The Product Effect: Do Designed Products Convey Their Characteristics To Their Owners?

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ABSTRACT

Malaysia is unique within the Islamic world in developing a motor car industry that is geared towards both internal and export markets. After achieving initial success, its export performance has failed to match that of its international competitors. Factors that are suspected to contribute to this failure is in the technology and styling of its models. Moreover, with the implementation of AFTA (Asean Free Trade Area) in Malaysia, the car industry is expected to face the influx of inexpensive established brands from ASEAN countries which will gradually dominate the local market. The research was cross-cultural and tested for possible differences based on nationality and gender. It used qualitative and quantitative techniques consisting of a Car Positioning Task using Semantic Differential scales and a derivation of the Room Effect method in order to investigate the perception of cars and its effect upon the perception of its owner. The pilot and actual surveys using Room Effect method were carried out with international participants. The results indicated that it is reliable and can be used to reveal cultural and gender differences. The research also indicated that the Room Effect method is practical for application to the car industry.
This thesis marks the conclusion of a three year PhD program in Design at the Faculty of Design, Swinburne University of Technology, Melbourne, Australia. It has been a very challenging and beneficial experience in Australia for me.

I would like to acknowledge the individuals who have assisted me in various ways upon the completion of this study. First and foremost, I would like to thank my research supervisors, Professor Dr TW Allan Whitfield and Dr Simon Jackson for their excellent guidance throughout this course. They have successfully guided me through some stressful times and were always willing to sharpen my understanding in this study and other academic writings. Without their valuable insightful comments and advice, I would have been lost.

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Finally and most importantly, would like to extent my gratitude and affection to my beloved wife, Suzlene Zakariah and children, YM Raja Ahmad Daniel and YM Raja Ahmad Mukhreez for providing me with their patience, support, love, encouragement, and inspiration that has greatly facilitated the completion of this challenging work.
SIGNED DECLARATION

This thesis contains no material which has been accepted for award of any other degree or diploma, except where due to reference is made in the text of the thesis. To the best of my knowledge, this thesis contain no material previous published or written by another person except where due references is made in the text of the thesis.

Signed

Raja A. Azmeer

Date
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# LIST OF ABBREVIATIONS

1. CBU  Complete Build-Up
2. BMW  Bavarian Motor Works
3. Proton  Perusahaan Otomobil Nasional
4. Perodua  Perusahaan Otomobil Kedua
5. TNS  Taylor Nelson Sofres
6. AFTA  ASEAN Free Trade Area
7. ASEAN  Association of Southeast Asian Nations
8. CKD  Completely Knock-Down
9. CML  Completely Made Locally
10. Inokom  Industri Otomotif Komersial Malaysia
11. MTB  Malaysian Truck and Bus
12. Petronas  Petroliam Nasional
13. MC  Mitsubishi Corporation
14. MMC  Mitsubishi Motor Corporation
15. PNB  Permodalan Nasional Berhad
16. MBM  Med-Bumi-Mekar
17. UMW  United Motor Works
18. DRB  Diversified Resources Bhd
19. MAA  Malaysian Automotive Association
20. NCP  National Car Project
21. HICOM  Heavy Industries Corporation of Malaysia
22. CIF  Cost, Insurance and Freight
23. OTR  On The Road
24. CEPT  Common Effective Preferential Tariff
25. MFN  Most Favoured Nation
26. MSP  Multi-Sourcing Parts
27. NEAC  National Economic Action Council
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<tr>
<td>CAC</td>
<td>Chery Automobile Corporation</td>
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<tr>
<td>Gen 2</td>
<td>Generation 2</td>
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<td>Avg</td>
<td>Average</td>
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<td>Mth</td>
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<td>PSA</td>
<td>Peugeot Société Anonyme</td>
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<td>AG</td>
<td>Aktiengesellschaft</td>
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<tr>
<td>HOG</td>
<td>Harley Owners Group</td>
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<tr>
<td>SL</td>
<td>Second Life</td>
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<td>3 D</td>
<td>3 Dimensional</td>
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<td>SUV</td>
<td>Sport Utility Vehicle</td>
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<td>JD</td>
<td>James David</td>
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<td>RDA</td>
<td>Research Data Analysis</td>
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<td>Snr</td>
<td>Senior</td>
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<td>MEG</td>
<td>Magnetoencephalography</td>
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<td>FMRI</td>
<td>Functional Magnetic Resonance Imaging</td>
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<td>PrEmo</td>
<td>Product Emotion Measurement instrument</td>
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<td>TV</td>
<td>Television</td>
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<td>AUD</td>
<td>Australian Dollar</td>
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<td>FFM</td>
<td>Five Factor Model</td>
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<td>SPSS</td>
<td>Statistical Package for the Social Sciences</td>
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<td>MARA</td>
<td>Majlis Amanah Rakyat</td>
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1 RESEARCH BACKGROUND

1.1 Topic Area

After 32 years, the existence of the first Malaysian national car company Proton is threatened. A major factor that has led to this situation is the gradual elimination of a "protectionist" policy by the Malaysian Government, which had previously given the local industry an advantage in terms of price of Complete Build-up (CBU) units. This change will have a substantial impact on Proton in the future, and will be a big challenge for the company, as it will have a significant impact on their sales. However, even when the local automotive industry was protected by the Malaysian government, there is evidence to show that the Malaysian public still preferred to purchase imported cars, although inexpensive prices were offered by the local car manufacturer. This is still the case. A recent study has shown that the Japanese cars Honda and Toyota are Malaysian favourites in the non-luxury segment, while Mercedes and BMW are the luxury car of choice in the country (Schouten, Martin & McAleXander 2005). This indicates that in future Proton will be facing threats from these established automotive companies as they are more advanced in terms of design and technology. Thus, Proton needs to clarify its direction in order to match the standards of its competitors.

In terms of car sales, Proton has been losing money and market share in Malaysia. The decline started in 2003 when the Proton market share slid from 60% to 48%, then gradually decreased to 44% in 2004 and dramatically fell to 40% in 2005 (Keay 2004; Netto 2005). At the same time, the company has been slow to market itself effectively around the world (Zafar & Humphreys 2008). As competition among local automotive companies increased, Proton’s domestic sales position fell to second place in 2007, when they lost their lead to rival Perusahaan Otomobil Kedua Sdn Bhd (Perodua) for the first time (Schweinsberg, Chrysler & Diem 2006). Perodua became the best-selling brand with a 33.3% market share, with 162,152 units sold. Proton, which saw its worst year in 2007, was rescued by release of the Persona,
the latest 1.6 litre sedan, which was very well received. With the domination of Perodua, Malaysia’s second national car, the domestic sales position of Proton in 2006 and 2007 indicated that consumers had lost their confidence in the company (Chips 2008; Schweinsberg, Chrysler & Diem 2006). This has not only affected the local market sales, but the international market as well. Furthermore, it has impacted not only on Proton, but also on the Malaysian government, as Proton is fully funded by them.

