this data gives us a very interesting result – there is a measurable effect within the “woman” subgroup; the respondents are perceiving the woman to have less "style" than the male model in the image when using the "disabled" cutlery. In regards to the use of the arthritic and conventional cutlery there is only a small difference. Conversely, with the male group, we see a drop within the conventional/elegant group.
This result is quite interesting from a “designerly” point of view. As the typology of the “elegant/conventional” cutlery and the “arthritic” cutlery is similar, it would be expected that the “disabled” cutlery would perform poorly as the outward appearance is different and stigmatising. The effect it has on the female model is drastic in comparison to the male model, where they are perceived to be more stylish using this form of cutlery. However, when contrasted with the “elegant/conventional” cutlery the male is perceived as measurably less attractive.

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7 “The word “designerly” is defined by Cross, N. (2007) as a way of communicating and understanding design knowledge.
4.8 UNIANOVA of “negative” factor

Following the previous analysis of variance, a UNIANOVA was performed using the “negative” personality traits as the dependant variable. The respondent numbers and image codes remain the same as we are performing this analysis on the same data grouping.

Tests of Between-Subjects Effects

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>36.403a</td>
<td>14</td>
<td>2.600</td>
<td>1.028</td>
<td>.427</td>
<td>.064</td>
</tr>
<tr>
<td>Intercept</td>
<td>308.223</td>
<td>1</td>
<td>308.223</td>
<td>121.805</td>
<td>.000</td>
<td>.367</td>
</tr>
<tr>
<td>SexPic</td>
<td>0.439</td>
<td>1</td>
<td>0.439</td>
<td>0.173</td>
<td>.678</td>
<td>0.001</td>
</tr>
<tr>
<td>cutlery</td>
<td>0.713</td>
<td>2</td>
<td>0.357</td>
<td>0.141</td>
<td>.869</td>
<td>0.001</td>
</tr>
<tr>
<td>Gender</td>
<td>3.933</td>
<td>1</td>
<td>3.933</td>
<td>1.554</td>
<td>.214</td>
<td>0.007</td>
</tr>
<tr>
<td>ResAge</td>
<td>0.530</td>
<td>1</td>
<td>0.530</td>
<td>0.210</td>
<td>.648</td>
<td>0.001</td>
</tr>
<tr>
<td>Gender * ResAge</td>
<td>1.300</td>
<td>1</td>
<td>1.300</td>
<td>0.514</td>
<td>.474</td>
<td>0.002</td>
</tr>
<tr>
<td>SexPic * Gender</td>
<td>0.946</td>
<td>1</td>
<td>0.946</td>
<td>0.374</td>
<td>.542</td>
<td>0.002</td>
</tr>
<tr>
<td>cutlery * Gender</td>
<td>0.299</td>
<td>2</td>
<td>0.150</td>
<td>0.059</td>
<td>.943</td>
<td>0.001</td>
</tr>
<tr>
<td>SexPic * ResAge</td>
<td>0.784</td>
<td>1</td>
<td>0.784</td>
<td>0.310</td>
<td>.578</td>
<td>0.001</td>
</tr>
<tr>
<td>cutlery * ResAge</td>
<td>2.980</td>
<td>2</td>
<td>1.490</td>
<td>0.589</td>
<td>.556</td>
<td>0.006</td>
</tr>
<tr>
<td>SexPic * cutlery</td>
<td>7.819</td>
<td>2</td>
<td>3.909</td>
<td>1.545</td>
<td>.216</td>
<td>0.015</td>
</tr>
<tr>
<td>Error</td>
<td>531.396</td>
<td>210</td>
<td>2.530</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>4483.778</td>
<td>225</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>567.800</td>
<td>224</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. R Squared = .064 (Adjusted R Squared = .002)

Within this analysis, no statistically significant effect was found.
4.9 UNIANOVA of "Positive" factor

Further to the above, a UNIANOVA was performed on the positive factor. The results of this analysis are tabled below:

**Tests of Between-Subjects Effects**

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>2073.613&lt;sup&gt;a&lt;/sup&gt;</td>
<td>9</td>
<td>230.401</td>
<td>1.306</td>
<td>.235</td>
<td>.052</td>
</tr>
<tr>
<td>Intercept</td>
<td>92530.161</td>
<td>1</td>
<td>92530.161</td>
<td>524.607</td>
<td>.000</td>
<td>.710</td>
</tr>
<tr>
<td>SexPic * ResAge</td>
<td>1.186</td>
<td>1</td>
<td>1.186</td>
<td>.007</td>
<td>.935</td>
<td>.000</td>
</tr>
<tr>
<td>cutlery * ResAge</td>
<td>622.860</td>
<td>2</td>
<td>311.430</td>
<td>1.766</td>
<td>.174</td>
<td>.016</td>
</tr>
<tr>
<td>SexPic * cutlery</td>
<td>1921.049</td>
<td>5</td>
<td>384.210</td>
<td>2.178</td>
<td>.058</td>
<td>.048</td>
</tr>
<tr>
<td>Error</td>
<td>37745.276</td>
<td>214</td>
<td>176.380</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>534165.000</td>
<td>224</td>
<td></td>
<td></td>
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<tr>
<td>Corrected Total</td>
<td>39818.888</td>
<td>223</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> R Squared = .052 (Adjusted R Squared = .012)

A marginal effect [F (5, 214) = 2.178, p = 0.058] was identified. While this is slightly greater than 0.05, which is a common standard, the exploration of this effect was of interest. The result is displayed on the following page:
As discussed, the significance of this particular factor analysis is marginal, however the results provide us with an interesting narrative. The images where a female is displayed indicate that the perception of her varies wildly according to the cutlery she is using. The female using the “conventional/elegant” cutlery is perceived to be more positive (that is, that she has more of the positive personality traits as determined by the questionnaire) by the respondents. Not surprisingly, the “disabled” cutlery scores the lowest, with the “arthritic” cutlery splitting the two.

The male demonstrates an odd distribution. Respondents perceived the “disabled” male to be the most positive, with the “arthritic” cutlery scoring the lowest and the “conventional” cutlery just above midway between the results.
4.10 Conclusion

In this chapter we have detailed the data analysis undertaken within the research. The survey and its application have provided evidence to support the key hypothesis of this research; that a product as small as cutlery can have a significant effect on the perception of the user, specifically on female users.

Through the literature review, females who suffered from arthritis identified that they believed that the perceptions around them had changed; that they lost aspects of their femininity as they could not prepare food in the same ways that they could in the past, due to a loss of dexterity. Matthee, D. D. (2004) identified the importance of having “old hands” in food preparation in certain cultures, as the experience of the female would make the food “better” and that it was an important bonding experience with a younger generation.

The survey’s response was also unprecedented. 2902 participants from sixty-seven countries participated, with the greatest number being from Australia, India and the United States of America. This has given the survey an international perspective and has provided a significant amount of data for further research to be carried out.