1.2 Research Question

It is probable that Proton’s failure is not in its technical performance, but rather in the styling of its models. A study of the Malaysian automotive market conducted by TNS Automotive, a company which carries out research for automotive manufacturers, asked car-owners what they thought of rival brands. The responses indicated that Proton was weak in providing “extroverted need states“, such as attraction and popularity. Moreover, the current trend shows that car buyers seek stylish designs (Savage 2005) in order to express their social identity, which Proton is not supplying.

For Proton designers, their priority is to produce attractive concepts or styling in order to meet the expectations of target consumers. However, it is possible that studies on users" perceptions are not carried out before the design concept or styling is finalized, so that designers do not know what users’ perceptions are. Understanding the user’s perception of the finalized artifact is significant, as it gives an idea for further development in fulfilling the consumer’s requirements. Furthermore, as Proton cars are globally exported, the study of user perception is significant in order to understand and clarify cultural differences and similarities in the response to automotive design.

Therefore, this research concentrates on the perception of international participants towards Proton cars, enabling the clarification of user perception across various cultures. As cars are considered a “status symbol“ and as such are an essential prop in the search for social recognition (Davison 2004) and are often seen with their owners, it is significant to know the association between the product and the person. This research is based on one research question and two subsidiary questions which were formulated after a review of existing knowledge of methods for studying user perception:
Is there an effect that a product has upon how people perceive its owner?

i) Are there cultural differences?

ii) Are there gender differences?

Based on the research questions, a study was undertaken which covered a range of areas related to the study of human perception of products, such as personality psychology, environmental psychology, product psychology, and existing consumer marketing strategy in the automotive industry. The study compared various methods used in these fields in order to obtain a suitable research method. As the research question is about perception and cars, which are associated closely with human self-image, it was important to identify an existing research method that involved humans together with a product during the testing. A method used in Environmental Psychology called the „Room Effect“ was found to meet these requirements. Hence, this research will tell us how the design of a car can affect a person’s judgment of another person.

1.3 Significance to Knowledge

This research will hopefully provide to new knowledge to the car industry and the academic field. For the car industry, this research is based on the study of existing consumer marketing strategies in the automotive industry. It offers a practical application in terms of market research methods of product perception using the „Room Effect“, which is new to the car industry. Therefore, this research may benefit Proton in terms of producing a better perceived car for future models. In addition, it will assist in changing the designers’ mindset towards the role of research so that they appreciate how research can provide knowledge about fulfilling consumers’ affective needs in car design. The research also contributes to the field of experimental aesthetics, especially in the study of perception in product design where there is no existing method involving visual pairing of a human model together with a product to understand the effect bestowed upon the user. Finally, as well as applying this method to understand consumer’s perceptions of cars, researchers may also be able to apply this method to other products that relate to human self-image.
1.4 Research Gap and Its Existing Knowledge

A review of the literature shows that limited information is available concerning product personality particularly with regard to cross-cultural questions and automotive consumer research. Research by Govers and Schoormans (2005) on product personality only used product variants from ordinary product classes such as screwdrivers and soap-dispensers for stimuli on user perceptions. High status products such as cars, which are more related to user image and personality, were not included in their study of product personality. In the field of cross-cultural studies only a small number of studies relate to product design. Furthermore, it seems that no research has been undertaken on car styling in relation to cross-cultural questions, especially in the design field. There is only a limited amount of data in the area of automotive market research in the academic journals. Most of the data gathered for this study is based on non-academic reading materials such as automotive magazines and newspapers.

In terms of existing market research on car companies, there are a number of studies that concentrate on design in relation to customer satisfaction. However, none of these provide in-depth studies of user affective needs. The existing consumer market research methods involve the respondent’s judgement towards the car alone and do not include humans together with cars. As for research method, the „Room Effect” technique has not previously been tested on ordinary product classes or high status products as stimuli. This method has so far been used only in Environmental Psychology, in the environmental perception paradigm, where the focus is upon the experience of settings and places, and upon the processes and factors influencing the varied impressions formed of environments by observers. Thus, there is a need for research to identify user affective needs, which can be considered an important element in producing affective design. Most automotive companies used qualitative research, such as participatory interviews, in order to find out user perceptions of products. There has been little use of quantitative methods to discover user perceptions. Further, there are no studies using qualitative research to investigate user perception using person together with product. The research applies this method to study perception of cars.
1.5 Outline of the Thesis

Chapter 1 presents an overview of the research. It explains the reasons for selecting the Proton car as a case study, based on the decrease in its market share and sales. The chapter generally identifies the topic areas, formulates the research question, explains the process of investigation, and considers the contribution of the research to new knowledge. It then describes a new research data collection method developed specifically for car marketing, and design research that borrows from other disciplines.

Chapter 2 considers the background of Proton, in order to understand how the company is being challenged by both international and local cars, in terms of market share and sales. In this chapter, the protectionist policy imposed by the Malaysian government to assist Proton and other locally made cars is explained. This chapter also includes the threat of the ASEAN Free Trade Area (AFTA) and the changing global automotive industry, especially imports from China.

Chapter 3 reviews the academic literature on marketing research data methods used by automotive firms, research strategies, and data collection methods used in marketing and design research, perception study on products and cross-cultural study.

Chapter 4 explains the research method and rationale. The Room Effect and the Five Factor Model (FFM) of personality and Semantic Differential methods were selected. Qualitative and quantitative surveys are used to discover how the Proton car is being perceived, and the results of both approaches are combined and employed as reference in verifying whether the method could be applied to automobile.

Chapter 5 explains the process of testing the „meaning” of a car to its user, also known as the „car positioning task”. Overall, this chapter elaborates the method of preparing the stimuli and positioning it on the visual axis, consisting of „evaluation”, „social” standing, „potency”, and „activity”. A convenience sample of students was asked to rate cars in terms of their activity, from Cherry (China) to Ferrari (Italy). Finally, the results and analysis of this test are presented.

Chapter 6 explains the process of testing the impact of the product (car) context on the judgements made about the person seen (the owner), which is called the „Room
Effect” method, developed by Canter, West and Wools (1974). This chapter also gives details of the selection of participants, the procedure for gaining informed consent and the protection of rights of the participants, the process of preparing the questionnaire for the pilot study, and finally the methods of data collection and data analysis.

Chapter 7 explains the final survey study. This chapter clarifies the selection of participants, the process of justifying and preparing the actual study questionnaire, data collection methods, and data analysis.

Chapter 8 presents the discussion and conclusions. It explores the findings which answer the research question formatted earlier. The limitations and the areas for further research are also discussed, in order to support the recommendations for future „Product Effect” tests on cars.
2 MALAYSIAN CAR INDUSTRY

2.1 Introduction

Since this research is related to the Malaysian automotive industry focussing on Proton cars, it is necessary to study factors that have affected the industry in the past and continue to do so. The factors include the earlier development of the industry, the implementation of the Malaysian government protectionist policy, the current sales and market share of Proton, factors contributing to Proton’s failure to compete, and changes in the global automotive industry relating to the potential threat from the Japanese and Chinese car industry. An understanding of all these issues is important for the local car industry, namely Proton, in its efforts to position itself as a local and global player.