It is also important to note that the images utilised within the survey did not display the subject’s hands and that the images went through many iterations to ensure they were as neutral as possible. The fact that the respondents judged the female to be less attractive with the adaptive aids, without seeing the condition of her hands or knowing if she had a disability in the first place, is a salient point for the value of aesthetics within product design. The following chapter will explore the implications of this finding in greater detail.
Chapter Five: Discussion of the Results

5.1 Introduction

The analysis undertaken has identified a gender effect in regards to the perception of adaptive cutlery. While there may be differing perceptions of cutlery, due to cultural, status, styling or other reasons, for the purposes of this study, this has been limited to the sample images and group. The literature review identified certain aspects of the culture of dining that are pertinent to this study. Sidenvall et. al (2006) suggested that for the older generation of females, the preparation of food is a gift for their families; that the act of this bestows a measure of self-worth towards the person in that they are capable of nurturing and providing for their family, even in their advanced age. Mathee, D.D. (2004) stresses the importance that this is placed in a growth context; that the mere act of learning to prepare food from one’s mother or grandmother is an essential part of woman- hood and to miss out on this is to miss out on a form of growth. Mathee also discusses the importance of cooking with “old-hands” – the food takes on a new dimension as the preparation of this has been taken with care and from a life of experience. Indeed, there are shelves lined with books that detail heirloom recipes and families who have “secret” recipes that are passed on through each generation.

The demonstrated effect of negativity in regards to the female gender poses an interesting issue of self-reliance and the ability to still prepare, cook and eat. The literature review isolates food preparation and provision for elderly females as a defining characteristic; while the women may not be able to lavish gifts or assist in other domestic means due to lack of mobility, finances or other concerns, the ability to provide food for not only their partner, but also their children and grandchildren, was demonstrated to be incredibly important.
5.2 Discussion and implications for female sufferers

While the “cutlery effect” was noticeable with “arthritic” cutlery, the “disabled” cutlery demonstrated the largest effect with the female model. The respondents perceived her to be significantly less stylish; this is no surprise as the outward appearance of the pieces are confronting. The form of a large foam grip with straps that would usually hold the user’s choice of cutlery would hardly flatter or impress any viewer. However, the “arthritic” cutlery was not perceived by the respondents to be as visually jarring; in fact the respondents rated it above the “elegant” cutlery. Perhaps due to the fact that these two (“arthritic” and “elegant”) pieces share a common typology (in that the handles and work areas of the utensil are vaguely similar), the effect of the image is not so drastic. It can also be hypothesised that the arthritic foam handled cutlery appears in the images to be more stylish than it is. This hypothesis could be tested in the future with a focus group, as conveying the subtleties of the product, such as the closed cell foam handles and thin steel, cannot be accurately portrayed via a computer screen.

Studies demonstrated that for females, the effects, onset and occurrence rates of arthritis are larger than in males. The demonstrated effect, that we perceive women differently than men when placed with the same forms of assistive cutlery, strongly suggests that the literature surrounding this issue (that ergonomic devices as a whole need to have aesthetics as a prime consideration) is true.

This finding correlates with the existing literature suggesting a gender “double standard” regarding aging. Wilcox,S. (1997) suggests that we judge women much more critically as they age in contrast to men. She posits:

“...In addition, not only is beauty more important in the lives of women, but the standards for women are more narrowly defined, more widely shared, and more salient than for men” (Wilcox, S. 1997)
This would certainly be evidenced within the findings presented in the previous chapter of this study and within the body of literature regarding disability and aging. However, Wilcox suggests that social comparison, when reaching a more advanced age begins to be more important; i.e. the maintenance of age-related appearance within the peer group. Aside from the fact that outsiders may judge the woman to be less attractive with the adaptive cutlery, this would be a “red-flag” within a peer group. Denoting that one member may be aging at a more rapid rate could be used as a negative benchmark – “my condition isn’t as bad as hers.”

The literature regarding the effect of arthritis on women is extensive and has been explored within this document. The significance of food and dining was also investigated. It is the ‘author's’ hypothesis that the cutlery effect demonstrated within this study and the body of literature presented make a compelling case for a wholesale rethink on the aesthetics of adaptive cutlery, if not aging-related materials for women.
5.3 Discussion and implications for male sufferers

There is a gender effect revealed in this study, as we identified within the analysis of the female image. Wilcox, S. (1997) suggests that we judge females more harshly in terms of how they look; the proliferation of anti-aging creams and other forms of cosmetic concealment aimed at women stands testament to this. The literature reviewed would also suggest that this is the case; we do not judge the man as harshly, therefore the stigmatising effect of the cutlery is reduced. One potential question this raises is would the man still utilise the aid in its current form?

The male model also poses an interesting narrative. The respondents preferred the male with “arthritic” and “disabled” cutlery as opposed to the male with the “elegant cutlery”. As a society we perceive men to be stronger and much more commanding (Deaux and Lewis, 1984) It is possible that the “elegant” cutlery provided a reverse effect as the man appeared more feminine and dainty. Through the factor analysis this wasn’t able to be determined, however from a product design perspective, the “arthritic” and “disabled” cutlery appears larger and bulkier in comparison, which are certainly more masculine traits.

However, looking at the man’s positivity scale in the previous chapter we see a different story. Again, it must be declared that the significance of this factor is marginal. However, the “disabled” cutlery scores high, higher than the “elegant” and “arthritic” cutlery. There have been significant amounts of research in regards to product gendering, but what is interesting is the study by Fugate, D.L. and Phillips, J. (2010) where food products, such as coffee, wine and potato chips were assigned a gender through the results of the study undertaken. While the masculinity of the cutlery was measured, the result was not significant and was omitted from the analysis. Further research is required to further validate the hypothesis that the cutlery’s styling could be viewed to be more masculine.

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5.4 Discussion and implications of the study in general

The significant gender effect supports the hypothesis posed at the commencement of the research. In various studies the appearance of ergonomic devices has been suggested as a large hindrance to their uptake, even if the products are useful, especially in a kitchen or dining context (Thyberg et al., 2004). This study has demonstrated that there is a significant effect, specifically in regards to cutlery. That if the device appears to be medical and the user is a female, her attractiveness suffers.

For items that are midway between, such as our “arthritic” cutlery, the effect is positive; more so than for the “elegant” cutlery. It is, much like many other products discussed in this research, down to the users’ own taste that provides the true hindrance to their usage and not from external pressures.

An interesting position can also be found in regards to the perception of disability. A study undertaken by Li, L. and Moore, D. (1998) suggests that:

“*The respondents with higher family incomes were more likely than those with low incomes to be associated with favourable acceptance of disability*”

(Li, L. and Moore, D. 1998).

The above quote has been explored, most notably by Adler et. al. (1994) who suggests that socio-economic status plays an intrinsic role in health, as the availability of medicine, hygiene, and nutrition positively affects acceptance and the ability to deal with health-related issues. Furthermore, Adler et. al. states that:

“*Life events presumably trigger perceptions of stress and negative emotion. These perceptions are known to alter neuroendocrine response and immune responses that may put persons at a greater risk for illnesses.*”

(Adler et. al. 1994)
In regard to the perception of disability, this position supports both the evidence within this study and the literature reviewed. Not only do the aesthetics of the product affect the initial uptake, the perception of the person utilising it, especially if female is severely affected. Yet, if the product was re-styled in a manner that would give the appearance of a luxury good, thereby inferring the image of a higher family income, there is the potential for a favourable level of acceptance which may have further flow on effects that can positively enhance the sufferer's condition. Certainly data extrapolated from the image of the female user of the “elegant” cutlery would support this.