2.2 The Importance of the Automotive Industry

The automotive industry involves the design, development, manufacturing, marketing, and sales of motor vehicles, which is significant for the economic development, industrial organization, technologies, and the standard of living of producing countries (Rosli 2006). It is considered the single largest manufacturing sector in the world (Turnbull, Oliver & Wilkinson 1992). More than 10 per cent of Japanese and American industrial output is derived from this industry alone (Smitka 1991). The automobile industry is one of the drivers of world economic growth and has the potential to shape “how we make things……, how we work….., what we buy, how we think and the way we live” (Womack, Jones & Roos 1990 p. 11).

Through automotive industry, „strong inter-industry effects” can be created by direct and indirect link to other industry sector. According to Jan and Hsiao (2004) “the automotive industry can drive the development of related industries, particularly the mechanical and electronics industries. Such effects are inevitably of major interest to the government and public” (p. 1147). Moreover, Rosli (2006) states that:
Efforts to develop the automobile industry have significant impact on resource-based industries, such as iron and steel, chemical, nonferrous metal, rubber and plastic-related industries as well as petroleum-based industries; and on non-resource based industries, namely electrical and electronics-related parts. In the tertiary sector, it provides service-related activities, such as stamping, repairing, designing and engineering, banking, shipping, storing, insurance, and distributing and marketing channels. Significantly, the automobile industry requires a set of production systems linking a wide range of industrial organization technologies, with great variations in size and sophistication (p. 91).

Figure 2.1 shows a clear picture of the link between industry sectors that contributes to the employment opportunities.

![Figure 2.1 – Automotive Industry](source: author's own)

Besides linking many types of producing firms, from material producers to intermediate and capital manufacturers and final assemblers, the automotive industry creates employment opportunities. For instance, “Taiwan had a total of 448 automotive industry companies at the end of 1999, employing approximately 90,000 people excluding sales and after-sales maintenance personnel. Moreover, the China automotive industry comprised of 2,426 companies employing almost 2 million people at the end of 1998” (Jan & Hsiao 2004 p. 1147).

The automotive industry plays an important role in the success of economic development worldwide. An additional advantage is that this industry provides
significant job opportunities and develops expertise amongst local communities through technology transfer and joint-venture with multinational automakers.

2.3 Malaysian Experience in Automotive Production

The Malaysian automotive industry began in 1962. The Ford Motor Company of Malaya was the first company that started operations with 16 employees, fitting wheels, doing body repair, and paint touch-up work in rented shop-houses in Singapore. Based on this small operation the Federal Government realized the potential of the automotive industry, and in September 1963 announced its intention to encourage the establishment of an automobile industry as part of an industrialization programme. In May 1964, the government announced its initial policy on automobile assembly (Simpson, Sykes & Abdullah 1998). Assembly plants were set up in the late 1960s in order to provide employment and as a substitute for automobile imports (Iswalah 2002).

The development of the automotive industry in Malaysia took place in two phases, involving the development of three processes that consisted of Completely Built-Up (CBU) units, Completely Knock-Down (CKD) units and finally, Completely Made Locally (CML) units.

During the first phase of the automotive industry development, which stressed the Import Industrialization Strategy, the emphasis was on the assembling activities of both passenger and commercial vehicles, in order to provide employment and reduce import bills (Rosli 2006). Automotive companies started with Completely Built-Up (CBU) units, which were used to assemble foreign made cars such as Volvo, Peugeot, Mazda, and Nissan. These were later replaced by Completely Knocked-Down (CKD) packs, meeting the local content requirement to promote the growth of components manufacturing. Producing CKD packs provided opportunities to local components makers and increased employment. Changes in the Malaysian automotive industry happened when the government decided to produce Completely Made Locally (CML) cars. Local national car companies included Perusahaan Otomobil Nasional (Proton), Perusahaan Otomobil Kedua Sdn. Bhd. (Perodua), Industri Otomotif Komersial Malaysia (Inokom), and Malaysian Truck and Bus Sdn. Bhd. (MTB).
When Tun Mahathir Mohammad was elected as the fourth Prime Minister of Malaysia in 1981, a new emphasis came into effect with the government policy oriented towards building a heavily industrialized and advanced nation. The second phase began with automobiles produced by four national car companies.

The „National Car Project“ (NCP) was launched in 1981 through the company Perusahaan Otomobil Nasional (Proton) as a joint venture with Mitsubishi Motors Corporation of Japan. The first production began with the Proton Saga model in 1985 (Iswalah 2002). The shareholders were Petronas (Petroliam Nasional) (27.17 per cent shareholding), Khazanah Nasional Berhad (17.96 per cent), Employees Provident Fund Board (with 11.02 per cent), MC Mitsubishi Corporation (8.03 per cent), (MMC) Mitsubishi Motor Corporation (8.03 per cent), and other local and foreign investors with 27.79 per cent shareholding (Billette & Ryan 2001).

Perusahaan Otomobil Kedua Sdn Bhd (Perodua) was introduced in 1993 (The Star 2009), supported by two government-backed companies, namely PNB (Permodalan Nasional Berhad), Equity Resource Corp. Sdn. Bhd., and Med-Bumi-Mekar (MBM) Sdn. Bhd. The remaining shares were allocated to private companies from Malaysia and Japan (see table 2.1). Later, the share structure changed so that the Japanese Daihatsu held a majority shares (Rosli 2006).

<table>
<thead>
<tr>
<th>Companies</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>PNB (Permodalan Nasional Berhad) Equity</td>
<td>10%</td>
</tr>
<tr>
<td>Med-Bumi-Mekar (MBM) Sdn. Bhd.</td>
<td>20%</td>
</tr>
<tr>
<td>UMW Corp. Sdn. Bhd.</td>
<td>38%</td>
</tr>
<tr>
<td>Daihatsu (M) Sdn. Bhd.</td>
<td>05%</td>
</tr>
<tr>
<td>Daihatsu Motor Co. (Japan) Ltd</td>
<td>20%</td>
</tr>
<tr>
<td>Mitsui &amp; Co. Ltd</td>
<td>07%</td>
</tr>
</tbody>
</table>

Table 2.1 – Perodua share structure *Source: (Rosli 2006)

Perodua has its own market niche and focuses on producing cheaper and smaller cars for that market. It is known for producing fuel-saving cars for middle and lower income groups. Since beginning operations, it has produced various models such as the Kancil, Rusa, Kembara, Kenari, Myvi, and Viva. Kancil was the first model introduced by Perodua. In 1996, 283 units of Kancil were exported to countries such as Brunei Darussalam, Cyprus, Malta, and Mauritius. Due to high demand, the Perodua export market increased to 2,322 units at the end of 1998. This also include expansion of the export destination to include countries such as Comoros,
Cyprus, Egypt, Fiji, Jordan, Lebanon, Malta, Mauritius, Qatar, Singapore, Sri Lanka, the United Kingdom, and Yugoslavia (Iswalah 2002).

In the same year as Perodua, Industri Otomotif Komersial Malaysia (Inokom) emerged in the Malaysian car market manufacturing subcompact cars. Inokom is one of the automakers that produces non-national automobiles such as Renault (European-based vehicles) and Suzuki (Japanese) (Rosli 2006). In recent years, most of Inokom’s vehicle production has been based on existing Hyundai models such as Inokom Santa Fe (Figure 2.2), Lorimas, Atos, Getz and Matrix.

![Inokom Santa Fe](source: Roy 2010)

The fourth national car company emerged on October 18th, 1997, launched by Diversified Resources Bhd (DRB) as its new subsidiary, named Malaysian Truck and Bus Sdn. Bhd. (MTB) which produced non-national automobiles, namely Isuzu, Mitsubishi, Musso, and Tata (Rosli 2006). The market report by the Malaysian Automotive Association (MAA) showed that among the four brands, Isuzu D-Max and Mitsubishi Triton appeared in the Top 40 Vehicles list in 2007 (Chips 2008).

![Malaysian Automotive Industry](source: author's own)
2.4 The Emergence of Proton

The idea of producing the first Malaysian made car came from the fourth Malaysian Prime Minister, Tun Dr. Mahathir Mohammad. Malaysia, like most of its neighbours, began a drive towards industrial development at the beginning of the 1980s in an effort to reduce the country’s reliance on foreign-made imported products. Among the sectors targeted by Mahathir for development was that of a domestic automobile industry. Rather than creating a domestic industry from scratch, Mahathir sought to partner with an established automaker (Grant 2004). Based on the „Look East“ policy introduced in February 1982, Mahathir chose Japan to be its advisor in assisting Malaysia to fulfil its dream. This was the „Look East“ policy, which focused on Asian nations as development partners rather the west. The Mahathir government saw Japan as a highly desirable partner for speedy economic development and industrialization in Malaysia, and was particularly keen for Japanese multi nationals to invest in Malaysian technology development. One of the anticipated advantages of Japanese investment in Malaysia was the transfer of technological expertise to local workforces (Furuoka 2007).

After the first National Car Project (NCP) was approved a joint venture agreement between Heavy Industries Corporation of Malaysia Holdings Berhad (HICOM) and Mitsubishi Corporation was finalised in 1982. This agreement established a manufacturing complex in Shah Alam, a suburb of Kuala Lumpur, Malaysia’s capital, and Proton was born (Zafar & Humphreys 2008).

According to Simpson, Sykes and Abdullah (1998), the objectives of the Malaysian national car project were to: “rationalise the local automotive industry; spearhead the development of a local component industry and enhance greater use of local components; encourage the upgrading of technology, engineering knowledge and technical skills of the country workforce; assist and develop the Bumiputera’s (the indigenous people of Malaysia) participation in the automotive industry” (p.122).

Proton developed knowledge in producing cars by sending selected staff from research and development to factory production to Japan. In the initial stage, Proton began its production with the Proton Saga in 1985 (Iswalah 2002). To date, the generation of the Proton family has increased with various models such as Iswara, Wira, Putra, Tiara, Satria, Juara, Perdana, Arena, Waja, Gen 2 (Figure 2.4), Savvy, and Persona. Basically, all the models except Waja, Gen 2, Savvy, and Persona,
followed the wheel-based of Mitsubishi cars. The *Wira* and *Perdana* models are largely Mitsubishi designs, while *Tiara*, follows a Citroen design, and *Satria* and *Putra* are redesigned variants of *Wira* (Abdullah 2006). For instance, Proton *Wira* was introduced based on the Mitsubishi *Lancer*, *Colt*, while Proton *Perdana* follows Mitsubishi *Galant/Eterna* wheel-based.

Currently, Proton cars are exported globally. The first Proton car was exported in 1986 to countries including Argentina, Australia, Bahrain, Bangladesh, Belgium, Brunei Darussalam, Chile, Cyprus, Egypt, Fiji, Germany, Jordan, Kuwait, Lebanon, Libya, Maldives, Mauritius, Oman, Philippines, Qatar, the Russian Federation, Saudi Arabia, Singapore, Slovenia, Sri Lanka, Taiwan Province of China, Turkey, United Arab Emirates, and United Kingdom (Iswalah 2002).

The joint venture with its partner company, Mitsubishi Motors, has given Proton a great advantage in terms of knowledge in the automotive production and sales profit since the first *Saga* model was introduced. With rapid changes of technology in the global automotive industry, Proton expected the technology transfer pace to be fast. However, this did not happen and the Japanese car maker was slow in introducing their technological innovations to Proton. Moreover, the Malaysian government was becoming increasingly concerned at Proton’s technological dependence on Mitsubishi Motor. Hence, in order to reduce this dependence, Proton bought 80% share of the British sports car maker, Lotus, in 1996 (Fletcher & Poh 1997). The advantage of including the Lotus engineering and design technology in Proton was that it could reposition into the export market that focused on the sporty and luxury segment. Moreover, the engineering and design staff were maintained, as was their work for third-party car makers, and production of the company’s elite *Elise* sports car was continued (Grant 2004). According to Tengku Mahaleel, Chief Executive of Proton, “the brief for Lotus is ambitious: make Proton the BMW of the East. The
Waja is the first step in that direction” (Wilson 2001 p. 16). In 2000, Proton launched the Waja ("steel" in Malay). The Waja offered a sleek, racy design together with the influence of Lotus's design and engineering expertise (Grant 2004) and was the result of over three years of R&D effort and investment of close to RM1 billion. It was the first Proton model to be largely designed by local designers and engineered in-house. According to Abdullah (2006) “local manufacture of the Waja was expected to reduce the external royalties the company was paying and also greatly reduce foreign exchange losses. Savings were calculated to be in the region of RM900 million” (p. 8).

In addition to the collaboration with Mitsubishi Motors Corporation, there were other attempts at securing additional partners, for instance with French PSA Peugeot Citroen, China’s Goldstar Heavy Industrial Co., Cherry Automobile Co., Jinhua Youngman, India’s Mahindra & Mahindra, Germany’s Volkswagen AG, and General Motors Corp. Some of these joint ventures were successful but some were not. For example, for French PSA Peugeot Citroen, the joint-venture with Proton began in the early 1990’s which can be considered a failure. The Proton Tiara which was based on the Citroen AX was a flop as it was poorly conceived, lacking features and suffering mechanical problems (Tan 2008a). In this venture, France Citroen agreed to provide engines and technological assistance for new Proton models. Besides upgrading technology, the purpose of the Proton-French Citroen alliance was to free Proton from Japanese technological control (Wad 2001).