Furthermore, the “masculinity” of the cutlery did not present to be a significant factor in the research. As Fugate, D. L. and Phillips, J. (2010) suggest:

“To maintain gender image integrity, consumers largely purchase products that have gender identities congruent with their own…” (Fugate, D.L. and Phillips, J. 2010)

While this is important with branded goods, such as athletic runners, brands of wine and automobiles, there is a distinct lack of branded “disability” cutlery. Greater awareness is required in this area to raise its profile and bring it to the same level as prescription spectacles – that is, styled to the point of desirability (Pullin, 2009).

Until the above occurs, the problem remains in getting the sufferers to be users of the devices. As has been demonstrated in this research, companies such as OXO have partially filled this need by creating attractive and usable items for the kitchen, however there remains the cutlery – OXO do not currently provide this. An online search of assistive devices also demonstrates a similar lack of “designerly” thought into the creation of cutlery and other serveware for disability users. However it is hoped this study highlights this need and influences further research in this area.
5.4 Conclusion

In the literature review, the discussion regarding the evolution of the handle highlighted that with the dawn of the industrial revolution came the mechanisation of the cutlery trades. Cutlery that was once highly ornamental with exotic handles had been relegated to the past as cutlery became flat. Ornamentation became part of the mechanical process, as forging stainless steel and etching patterns in the resultant pieces replaced carving ivory handles and insetting jewels. As the “arthritic” cutlery shown in the images has a thicker handle than the elegant cutlery, perhaps this could be a cue towards a design-led outcome?

The study suggests that the aesthetics of adaptive cutlery discriminate against women, with their appearance being seen as less attractive or stylish. As previously noted, the images did not display the hands of the models, therefore the only clue of disability is the cutlery displayed. This demonstrates the effect product styling can have in a disability context.

In the following chapter, the field of industrial design is explored to investigate the positive aspects it may have in this context. Various techniques are detailed that may assist in the development of an inclusive design future.
Chapter Six: Design as an agent for positive emotional satisfaction

6.1 Introduction

The previous chapters in this thesis have dealt with the specifics of designing for social inclusion and the issues surrounding this. This chapter will highlight the aspects of design that make the products desirable. This chapter places the research in a social context where there is an almost limitless choice of products that able-bodied users may engage with. As style is individual and unique, the sufferer’s (and the non-sufferer's) inability to positively differentiate himself or herself becomes a social hindrance. Portions of this chapter were presented at the International Conference of Designing Food and Designing for Food in London, 2012.

6.2 The "Designer" as a Professional

Design and styling have long been used as a differentiator of products since early history. Ancient Roman tunics were coloured according to status, with the rare imperial purple colour being used by royalty and the plain white for the plebs. The ancient Egyptians designed vast monuments, tombs and ephemera to assist the soul’s passage into the afterlife. Emblems, diadems and other semiotic devices were used to indicate status and position in society – these are all products of a designer. It could be argued that the role of the designer truly began during the industrial revolution, where products began to be mass manufactured and gave rise to the discipline of industrial design, where in the early 20th century people such as Raymond Loewy and movements such as the Bauhaus promoted designed artefacts. However in Sennett’s 2008 book, ‘The Craftsman’, he illustrates that the mere act of creating a product to a specification is a designed task:

“The carpenter, lab technician and conductor are all craftsmen because they are dedicated to good work for its own sake” (Sennett, R. 2008)
While I agree with Sennett’s argument, the word ‘designer’ (as opposed to Sennett’s “craftsman”) has unfortunately been misappropriated in society through constant misuse. Within the context of this research, we have referred to the designer in the context of an industrial/product designer; however, this definition differs from ‘styling’ in that the interactions between the product and its environment are considered beyond the immediate aesthetic concerns.

Many products, ranging from vases to lamps, have been touted as “designer”. Some illicit drugs, such as ecstasy, have been given the moniker of a “designer drug”. The dilution of the word “designer” gives rise to a spate of issues, the foremost being the definition and role of a professional designer. Guilds or professional bodies, such as the Design Institute of Australia (DIA), ensure their membership ranks are filled with only qualified “designers” from different streams, much the same as builders, plumbers and architects are in professional associations. However, unlike the aforementioned tradesmen who must operate and comply within a strict licensing structure, designers don’t share the same status or recognition.

Therefore, the ability and reputation of the designer is drawn upon years of honing the craft and learning to create the best solution possible, whether that be aesthetically or functionally. It is of great concern that people who have not undertaken the rigorous training, vetting and experience that are required of the industry can use the title of “designer” and issues, such as having unqualified or underqualified designers produce substandard products, not only reflect poorly on the industry but display a poor environmental conscience as the products may not have the longevity of a correctly designed and manufactured item.

Through the skills and abilities of a professional design team, items of various styles can be produced while retaining the same basic specifications given for a job or project. This is prevalent in the automotive industry, where a chassis is shared amongst models; however, the body and interior are styled independently. Gary Cowger, a former president of General Motors, states:
“The significance of Zeta and several other Greek-letter designated global architectures is that they will allow us to build a host of products based on interchangeable sets of components in any region around the world.”
(Cowger, G. 2004)

This form of differentiation through design allows individual tastes to be catered for and provides a sense of identity for the owner, while retaining a high level of serviceability. This method of “platform engineering” could be adapted to disability products in much the same way. For example, a fork could be designed and then stylistic and ergonomic modifications to the grip could be made, affording a larger user base the opportunity to use “designed” flatware.

It has also been demonstrated that “good” design sells. Hertenstein, Platt, and Veryzer, (2005) suggest that firms that prioritise good industrial design have a higher financial performance and brand awareness – While the definition of “good” design is entirely subjective, a principle defined by Dieter Rams aims to clarify this issue. It is of note that Rams was the lead product designer at the electronics manufacturer, Braun, and his “Ten Principles” has influenced several prominent designers within practice, including Apple’s Jonathan Ive (Hustwit, G. 2009).

Rams codified his design principles into ten statements that he sees as important to the creation of a “good” product, and are as follows:

*Good design:*

- Is innovative
- Makes a product useful
- Is aesthetic

---

8 Good industrial design in this context refers to the abilities and learned knowledge of the industrial designer to achieve a suitable outcome; this may be using the above mentioned model by Rams’ or another appropriate cultural/academic model, however the author is not referring to this directly.
• *Makes a product understandable*
• *Is unobtrusive*
• *Is honest*
• *Is long-lasting*
• *Is thorough down to the last detail*
• *Is environmentally friendly*
• *Is as little design as possible*

*(Vitsoe, 2012)*

The products that were manufactured under Rams’ tenure as design director at Braun are well regarded for their stripped-down aesthetics and usability, and are featured prominently in museums and collections of industrial design worldwide. While this model of designing is appropriate for specific types of products and aesthetics, it is merely one prominent example of an aesthetic and functional mode of thought. It is this appeal, marketability and consideration that the field of industrial design can give a product and allow it to reside in the home, or a museum.

Rams’ “good” design and the platform designing architecture of the automotive industry may seem to be at odds. One is focused primarily with creating a multitude of options using common components. The other is focused on a singular product with a well-considered use and a pared down aesthetic. However, these different ideals share a unifying trait; both methods create options for the end user at varying price points, and when executed by a qualified and capable industrial designer can not only bestow a sense of pride of ownership onto the user but also increase market share. If the product being designed, whether it be a walking frame, wheelchair or assistive implement for eating is well considered, attractive, functional, it could be priced at a point which allows the product’s positioning in the market to be either accessible or aspirational, much like OXO’s line of products.
6.3 Industrial Design for Medical and Therapeutic Use

As emotional beings, we become sentimental about products that have been passed down from generation to generation, such as – however it is hard to imagine that our grandparents’ disability cutlery or wheelchair could become a family heirloom.

In previous chapters we have explored Coleman’s suggestion that “bad design disables” (Coleman et al., 2006). Aside from the physical aspect, that poorly designed products hinder the user, the social and emotional aspect of the product, as previously explored in the research, can also disable the user in surprisingly unexpected ways. Consider the heirloom status of the aforementioned disability cutlery; Schifferstein & Zwartkruis-Pelgrim (2008) suggest that products that have a sense of self-extension, for which they use the example of a carpenter’s tools, a bond is formed between these and the user and they identify themselves with the product. One of the main factors discussed is longevity; through the use of a product that lasts, experiences and memories are attached to it usage. Price, Arnould and Curasi (2000) suggest that it is these memories of specific objects that an elderly user has interacted with is important, especially when planning a will or planning whom to give such items to. Should the item be manufactured in such a manner that will allow serviceability and usage for a long period of time, as well as being aesthetically pleasing, assistive cutlery may take on the form of an heirloom item, or at the least, create a bond between the original user and the person to whom it has been bestowed.

While the product itself is lightweight and fulfils the need of the user, it does not lend itself to the longevity discussed above, as the materials used are open-cell foam, plastic and thin steel. The maintenance of the product is decidedly unfriendly or unsympathetic to the needs of an arthritic patient; the foam handles need to be removed and hand washed separately, while the blade can be placed in the dishwasher. If the user also had a visual impairment this could become a hazardous task.
The appearance of the product, as previously demonstrated, shows a negative social effect toward females (refer to prev. chapter) and therefore is undesirable for use in a social setting. However not all areas of design for a medical or therapeutic use have been neglected, with the design of some medical spaces and machines becoming increasingly detailed and sympathetic to the users’ emotional needs. Magnetic Resonance Imaging (henceforth referred as MRI) machines, for instance, are becoming increasingly “attractive”, with designers considering the user and their experience inside these pieces of diagnostic equipment. The archetype of the MRI machine is that of a large box with a large diameter circular opening, in which the patient – lying supine on a sled – is pulled inside and scanned. Claustrophobia within these devices is widely reported; a study by Murphy and Brunberg (1997) suggested that out of 939 patients who underwent an MRI, 14.3% (n=134) required sedation to allow scanning. Of these patients, the largest requests for sedation were with brain MRI’s, where the patients head was immersed in the machine.

The design of MRI scanners has evolved significantly to allow larger diameter openings, or remove the need for an opening altogether. The Melbourne Radiology Clinic advertises that their scanner is “...16% wider than conventional MRI units, which suits claustrophobic and large patients” (Clinic, M. R., 2013). The interesting aspect is that the design of the machine is being advertised first, as opposed to the accuracy and fidelity of the scanning mechanism itself. Other manufacturers, such as General Electric (GE) and Hitachi further explore the ‘open’ aesthetic and alter the archetype significantly.

GE’s line of MRI machines – the ‘Signa OpenSpeed HD’ – help to alleviate the effect of claustrophobia by opening up a large portion of the scanning area and by providing a climate control system, allowing the patient to experience fresh air and light to stream in (Electric, 2012). The key benefit to the practitioner is that the patient is more comfortable, allowing the practitioner to scan and assess the patient with greater ease. The key benefit to the patient is that emotionally the stress of undergoing a scan is reduced, especially if the patient suffers from claustrophobia.
Aside from the patient’s emotional needs and the practicality afforded by the design of this product, the outward design of the product is much less “confronting” and far more aesthetically pleasing. Other manufacturers such as Hitachi have also produced machines with the open aesthetic, citing “…extraordinary comfort to the patient while also making examinations completely effortless” (Hitachi, 2012b).” When considering the study undertaken by Murphy & Brunberg, both of these machines help alleviate the stress of the cranial examination by providing a more open environment that would reduce the need for sedation.
Both of the units presented above demonstrate the importance of good industrial design for a medical use; not only does it benefit the patient’s emotions and help alleviate the stress of undergoing a scan, it also assists the technicians and doctors by affording them with calmer patients that do not require sedation. The outward design of both units also demonstrate a sense of aesthetic consideration; both machines differ from the archetype in their visual appearance, with swooping curves, soft edges and large open sections. These are significantly different to the archetype, which can be related to a front-loading washing machine. The interfaces found on the machines have been considered; these are restricted to three arced panels on the GE and one small square on the Hitachi; this gives the machine a much less cluttered appearance and keeps with Rams’ principles stated earlier in this chapter.
6.4 Design for Emotion

Through interactions and ownership of a particular kind of product a user can attribute an emotional value and currency; historically in the case of fine cutlery, traditionally this was through antique, heirloom and gifts from valued visitors. These would be prominently displayed and would be used at moments of great occasion and feast (Glanville, P. and Young, H. 2002). Although this form of collection would result in a clash of decorative styles, the owner would attribute a significant amount of sentimental value to these items. Many homes today have “the good dinner set” or a special teapot; in Donald Norman’s case there are three that give him immense satisfaction, yet they may not be the most expensive or rare items available (Norman, D. 2002). However, the way in which we use these items defines our personality, our tastes and our environment. The intrinsic value of industrial design is to elicit these emotions and provide the user with the satisfaction with a product beyond ergonomics and useability. The Juicy Salif citrus juicer by Phillipe Starck is one of the most pertinent examples as an expensive (for what it is) juicer that performs its task poorly. However, Alessi continue to sell the item and it has reached an iconic status, being exhibited at the New York’s Museum of Modern Art (MoMA, 2010).

Design has also had a large impact on mobile phones; the iconic Apple iPhone is desired by many, perhaps due to its impeccable industrial design and interface, yet its market share is dropping due to the proliferation of Android handsets (Canalys, 2011). Much like the previous statement about automotive platforms, Android handsets run a common operating system. Yet each phone manufacturer puts their own distinct touch to it, whether they modify the interface (as SonyEricsson have with the Xperia and Samsung with the Galaxy S) or they create highly styled cases, for which the internals are more or less identical. Design empowers the user to choose a product they feel they can identify with and they can accessorise with, yet the functionality of it remains a standard.
Adaptive cutlery does not have this luxury. While there are many types of assistive cutlery and utensils, a universal “one-size fits all” styling and manufacturing approach appears to have been maintained for the disabled, with either foam and beige plastics being the predominant material used for the handles and low-quality steel used for the work areas. Yet a person who may not have arthritis or grip related issues can purchase a non-assistive set of cutlery from a virtually infinite range of manufacturers and styles, in a materials range from biodegradable corn-starch to the finest silver.

An extrapolation of the idea of developing a range of styles based around a functioning standard can be found in watchmaking. Certain watchmakers, such as Marc Newson and Stepan Sarpaneva, use movements sourced from other watchmakers and style the case to their own specification. This means that many watches over a broad price range are effectively the same, yet due to the populations’ demand for choice the brands and subsequent models are numerous. Again, when watches for the disabled, specifically for the visually impaired, are investigated, one finds many mundane examples. However the Swiss luxury brand, Tissot, has produced a watch that still satisfies the emotional need of having a product of which to be proud of – the Silen-T (Tissot, 2011).