The joint-venture attempts with China automaker started with Jinhua Youngman Automobile Manufacturing Co Ltd. in which Proton Gen 2 rebranded the Europestar. A new range of ‘Made-in-China’ Europestar cars with the engineering services of Lotus was to be developed which was also called the Europestar (Lim 2007). Besides China, there were a few other multinational automaker companies Proton was interested to be in alliance with. Unfortunately these agreements did not materialize due to unforeseen circumstances. For instance, the negotiations for Proton between Khazanah and two major international car manufacturers - Volkswagen and General Motors - were called off due to changes in the National Automotive Policy on seeking a foreign strategic partner (Wan 2007).
2.5 The Protected Industry

In the early stage of automobile production, the Malaysian government implemented a „protectionist“ concept, whereby monopolistic protection was given to local car manufacturers to enable them to become more competitive and to support industries to grow. An import duty for passenger cars was introduced ranging from 140-300 percent, based on five different rate levels based on engine capacity (Automotive supplier information 2000). Table 2.2 shows the levels of import tariffs on different imported models.

<table>
<thead>
<tr>
<th>Import Duty (Passengers Cars)</th>
<th>Engine Capacity</th>
<th>Duty Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Less than 1800 cc</td>
<td>140% of CIF</td>
</tr>
<tr>
<td></td>
<td>1800 to 1999 cc</td>
<td>170% of CIF</td>
</tr>
<tr>
<td></td>
<td>2000 to 2499 cc</td>
<td>200% of CIF</td>
</tr>
<tr>
<td></td>
<td>2500 to 2999 cc</td>
<td>250% of CIF</td>
</tr>
<tr>
<td></td>
<td>3000 cc and above</td>
<td>300% of CIF</td>
</tr>
</tbody>
</table>

Import Duty-trucks for all engine 50% of CIF
Import Duty-bus for all engine 30% of CIF

Sales Tax 10% on (CIF + Import Duty)

Notes:
CIF = Cost, Insurance and Freight

Table 2.2 – Malaysian import duties on Completely Built-Up (CBU) Vehicles *Source: (Billette & Ryan 2001).

For Proton, the protection applied by the Malaysian government took the form of a preferential tax to undercut rivals and win a greater share of the domestic car market (Richardson 1995). However, the result was that Proton had no competition and therefore stayed within its comfort zone where fewer new models were introduced and the company concentrated only on cosmetic changes. Clearly, Proton and other local car manufacturers had an advantage as the excise duty was as high as 300 percent for some models. An illustration of import duty for imported cars in 2001 is given in Table 2.3. Besides the high import duty, the importer could also be charged with customs warehouse storage fees, which were charged on a daily basis.
As well as the high excise duty, foreign cars were also subject to sales tax, which further increased the price of imported cars. The high sales tax remained until 2008 when the import tariff was reviewed and reduced by the Malaysian government in accord with agreements made in the spirit of the South East Asian Nations (ASEAN) Free Trade Area (AFTA).

AFTA was established at the fourth ASEAN summit in January 1992 in Singapore. With AFTA, the national automotive markets in ASEAN countries which had been protected by high tariffs would eventually be opened to foreign competition (Abdullah 2006).

However, after AFTA was established, “Malaysia delayed the inclusion of 218 tariff lines on CBU and CKD automotive products until 2005 in order to recover the impact of the regional financial crisis of 1997. This allow them to undertake necessary restructuring exercises and prepare for the market opening under AFTA without disrupting long-term development of the industry” (Abdullah 2006 p. 6). Thus, delaying the AFTA tariff reductions increased Proton’s sales, with more local people forced to purchase Proton cars because the high excise duties on imported vehicles made them too expensive in comparison to the cheaper price of the protected Proton (Eileen 2007).

In 2010, the Malaysian government reduced the ASEAN CEPT (Common Effective Preferential Tariff) to zero percentage (Table 2.4) as a result of complaints from neighbouring countries especially Thailand. This narrowed the gap of prices between the Malaysian cars and imported cars.

Table 2.3 – On the road price for BMW 330i, 2001 *Source: (Billette & Ryan 2001)
MALAYSIAN CAR INDUSTRY

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Table 2.4 – Import duties and taxes on motor vehicles 2010 – motor cars (Including station wagons, sport cars and racing cars) *Source: (Malaysian Automotive Association 2010)

<table>
<thead>
<tr>
<th>Engine Capacity(cc)</th>
<th>CBU</th>
<th>CKD</th>
<th>MSP</th>
<th>CB &amp; CKD</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 1,800</td>
<td>30%</td>
<td>0%</td>
<td>10%</td>
<td>n.a</td>
</tr>
<tr>
<td>1,800 – 1,999</td>
<td>30%</td>
<td>0%</td>
<td>10%</td>
<td>n.a</td>
</tr>
<tr>
<td>2,000 – 2,499</td>
<td>30%</td>
<td>0%</td>
<td>10%</td>
<td>n.a</td>
</tr>
<tr>
<td>Above 2,500</td>
<td>30%</td>
<td>0%</td>
<td>10%</td>
<td>n.a</td>
</tr>
</tbody>
</table>

Notes:

MFN = Most Favoured Nation
MSP = Multi-Sourcing Parts
CEPT = Common Effective Preferential Tariff

2.6 Market share - present and future threats to Proton

Monitoring market share as a critical performance indicator is significant in the automotive industry to see how well a brand is performing. It is also an indicator of client’s acceptance towards a brand. It is measured by sales volume (the number of units sold).

For Proton, the sales volume remained stable when the Proton model was first introduced in the Malaysian market. Sales of Proton cars steadily increased from 1985 to September 1997 then diminished in October 1997 when sales fell by 70 percent due to the regional financial crisis. The stock of unsold Proton cars increased to 25,000 units. Therefore, production targets for 1998 were decreased and Proton halved its output from 250,000 to 110,000 units (National Economic Action Council of Malaysia 1998). However, by 1998 the company was slowly increasing sales to the pre October 1997 levels (Billette & Ryan 2001).

Despite the extension of the deadline for implementing the AFTA agreements from 2000 to the end of 2005 and the ongoing implementation of high import duty on Completely Built-Up (CBU) foreign vehicles, Proton again faced diminishing sales during this period. In 2003, Proton sales fell by 20 percent and market share dropped to 49 percent from 60 percent in 2002. 2004 saw Proton’s market share slip again, to 44% (Netto 2005). In 2005, although Malaysia’s overall automobile sales increased remarkably, Proton’s domestic decline continued due to intense competition. The company was also been slow in marketing itself effectively around the world (Zafar & Humphreys 2008).
The following factors can be identified in Proton’s loss of market share. In the initial stage, when the protective measures which made Proton cars cheaper than imported cars were implemented, Malaysians car users had no choice but to buy Proton. However, as sales increased, Proton did not introduce new models but kept their existing models incorporating some aesthetic alterations such as changes of the front fascia and interior trim accessories. This contributed to a general slowdown of Proton sales as consumers became bored with its old models such as Wira, Tiara, and Satria (Keay 2004). However, in early 2005, Proton started to introduce new car models such as Savvy (2005), Satria Neo (2006), Persona, (2007), Saga – new generation (2008), Exora (2009), and Inspira (2010). All new models listed used new platforms except the Satria Neo, which maintained the old Satria model wheelbase incorporating aesthetic alterations. Although Proton progressed by producing at least one new car a year, it experienced great competition from other local and international carmakers, especially Perodua. For example, in 2005 this introduction of the Proton Savvy and the Perodua Myvi (Figure 2.5) meant competition between both local companies.