*Figure 6.4: Tissot’s Silent-T Watches (Tissot, 2012)*
The Silen-T assists the user in telling the time through a touch-sensitive bezel that vibrates discreetly, while the watch itself appears understated and elegant and still features the same Swiss movement as the other watches in the product line-up. Tissot also touts the universal design aspect of the product; that it is useful for businessmen who wish to be discreet in meetings in checking the time. In fact, this point precedes the information about this watch being suitable for the visually impaired.

The variable design potential for manufacturers of a wide range of familiar products is huge. As discussed in the research, users of adaptive aids feel discriminated and socially isolated due to the appearance of both the products they use and the stigma that is attached to their use. An alternate method of disability design is through the use of Kansei engineering that focuses on “emotional design”. This method was pioneered by Mazda and allowed the emotions of the user to be fully integrated into a product’s design and feature list. This approach allowed not only an ergonomically suitable product, but also one that satisfied the psychological needs of the user. For Mazda such concerns included handling, engine note, cabin layout and the “x-factor” for their automobiles (Axelsson et al., 2001).

Other Japanese automotive manufacturers, such as Lexus, place an emphasis on the designer/craftsman trade to ensure their products meet the emotional needs of the user and ensure a high level of detailing and quality control in a mass-produced item. Lexus famously creates a culture where highly skilled, long-serving employees are given the title of “takumi”. These employees are tasked in areas such as body stamping, engine dynamics and vehicle paint (Lexus, 2012). While this may seem excessive, this culture of care and attention to detail reinforces the fact that mass production still requires the eye of a well-trained human to ensure that the product is free from the imperfections that a mass-produced item may have and that cannot be detected by machine, such as loose fixtures and blemishes.

Kansei engineering’s goal of emotional satisfaction links in closely with Dilani’s “Salutinogenic” model of design influencing health; that product aesthetics can
create a positive emotional state. Harking back to Sennett’s “craftsman”, we can certainly argue the case for well-trained, professional industrial designers. While companies such as Mazda and Lexus can afford to have highly trained master craftsmen working in an almost savant-like role, ensuring an obsessive level of quality control, most firms cannot afford this level of expertise. It is within a formal education context that future designers, be it industrial, graphic or other, can learn the sensitivities of human interaction and imbue the resultant products with these values.

In light of the above presented design models, a potential solution to the situation of assistive cutlery may arise. Since we have established the perceptions of users through quantitative methods and have the pertinent data (i.e. the lack of style, elegance, thrifty appearance, etc.) a platform can be developed for disabled users. For example, if we apply ergonomic research to cutlery, we can define a minimum handle width, which can then be used as a parameter to develop a new product. In essence the parameters and data become the platform. From here users could be engaged and interact with the prototypes using a co-design model, which has been used to develop and understand the end use to great effect in the past (Taffe, S. and Barnes, C. 2009).
6.4.1 Virtual Prototyping Through Augmented Reality

One current trend of user interaction with products is through augmented reality. The consumer prints out, or is supplied with, an image that acts as a marker or target for the software. An example of a marker for a fork and knife is presented below:

![Augmented Reality marker for the application “SSTT Visualizer”; marker is author generated (2010)](image)

A website or application (such as SSTT Visualiser) is launched and the user then has the ability to virtually interact with a product or service through their screen. This method allows users to engage with products that may be aspirational, such as Boucheron jewellery (Boucheron, 2010) or Tissot watches (Tissot, 2010). While these augmented reality applications may be used for escapist reasons such as virtual window-shopping, their utility cannot be ignored.
One Australian website, Vision Direct, utilises a complex algorithm to scan the face of the user to place an accurate, 3D model of optical frames on the user. The advantages this has over the Boucheron or Tissot model is that this does not require the use of augmented reality markers; this would certainly assist in a disability context. Aside from the promotional and “gimmick” value of the application, therein lies a useful tool. The product can allow people with limited mobility or that live in remote regions to virtually try on a product. This may aid in alleviating some of the aspects of social isolation through the ability of “window shopping” and sharing the resultant images via social media for feedback. This is encouraged by the above-mentioned websites for obvious sales-related reasons; however, this does have merit as the photographs can assist the user in choosing a suitable style.

Furthermore, products could be virtually developed and launched and their appeal could be gauged via the users’ interaction. This next stage of emotional design and affective engineering could be achieved through entirely virtual means. Potential
areas of measurement may possibly include dwell time, the users facial response, potentially their iris dilation and the physical interactions they may have with it; with the Boucheron simulator, the user may decide to accessorise the virtual jewellery with their actual accessories or clothes, allowing the designers an unprecedented view into the intimate workings of their target market’s life.

For disability design this method could be used for research purposes and to drive the development of innovation in the field. Much like what was discussed before, a “chassis” could be created and stylistic variants could be displayed on a large screen, acting as a virtual mirror. This method would provide an element of participation from the patient, engaging them in the design of their product, be it cutlery or an artificial limb. This experience could be likened to visiting a tailor for a bespoke suit; instead of the cold environment of a surgery or laboratory, it could be far more inviting and comfortable, reducing the stress and trauma of the situation. The ability to also deploy this method via the Internet, much like Vision Direct, Boucheron and Tissot have, allows users with limited mobility to undergo “virtual fittings” of the product and to see them in a domestic context.
This method of design research was briefly explored by the author and is visually documented below:

Fig 6.2 – Prototype fork and knife, as visualised through SSTT Visualizer. All 3D models and images are author generated (2010).

Fig. 6.3 – Prototype fork “in use”, as visualised through SSTT Visualizer. All 3D models and images are author generated (2010).
This particular area of research, while pertinent and valuable to disability design, is too broad to investigate within the parameters of the thesis. As the main focus of the thesis is to establish a link between the styling of an ergonomic device and the perception of the person using it, the augmented reality testing would detract from the aim of the research. A significant amount of time would need to be dedicated to the creation of a focus group, the implementation of the hardware to view the models, and to generate the 3D models themselves. However, the early attempts presented are included in the research as proof-of-concept and to stimulate future research. Further development and exploration in a post-doctoral context would be useful as a development tool for large manufacturers who wish to launch an adaptive product and wish to test its aesthetic merit, as well as to continue the work of this thesis and complement the quantitative data with qualitative data detailing the user experiences.
6.5 Conclusion

In this chapter we have identified the value of industrial design as a discipline where research and production techniques can be applied to produce a high quality result that has broad appeal.

Craftsmen and artisans of the past would produce objects that could be tailored to the users’ individual requirements. However, this could be a costly investment and only available to affluent people in a pre-industrial society. While the industrial revolution gave rise to the discipline of industrial design and the “democratisation” of certain objects, it also led to the demise of heavily customised and tailored objects. Certainly, if one desired, they could still commission a cutlery set, however, one of reasonably high quality could be purchased for a far smaller price.

What has been illustrated in this chapter is that the days of the craftsman are returning. Through the usage of modern tools, such as 3D printing, CAD/CAM processes (such as CNC milling), 3D scanning and augmented reality, the designer has the ability once again to produce small-run, but cost effective products tailored to the needs of the end user.