![Perodua Myvi and Proton Savvy](image)

*Figure 2.5 –Perodua Myvi and Proton Savvy *Source: (Tan 2008b ; The Auto Channel 2006)

Table 2.5 shows the sales figures of the Proton Savvy and the Perodua Myvi, for 2007. Both targeted the same market segment but showed a significant difference in terms of sales. The sales of Perodua Myvi overtook Proton Savvy with a difference of a total of 78,864 units which confirmed the domination of Perodua, especially the Myvi model, as Malaysia’s number one car in 2007.
The introduction of both models targeting same market segments was a disadvantage for Proton. Malaysian consumers did not like the appearance of the \textit{Savvy}. The result also was a poor reflection on the Proton design team. However, Proton was rescued by the \textit{Persona}, which was very well received, and from a 23.6\% share in 2006, it closed with 24.2\% share in 2007 (Chips 2008).

The sales domination of Perodua cars increased from 162,141 (2007) to 166,736 (2009) (Figure 2.6). In addition, from 2009, Proton was faced with increasing threats from Japanese imports. For instance, the sales of Japanese made cars, especially Honda, increased from 1997 to 2009 (Figure 2.6). This was due to the change of automotive policy during the administration of the Malaysian Prime Minister, Tun Abdullah Ahmad Badawi, which meant that from 2004 onwards, Proton sales were squeezed by cheaper, high-quality Japanese models launched by Toyota and Honda (Wad 2009).

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|}
\hline
\textbf{Model} & \textbf{Total Units} & \textbf{Avg Units/Mth} \\
\hline
1 Perodua \textit{Myvi} & 84,706 & 7,059 \\
2 Perodua \textit{Viva} & 46,217 & 5,777 \\
3 Proton \textit{Iswara} & 43,605 & 3,634 \\
4 Toyota \textit{Avanza} & 24,102 & 2,009 \\
5 Toyota \textit{Vios} & 22,751 & 1,896 \\
6 Proton \textit{Persona} & 18,333 & 3,667 \\
7 Perodua \textit{Kancil} & 17,688 & 1,474 \\
8 Proton \textit{Wira} & 17,648 & 1,471 \\
9 Proton \textit{Waja} & 12,070 & 1,006 \\
10 Toyota \textit{Hilux} & 10,963 & 914 \\
11 Proton \textit{Gen 2} & 10,719 & 893 \\
12 Honda \textit{City} & 9,707 & 809 \\
13 Toyota \textit{Camry} & 9,523 & 784 \\
14 Honda \textit{Civic} & 9,306 & 776 \\
15 Naza \textit{Citra} & 8,349 & 696 \\
16 Perodua \textit{Kelisa} & 6,577 & 548 \\
17 Proton \textit{Satria Neo} & 6,251 & 521 \\
18 Proton \textit{Savvy} & 5,842 & 487 \\
19 Perodua \textit{Kenari} & 5,825 & 485 \\
20 Toyota \textit{Innova} & 5,808 & 484 \\
\hline
\end{tabular}
\caption{The Malaysia Top 40 in 2007. *Source: (Chips 2008)}
\end{table}
Another factor that has affected Proton in the past, and continues to do so, is the lack of styling and technology (Sidhu 2010) of Proton cars. In order for the car industry to be a major world player, styling and technology must be improved in the future. The Korean car industry has faced similar challenges, but has invested large sums of money in both the styling and technology of Korean cars in recent years (Sidhu 2010). Proton also needs to establish partnerships with more foreign companies in order to provide the latest technology transfer and latest car styling trends for the development of future product line-up. This will also automatically improve the quality of Proton cars which has been one of the factors contributing to Proton’s failure.

Ever since it was introduced in 1985, Proton has been plagued with poor quality problems especially its unreliable power windows (Netto 2005) which has undermined its impressive styling and advanced technology. Such problems have not helped Proton’s image, especially at a time when there is an increasing perception that its local rival Perodua offers better value for money (Netto 2005). Therefore, besides improving its quality, Proton needs to set exacting standards in order to do well in local and foreign markets.
In addition to these factors there is also the issue of the growing threat from the Chinese car industry, which appears as a concern for most global car brands (Kim & Krolicki 2010) and sooner or later will affect Proton in their future market share.

In the case of China, it poses a threat to the global automotive brand in general (Kim & Krolicki 2010) and to the Malaysian automotive industry in particular, especially Proton and Perodua. Earlier, Chinese made cars were known for poor quality (Sima & Maxton 2006), but with the help of foreign partners (Figure 2.7) they Chinese car industry has rapidly improved and is now prepared to challenge established international brands such as Volkswagen, General Motors and Hyundai Motor in the higher segments of the market (Kim & Krolicki 2010). Furthermore, the Chinese automotive industry is aiming to sell cars worldwide. Therefore, in a push to attract the European and American market, the Chery Automobile Corporation (CAC) has made an investment in car design by enlisting the help of world famous Italian car design studios Bertone and Pininfarina (Wattanapruttipaisan 2005). As a result, consumers are beginning to notice Chery's existence, especially in Malaysia. In 2009, Chery sold more than 2,000 cars in Malaysia, which improved its position from 19th place in terms of annual sales in 2008 to 13th place in 2009 (Aftermarketbusiness 2010). This shows that partnerships with foreign companies are beneficial not only to Chery but other Chinese car companies such as First Automobile Work, Guangzhou Automobile Industry Group, Shanghai Automotive Industry Corporation, Harbin Hafei Motor Corporation, Jinbei Automobile Corporation, Nanjing Auto, Beijing Automotive Industry Corporation, Dong Feng and Chang'an Chongqing (see Figure 2.7). Added together with knowledge and technology transfer from the foreign car companies, it is not impossible that some of these domestic Chinese brands could compete with global brands both at home and overseas. History shows that in the 1960s, Japanese cars including Datsun and the Toyota, won strategic positions in the American market within a comparatively short time (Baker 2007) and today these cars are all considered as quality brands. These figures also reflect the instincts and attitudes of Chinese manufacturers that they have the capability to become a major player in the world car market.
If Proton managed their weaknesses and developed strategies to deal with possible threats from other international companies, especially from Japan and China, this could help them to become more focused in developing their product and brand identity, thus leading them to domination of the local market share as well as success in the global market.

### 2.7 Summary

This chapter discussed the early development of the Malaysian automotive industry, the protectionist measures imposed by the Malaysian government to assist the local car industry, and factors that caused Proton's decline and loss of market share were discussed. The current Malaysian car sales and market share were explained, and the potential threats from the Japanese and Chinese automotive industries. Although currently the market share is dominated by local product, the growing threats from the Japanese and Chinese car industries are apparent.
3 LITERATURE REVIEW

3.1 Introduction

This chapter covers four areas 1) methods used by automotive companies in market research, 2) perception study in design, 3) product personality and self image, and 4) cross-cultural study.

As the present research concerns people’s perceptions towards cars, this chapter presents a review of existing research on perception, including research by automotive companies and academic researchers in affective design. An understanding of the techniques used by both groups should provide knowledge of the advantages and disadvantages of existing methods for investigating perception studies.

3.2 Methods Used By Automotive Companies to Conduct Market Research

Market research is fundamentally a systematic and objective process of generating information about consumer behaviour (Zikmund 2003). Its purpose is to generate links between the consumer and the marketer, to provide information useful for making marketing decisions (Burns & Bush 2008). It is also a means of implementing marketing concepts, which are considered to be the most central idea in marketing thinking, to an organisation (Zikmund 2003). Furthermore, it is used to identify and define marketing opportunities and problems; to generate, refine, and evaluate marketing actions; to monitor marketing performance and to improve the understanding of the marketing process (Kotler et al. 2003). Therefore, market research is interrelated with various areas or departments such as sales, product development, and costing, as data gathered through market research helps marketing managers to position future products based on market segmentation, and make decision on the types of concept to be used for product appearance. Figure 3.1 shows the basic role of marketing research in an organisation that interlinks to
four different areas for the purpose of data gathering, recording, and analysis of issues that relate to marketing products and services. This is to provide a clear picture of the effective role of marketing research in product success.

Market research can involve both: qualitative and quantitative methods. According to Fossey et al. (2002) a qualitative method “aims to address questions concerning the meaning and experience of human lives and social works” (Fossey et al. 2002 p. 717). Qualitative methods emphasize language (Malhotra 2006) and focus on smaller rather than large samples. These types of methods are being increasingly applied in design to understand consumers’ feelings and perceptions of products. For instance, Henry Dreyfuss, the well-known American industrial designer, conducted ethnographic research while developing products. He suggested that studying people in the environments in which they eat, work, sleep, and play is an integral part of the design process and the most effective way to design useful, pleasing, and profitable products (Rothstein 1999). Thus, ethnography as well as focus groups and participatory research are qualitative methods commonly used in qualitative approaches in order to gain insight into products. These three methods support marketers and designers in achieving their tasks in increasing sales and producing useful products. In the automotive industry, qualitative methods are
Ethnography is “a research approach that produces detailed, in-depth observations of people’s behaviours, beliefs, and preferences by observing and interacting with them in a natural environment” (Ireland 2003 p. 26). It includes field ethnography, digital ethnography, photo ethnography, etnofuturism, real world ethnographic enactments, and personas (Ireland 2003). “Ethnography differs from traditional market research techniques by focusing on elements of culture and context, with objectives that usually require a broader approach than collecting data from fully specified interview protocols or survey instruments” (Rosenthal & Capper 2006 p. 218).

Toyota applied ethnography as one of their qualitative research methods for producing cars that suit consumers” needs. The ideology for using ethnography is based on one of Toyota’s principles as laid down in 1935 by the original company founder, Sakichi Toyoda, „Genchi Genbutsu”, which means „Go and see for yourself”. Ethnography was used during the early development of the Lexus model when teams of technicians were sent out from Japan to survey parking lots of upscale restaurants, garages, and neighbourhoods to understand how valets parked cars. They found that there was a very strict pecking order in terms the types of cars so that more expensive cars were parked to be much more easily accessible. The pecking order was mostly influenced by car appearance, the brand, and the image. This can be considered as one of Toyota's ways to discover a detailed sense of how people assess a car in relation to the look, brand, and image (Dawson & Patrick 2005).

Ford, like Toyota, has considered a number of methods including two ethnographic methods to understand customer needs and wants. The first ethnographic method used a special suit called the „Third Age Suit”. This suit was given to Ford’s car designers and engineers as a way of letting them experience personally how a car handled and was perceived by its intended target group, the over 55 years age group. The suit restricted the physical agility of the driver by using materials that added bulk and restricted movement in key areas such as knees, elbows, torso and back. Gloves that reduced the sense of touch and goggles that stimulated impaired vision were also utilised (Gover 2005).
A similar method was applied by the Japanese car maker Nissan Motor, whereby a special “Aging Suit” and goggles were worn by young designers to simulate the bad balance, stiff joints, weaker eyesight, and extra five kilograms (11bs) that may accompany senior citizens (Sloan 2008).

The second ethnography method applied by Ford was the focus group. The focus group approach involved market researchers attending customer immersion events and spending time with customers in their homes. This enabled the market researchers to gain an understanding of how customers used their vehicles and allowed them to better meet these needs before the vehicles were available for purchase (Spencer 2006). The development of the Ford Taurus involved a similar approach. Two to three hour meetings were arranged with consumers who owned new full-sized sedans to talk about what they liked about their cars (Hammonds 2009). The data collected gave designers new ideas and guidelines to develop future models of the Taurus that would better meet customer needs.

In understanding consumer needs of a product, ethnographic methods have not only been applied to automotive products like cars but also by well known motorcycle companies such as the well known American motorcycle company Harley Davidson. Harley Davidson applied an ethnographic method to assist designers in developing existing and new product lines. The method was effective in increasing sales. “Between 1991 and 2002, the US heavyweight motorcycle market grew at a compound rate of approximately 15% per annum. Within this market Harley Davidson had a market share of 48% by 2002” (Frigo 2004 p. 2).

The method mostly focused on the Harley Owners Group (HOG) to discover the concept of the subculture of consumption (Schembri 2008 ; Schouten & McAlexander 1995). Subculture of consumption can be defined as distinct, homogenous groups of people united by a common commitment to a particular set of consumption items or activities (Schouten & McAlexander 1993). Other attributes of a subculture of consumption include “an identifiable, hierarchical social structure, a unique ethos; or a set of shared beliefs, values, unique jargons, rituals, and modes of symbolic expression” (Schouten & McAlexander 1995 p. 43).

In order to get the feel of the biker’s lifestyle, more than three years” ethnographic work was conducted primarily from within a chapter of the HOG. This included participant observation, interviews, and visual documentation of the Harley
As outlined in Figure 3.2 the process involved researchers being upgraded from a state of non-participant observation to part-time participant observation and finally a state referred to as full-time ethnography over an approximate three year period. At the earlier stage of being novice participants, researchers would have their own bikes, not Harley Davidson, and ride regularly with the bikers. Gradually they became active members who owned Harley Davidsions as their primary mode of transport (Schouten & McAlexander 1995).
As a whole this ethnographic research expanded the researchers’ knowledge and allowed them to gain an in-depth understanding on the lifestyle of the HOG members. Researchers explored the social structure of a subculture of consumption and revealed a hierarchical structure based on status, the source of which was one’s commitment to the subculture’s ideology as manifested in patterns of consumption (Schouten & McAlexander 1995). This action was labelled by the researchers as “consumer initiated new-product development” (Schouten & McAlexander 1993). It created the opportunity for Harley Davidson designers to develop an extensive product line and design through expropriating certain symbols of the outlaw subculture (Schouten & McAlexander 1995).