There has also been much research and work in the field of emotional design; beyond the university context, auto manufacturers utilise Kansei engineering to ensure an “emotive” driving environment is experienced; medical equipment manufacturers are also considering patient needs in regards to feeling less claustrophobic or threatened when undergoing a CT scan – the desired effect on the patient is that they become more relaxed, which allows the technicians and doctors to perform their tasks with greater ease.

These advancements have come through the design process. While the field of engineering is an incredibly important one, engineers – through no fault of their own, sometimes neglect the human factor of emotion. However, one of the emerging characteristics of the discipline of industrial design is to place emotion at the
forefront of the design process. With both disciplines working in concert, alongside specialists, such as occupational therapists, doctors, marketers and importantly, the patient, adaptive devices, not only cutlery, could be manufactured with ease and be tailored to each person. The additional effect of desirability could also be achieved in this manner; much the same as a tailored suit or an architect-commissioned house uplifts the patron, so could a custom adaptive cutlery set, formed in silver or stainless steel.
Chapter Seven: Conclusion

7.1 Discussion

The research presented herein has demonstrated the effect that styling can have on an adaptive aid. Background research into the culture of dining has highlighted its key importance in social inclusion; that to share a meal enhances bonds between people. Especially when a meal served by an older, maternal figure is presented in such a way that the meal is considered a “gift”. The unfortunate reality that was discussed in the thesis was that the high incidence rate of arthritis could significantly hinder the social lives of sufferers through an unwelcome intrusion at mealtimes. The literature review highlighted that arthritis affects a large portion of elderly women, and that the socially isolating effects that arthritis posed to the sufferers, in some cases, denied them the “luxury” of eating in a social situation due to concerns over their own appearance and the appearance of their respective aids. Furthermore, the emotional and physical pain provided barriers, and in some of the examples presented herein, a loss of a maternal ability to provide a home-cooked meal, which caused a impact on the sufferer’s self esteem.

While there have been studies that have provided quantitative data in relation to ergonomic aids and studies investigating ergonomics for arthritis sufferers, no research was found that highlighted the emotional effect of adaptive cutlery. When taking the background research and literature reviews into consideration, it was important to conduct a large-scale quantitative-based investigation into the effect that the styling of assistive cutlery could have on the emotional wellbeing of an arthritis sufferer to better understand the extent of this effect. To undertake the research, stimuli were developed based on Canter’s “Room-Effect Method” and a twenty-six-question survey was used that was based on the “Big Five” factor analysis. This was deployed firstly in a convenience sample of first-year Swinburne
Faculty of Design students; this provided a result that was contrary to the literature – that the design of the disabled products was novel and attractive. Further research indicated that this may have been due to the young age of the respondents and that the sample group may have been too small and too homogenous.

The survey was then placed on a Swinburne University website, allowing the researcher to either verify or contradict the above finding, and access many respondents from various nationalities, ages and cultural backgrounds to investigate a snapshot of the world’s perception of adaptive cutlery and the people that use them.

The investigation found a significant gender-based product effect. Women were perceived to be significantly less attractive utilising the adaptive aids than men. The literature suggested that females are affected by arthritis in a far greater way; physically the strain of the condition takes its toll, but as the disease attacks the dexterity and grip strength of the hands it can also severely impact on the intrinsic maternal trait of caring for their families and providing a meal. While this can be construed as a sexist viewpoint, the literature review highlighted this through interviews with females who, in their advanced age, saw this as an important part of their femininity.

The research also identified that in the modern age, branding and maintenance of a public image have become important. As Generation X and Y get older, they will require a new set of metrics to which they can measure themselves; we have already identified this within the literature review, with elderly adults using the effects of aging to benchmark themselves against each other within their peer group.

The outcome of this research indicates that the styling of assistive cutlery, specifically aimed at the female market, is inadequate. The marked effect that cutlery has on the user was unexpectedly large, leading to an intense consideration of the effect other adaptive products might have, not only in the context of this thesis (arthritis), but in the wider medical field. If the research has highlighted one key point, it is that our perception of people who use adaptive aids, no matter how
small or insignificant they may appear, will lead us to see the person for their
disability and make an unfair judgement on their personal and social status.

Industrial designers are in a unique position when placed in the above context.
Provided with the right information, ergonomic framework and industry support
they have the ability to create a novel product that transcends the ergonomic
constraints of the disability, which can mask or obscure the disability and create an
object of desire. The background to the research indicated that the use of cutlery
was originally considered an affront to God and a vulgar statement; that the fingers
were a far superior implement than forks and knives and users of these items were
shunned and discriminated against. Over the course of centuries this position
changed dramatically. By the Victorian era, cutlery became the status symbol of
excess, wherein craftsmen and cutlers created flatware so varied and so specialised
that to obtain, display and use such items was the absolute zenith of indulgence,
etiquette and social stature. While cutlery has been a product that has been utilised
for centuries and has been mass manufactured, it is this symbolic excess where
assistive cutlery may take inspiration – while terrapin forks may no longer be used
due to turtle meat falling from favour, other devices, such as sculptural right-angled
spoons may take their place and become accepted, much as designer eyewear has.

Whilst the above change in social stigma towards flatware took the better side of
nine hundred years, the timeframe of the change in modern society toward
arthritic sufferers could be dramatically reduced, given the right circumstances.
With the advent of social media such as Twitter, Facebook and the like, new trends
and styles are born within moments and their impact is felt worldwide within
seconds. Should one of the current crop of “superstar” designers such as Phillipe
Starck, Jasper Conran or Karim Rashid take on the task, it is the opinion of the
researcher that positive change for people with disabilities in the realms of social
inclusion can happen in much the same way as their spectacle frames designed for
vision impaired users have. Whilst this may be wishful thinking, statistical data
presented earlier suggests that there is a large elderly population, especially within
OECD and industrialised nations. This fact, when taken into consideration with the
designer's own age may lead to these products beginning to make an appearance in the market within ten to twenty years, as opposed to eight-to-nine hundred years. Certainly the market would demand such products that take the emotional consideration of the user into account.

Further research in this field is required, and required within a fairly rapid timeframe if the above result is to be achieved. Current standards exist regarding design for disability; however, due to the myriads of forms that this may take, a semi-structured approach could be utilised. A proposed form of investigation that may provide further insight is by the usage of augmented reality as a rapid, easily deployable and wide-reaching method of stylistic evaluation. Through the augmented reality based evaluation a number of investigative outputs could be explored, such as the respondent's facial expressions, vocal exclamations, dwell time with the prospective product and how the product interacts with their environment as a whole; i.e. do they accessorize in concert with the product or in spite of the product. This research output could be achieved through standard computers and webcams today, with a bespoke website. A much more advanced scenario wherein the usage of 3D depth-scanning webcams, such as Microsoft's Kinect and a 3D monitor would allow the investigator to not only gather the above data but to output positional data that could be analysed in three dimensions, as opposed to a two dimensional image. As discussed in the thesis, should a “platform-based” ergonomic model be used, designers could creatively use this model in concert with the augmented reality data gathering to create stylistic and innovative alternatives to essentially the same class of object, much like the Formula One™ teams produce wildly different race cars within the restrictive bound of the same technical regulation.

To conclude this research on a note as optimistic as presented above, in light of the presented data is an unexpected benefit. The role of industrial design in the future of humanity will be increased as the population ages and the role of the researcher to investigate and formulate new methods of informing the innovators will also
increase to meet the needs and demands of the populace. It is of mutual benefit that both research and design become inextricably linked to produce such outcomes.
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Appendix 1 - Visual Review

Adults

Childrens

Disabled
To begin the composition, background images were required. The images sourced ranged from a café, home and restaurant environment. A table image was also sourced. The table centerpiece was removed using Adobe Photoshop and the table’s perspective was altered. An image of a female was selected; this image was chosen due to her pose – she appears to be reading a menu. The female was composited into the scene using Adobe Photoshop; again the perspective of the table was adjusted to suit the image. The resultant images were assessed by the design postgraduate research cohort and it was decided the appearance of the model was far too young, and that the cutlery should be viewed from the other side.

A new female was selected and altered to tone down her makeup, remove her jewelry and composited into the scene. It was also decided to remove the restaurant setting, for brevity.

Images of cutlery were sourced via the internet and were removed from their background and composited on top of the napkin that was found in the original image. The cutlery selected encompassed three main areas: an inexpensive, basic set, an expensive set and an adaptive set.

The images presented above were drafts; the modifications shown are in regards to the angle, scale and positioning of the cutlery. A decision was made to modify the cutlery to represent the most extreme scale – regular cutlery modified with adaptive foam handles. This would provide a “check” in the survey, as the aesthetics of the inexpensive flatware would be drastically altered.

For brevity, the “cafe” image was removed; the “home” setting included the text “This woman is about to eat her lunch” as a way of communicating the scenario to the respondent. The pilot test determined that the “expensive” cutlery was too unobtrusive and was not viewed to be worth as much as the other pieces. The cutlery was changed to a more traditional English-style silver service.

The final images include the tag-line and were deployed online to an international audience.
Appendix 3 – Final Stimuli

This man is about to eat his lunch with his cutlery

This man is about to eat his lunch with his cutlery
This man is about to eat his lunch with his cutlery.
This woman is about to eat her lunch with her cutlery.

This woman is about to eat her lunch with her cutlery.
This woman is about to eat her lunch with her cutlery.
Appendix 4 – Ethics Clearance

To: Dr Simon Jackson Design; Mr Gianni Renda
[BC: Mr Gianni Renda]
CC: Dr Keith Robertson

Dear Dr Jackson and Mr Renda,

**SUHREC Project 2010/068 Can design address the physical and emotional needs of an aging population, specifically in regards to ergonomic aids?**

Dr Simon Jackson Design; Mr Gianni Renda
Approved Duration: 25/05/2010 To 25/05/2011 [Adjusted]

I refer to the ethical review of the above resubmitted project protocol undertaken on behalf of Swinburne’s Human Research Ethics Committee (SUHREC) by SUHREC Subcommittee (SHESC4) at a meeting held on 30 April 2010. Your response to the review, as e-mailed on 19 May 2010 was put to a nominated SHESC4 delegate for consideration.

I am pleased to advise that, as submitted to date, the project has approval to proceed in line with standard on-going ethics clearance conditions here outlined.

- All human research activity undertaken under Swinburne auspices must conform to Swinburne and external regulatory standards, including the National Statement on Ethical Conduct in Human Research and with respect to secure data use, retention and disposal.

- The named Swinburne Chief Investigator/Supervisor remains responsible for any personnel appointed to or associated with the project being made aware of ethics clearance conditions, including research and consent procedures or instruments approved. Any change in chief investigator/supervisor requires timely notification and SUHREC endorsement.

- The above project has been approved as submitted for ethical review by or on behalf of SUHREC. Amendments to approved procedures or instruments ordinarily require prior ethical appraisal/clearance. SUHREC must be notified immediately or as soon as possible thereafter of (a) any serious or unexpected adverse effects on participants and any redress measures; (b) proposed changes in protocols; and (c) unforeseen events which might affect continued ethical acceptability of the project.

- At a minimum, an annual report on the progress of the project is required as well as at the conclusion (or abandonment) of the project.

- A duly authorised external or internal audit of the project may be undertaken at any time.
Please contact me if you have any queries about on-going ethics clearance. The SUHREC project number should be quoted in communication. Chief Investigators/Supervisors and Student Researchers should retain a copy of this e-mail as part of project record-keeping.

Best wishes for the project.

Yours sincerely

Kaye Goldenberg
Secretary, SHESC4
****************************************
Kaye Goldenberg
Administrative Officer (Research Ethics)
Swinburne Research (H68)
Swinburne University of Technology
P O Box 218
HAWTHORN VIC 3122
Tel +61 3 9214 8468
Fax +61 3 9214 5267
To: Dr Simon Jackson Design; Mr Gianni Renda  
[BC: Mr Gianni Renda]  
CC: Dr Keith Robertson, Research and Ethics Advisor, Design  
Ms Rachel Mosel, Research Admin. Co-ordinator, Design

Dear Dr Jackson and Mr Renda,

**SUHREC Project 2010/068 Can design address the physical and emotional needs of an aging population, specifically in regards to ergonomic aids?**  
Dr Simon Jackson Design; Mr Gianni Renda  
Approved Duration: 25/05/2010 To 25/05/2011 [Adjusted] Extension to 25/05/2012  
Project modification: March 2011

I refer to your e-mails of 25 February and 9 March 2011 in which you requested a modification to the protocol by a change to the recruitment process. You also requested an extension to the duration. The request was put to a delegate of the relevant SUHREC Subcommittee (SHESC4) for consideration.

I am pleased to advise that, as submitted to date, the modified extended project/protocol may continue in line with standard ethics clearance conditions previously communicated and reprinted below.

Please contact me if you have any queries about on-going ethics clearance, citing the SUHREC project number. Copies of clearance emails should be retained as part of project record-keeping.

As before, best wishes for the project.

Regards

Kaye Goldenberg  
Secretary, SHESC4  

**********************************

**Kaye Goldenberg**  
Administrative Officer (Research Ethics)  
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Appendix 5 – Statement of consent & questionnaire

SWINBURNE UNIVERSITY OF TECHNOLOGY

CONSENT INFORMATION STATEMENT

For paper and on-line questionnaires

Project Title:
Can design address the physical and emotional needs of an aging population, specifically in regards to ergonomic aids?

Dear participant,

You are invited to participate in a research project conducted in the Faculty of Design, Swinburne University of Technology. The Principal Investigator is Dr. Simon Jackson. The Associate Investigator is Professor Allan Whittfield. Both are full-time staff members of the Faculty of Design. Student Investigator: Gianni Renda.

The project is called “Can design address the physical and emotional needs of an aging population, specifically in regards to ergonomic aids?” and is a questionnaire for students at the Swinburne University Faculty of Design in Prahran, and an online survey.

The project is being undertaken to verify and demonstrate that ergonomic devices (ie. cutlery) can be discriminatory due to their aesthetics. Studies have demonstrated that people who have arthritis or reduced grip do not readily use ergonomic aids because they fear other people’s perceptions of them. This can result in social isolation, depression and in some cases, malnutrition. (Anderson et al., 2001), (Bugajska et al., 2003), (Sidenvall et al., 2000) Although various research articles and industry reports state the importance of adaptive cutlery, little academic research has been found detailing the actual perception of those of adaptive cutlery. It is intended that the research will have practical applications in the development of better products for sufferers of arthritis and make a significant contribution to the body of knowledge in the fields of ergonomics, emotional design and experimental aesthetics.

Privacy protection is of paramount concern. Whilst country of origin will be asked, no participant names will be recorded on the questionnaire and data will only be viewed by the research students and the supervisors. It will be kept under password protection in university and private computers. The hardcopy of data will be kept in locked filing cabinet in the Faculty of Design, Prahran. The data will be analyzed and represented in tables, charts and text for publishing by the researchers in articles.

Every participant is free to discontinue participation in the questionnaire at any time.

Your completion and return of this questionnaire constitutes consent.
To thank you for your time and effort we are offering those participating in one of three research projects, including this one, the chance to win a 16MB iPod nano valued at $249. Should you wish to enter the draw, please click on this link to another page which outlines further information on the prize draw and requests your contact details. You need to enter into the draw by 1 March 2011 and the winner will be chosen at random. The winner will be notified on 1 March 2011. Please note that entry into the draw is quite separate and is not linked to your anonymous responses to the on-line questionnaire.

For further enquiries contact
Deputy Dean Research
The Faculty of Design
Building PA 144 High Street
PRAHRAN, VIC 3181, AUSTRALIA
Phone: +61 3 9214 6832

This project has been approved by or on behalf of Swinburne's Human Research Ethics Committee (SUHREC) in line with the National Statement on Ethical Conduct in Human Research. If you have any concerns or complaints about the conduct of this project, you can contact: Research Ethics Officer, Swinburne Research (H88), Swinburne University of Technology, P O Box 218, HAWTHORN VIC 3122. Tel (03) 92145218 or +61 3 92145218 or resethics@swin.edu.au
By completing this questionnaire you are allowing us to use this information for our research.

This questionnaire is anonymous and no record will be made of your identity.
Introduction

This research is carried out by Gianni Renda, a PhD candidate at the Faculty of Design, Swinburne University of Technology, Melbourne, Australia. Kindly complete the questionnaire. Your cooperation is appreciated.

Instructions

1. Please complete all the questions in the order which they occur.

EITHER: Please circle appropriate answers

  e.g. Gender
  a) Male  b) Female

OR Write your answer in where necessary

  e.g. your age

  30 years

OR Many questions involve 9 point rating scales. The extremes are located at each end of the scale (left negative – right positive). Please circle the number that best expresses your opinion. (Circle one box only).

  e.g. He looks stylish.

Example a)

Disagree 1 2 3 4 5 6 7 8 9 Agree

Example b)

Disagree 1 2 3 4 5 6 7 8 9 Agree

In example a) the circle 9 indicates that you agree that the person looks stylish

In example b) the circle 6 indicates that you slightly agree that the person looks stylish.

2. Please read each question carefully and treat each response separately despite any apparent repetition.

3. If you have any problem understanding or completing the questions please ask the administrator for help.

Thank you for your cooperation.

Your answers to the questions will be treated in confidence.
Section 1: About yourself

Please answer the following. You must be over 18 years of age:

1. Your age
   
   _______ years

2. Your gender
   a) Male  b) Female

3. Your country of origin
   
   _______________
Section 2: Questionnaire

In the picture above, a woman has her cutlery. Can you please give your impression of her by answering the questions below.

1. How tall do you think she is? (in cm)
   140  145  150  155  160  165  170  175  180  185  190

2. How heavy do you think she is? (in kg)
   40  45  50  55  60  65  70  75  80  85  90  95  100

3. How old do you think she is?
   _______ years.

4. What level of education did she achieve?
   Up to year 9  Up to year 12  Technical & further education (TAFE)  Up to Degree  Up to Post Graduate

5. What do you think her annual income would be?
   20k  30k  40k  50k  60k  70k  80k  90k  100k

In the picture above, a woman has her cutlery. Can you please give your impression of her by answering the questions below.

6. What would her IQ be? (100 is average)
   60  70  80  90  100  110  120  130  140

7. What type of job would she have?
   Professional  Semi-professional  Manager  Skilled  Semi-skilled  Unskilled  Manual

8. She looks like she has a positive attitude to life.
   Disagree  1  2  3  4  5  6  7  8  9  Agree

9. She is creative.
   Disagree  1  2  3  4  5  6  7  8  9  Agree
In the picture above, a woman has her cutlery. Can you please give your impression of her by answering the questions below.

<p>| | | | | | | | | | | | | | | |</p>
<table>
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<tbody>
<tr>
<td>10. She looks friendly.</td>
<td>Disagree</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>Agree</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>11. She looks unstable.</td>
<td>Disagree</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>Agree</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. She looks masculine.</td>
<td>Disagree</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>Agree</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>13. She looks trustworthy.</td>
<td>Disagree</td>
<td>1</td>
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<td>9</td>
<td>Agree</td>
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<tr>
<td>14. She looks anxious.</td>
<td>Disagree</td>
<td>1</td>
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<td>9</td>
<td>Agree</td>
<td></td>
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</tr>
<tr>
<td>15. She is elegant.</td>
<td>Disagree</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<td>7</td>
<td>8</td>
<td>9</td>
<td>Agree</td>
<td></td>
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</tr>
<tr>
<td>16. She looks sporty.</td>
<td>Disagree</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>7</td>
<td>8</td>
<td>9</td>
<td>Agree</td>
<td></td>
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</tr>
<tr>
<td>17. She looks stylish.</td>
<td>Disagree</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<td>7</td>
<td>8</td>
<td>9</td>
<td>Agree</td>
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<tr>
<td>18. She looks open to new ideas.</td>
<td>Disagree</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>7</td>
<td>8</td>
<td>9</td>
<td>Agree</td>
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</tr>
<tr>
<td>19. She is attractive.</td>
<td>Disagree</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
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<td>9</td>
<td>Agree</td>
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</table>
In the picture above, a woman has her cutlery. Can you please give your impression of her by answering the questions below.

<p>| | | | | | | | | | |</p>
<table>
<thead>
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<tbody>
<tr>
<td>20. She appears generous.</td>
<td>Disagree</td>
<td>1</td>
<td>2</td>
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<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>21. She looks reliable.</td>
<td>Disagree</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>22. She looks efficient.</td>
<td>Disagree</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>23. She looks organised.</td>
<td>Disagree</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>24. She appears kind.</td>
<td>Disagree</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>7</td>
<td>8</td>
</tr>
<tr>
<td>25. She looks vulnerable.</td>
<td>Disagree</td>
<td>1</td>
<td>2</td>
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<td>7</td>
<td>8</td>
</tr>
<tr>
<td>26. The cutlery is expensive.</td>
<td>Disagree</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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</tr>
</tbody>
</table>
Appendix 6 – Change of thesis title

14 December 2012

Mr Gianiri Renda

Dear Gianiri,

RE: CHANGE OF THESIS TITLE
I am writing to advise you that your application to change the title to your thesis was executive approved by the Director of Graduate Studies on 12/12/2012.

The approved title is, as requested:
Design for social inclusion: A study investigating the emotional effects of adaptive cutlery.

Yours sincerely,

Prof Pam Green
Director of Graduate Studies
Swinburne Research
Tel +61 3 9214 5224
Email pamgreen@swin.edu.au

cc: Dr J Jackson
    Dr D Barron
    Rachel Moses
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