Ethnographic research can be carried out not only in a real life environment but also in the form of a computer-based simulated environment or Virtual World, where users can create objects and communicate to one another by using avatars as their virtual representations (Chesney, Chuah & Hoffmann 2007). According to Godfrey (2008), avatars are often a 3D version of a character that may be a humanoid or an animal. These characters are used to interact with the world around them and with other users. Virtual worlds can be reality based, fantasy based or a mix of the two. They may be games, have gaming elements or may be solely social environments.

According to Bainbridge (2007), “the diversity of current virtual worlds can be represented by the creativity oriented environment Second Life (SL)” (Bainbridge 2007 p. 472). SL is a 3D virtual world developed by Philip Rosedale (Rymaszewski et al. 2007) at Linden Lab, a San Francisco based corporation. It is defined by its creators as “an online society within a 3D virtual world entirely built and owned by its residents, where they can explore, build, socialize and participate in their own economy” (Atkinson 2008 p. 18). For market research purposes, “SL is designed to mount formal experiments in social psychology or cognitive science in which the researcher can construct a facility comparable to a real-world laboratory and recruit potentially thousands of research subjects, over a period of months and at a low cost” (Bainbridge 2007 p. 472). SL is also said to be suitable for conducting ethnographic research to gain insights to virtual communities (Bainbridge 2007 ; Catterall & Maclaran 2002).

Companies such as DaimlerChrysler use SL as a platform to communicate with their target audience who may be difficult to reach through traditional media outlets. It can also be considered as an outlet for experiential marketing by providing
customers with opportunities to interact with their brands (Moon 2007). DaimlerChrysler opened Mercedes Benz Island in February 2007 using the SL system with a celebration party as well as a concert. A month later the new model of the Mercedes C-Class was introduced, which allowed buyers to customize the colour, wheels, and license plate (Reisberger, Reisberger & Strahringer 2008). DaimlerChrysler researchers and designers should be able to use this information on consumer preferences for these design elements for future Mercedes Benz designs.

General Motor Pontiac Division also used the SL system and invested thousands of dollars in creating a make believe Pontiac model and Motorati Island (Dapena 2006). On Motorati Island showrooms displayed Pontiac cars and users were able to test drive Pontiacs on a high performance track (Willis 2007). Toyota followed in Pontiac’s footsteps and unveiled a SL version of the Toyota Scion xB and xD models in 2007 (Jones 2007). In contrast to Pontiac, Toyota created a 3D virtual life city called “Scion City” to allow consumers for test drive their vehicles (Moon 2007), similar to a computer game such as Grand Theft Auto. The test drive involved users accessing a radial menu in order to board the car, with driving controlled by using arrows on the keyboard. Another Japanese automotive company, Nissan has also ventured into SL to promote their Sentra models. Consumers can test drive the vehicles by using a radial menu and keyboard in order to board and drive the car respectively and change the exterior and interior styling of the car as at Nissan Island (Dapena 2006). As for Peugeot, their involvement in SL started in 2010 when the SL user could visit Peugeot Island and was allowed to test drive the Peugeot 308 RCZ on a virtual race track that was innovatively and stylistically composed (Kurczewski 2010).

By using SL as a basis for promoting their products and understanding their consumers’ needs, these companies integrated a number of elements of the most popular form of new media (Siklos 2006). It gave them an easy access to communicate with existing and potential consumers. As such, researchers could act as a resident and communicate with consumers/residents with informative online interaction being established. Moreover, from the total sales of cars in SL, the company can predict whether certain car models would fulfil customer needs if it were to sell them in real life.
Another qualitative method applied by automotive companies for their products is “listening-in”. “Listening-in“ is a process to gather consumer feedback on the product appearance and performance. It makes the firm, researcher and designer aware of the weaknesses of a product and provides solutions to improve it. With the advancement of Information Technology, more sophisticated ways to listen to consumers’ physical voices have been invented. By using websites, listening posts have been created and ongoing dialogues between customers and Web-based advisers have been monitored (Urban & Hauser 2004). The ongoing dialogues are created when consumers search automotive websites for information and advice about automotive purchases. For instance, in the development of the Scion models, Toyota designed a website in which a “listening post” was incorporated to identify customer feedback and suggestions. The ongoing dialogues between consumers and Web-based advisers were monitored closely (Cina 2002). Data gathered as shared with marketing and product development divisions in order to make improvements on existing and future products.

As the usual method of developing products is through communicating with consumers and identifying their product preferences, there is another method which involves the participation of consumer during the product development stage. This qualitative method is called “participatory” and establishes direct communication between consumers and designers, including during the product development process. In this method, feedback from the consumers can be obtained on the spot during the early stage of product development. The participatory method helps designers to empathize with the prospective users of the product and to understand the functional, personal, and social contexts in which the product operates (Forlizzi & Ford 2000).

Volvo is one of the companies that has adopted the participatory method. The design development process of the Sport Utility Vehicle (SUV) called the XC90 can be identified as the first step Volvo took towards customer involvement. Meetings were conducted with customers at different stages of the process. The main objective of the meetings was to elicit opinions and expectations regarding SUVs and to feed the concept development phase of the project. During these meetings, customers were presented with full-scale plastic models and their opinions were noted. Eventually the customers were given a chance to drive the final version of
the XC90, which can be recognized as the result of their personal ideas (Dahlsten 2004).

The development of the Toyota Sportivo Coupe is another example of the participatory method being used by a car company. Groups of teenagers in Melbourne and Sydney attended market research clinics to provide the designers with an insight into the key influences in their lives (Autoweb 2004b). The final exterior design was penned by 29 year old Nick Hogios, the inaugural winner of Wheel magazine’s Young Designer of the Year award in 1999 based on the concept selected by the teenagers (Autoweb 2004a).

Story gathering or telling is another method with growing popularity in qualitative research which is being applied by corporations. It was found to be an effective way for marketers to understand consumers’ perceptions and experiences on the products and images of a corporation. By the consumers telling their own stories about the company or the product, the communication channel became broader and companies are able to display and market themselves in more ways than before (Hermansson & Na 2008). A number of companies have started to harvest stories from customers to use in advertising and promotion (McLellan 2006). For example, Coca-cola built a storytelling theatre showing a range of their ads as well as true stories about Coca-cola from customers around the world. Guests were also invited to tell their story in a small studio set up that recorded people telling their stories about their own Coca-Cola memories which provided potential additional stories for the theatre (McLellan 2006).

In the automotive industry storytelling is being applied in different ways. For instance, a campaign by Mercedes Benz in 2004 used storytelling through advertisement by featuring short clips of people with compelling stories about their cars (Warner 2004). Besides the intention of promoting the product, storytelling in this context acted as a data provider for marketers or designers in understanding the consumer experience towards the product. This provided them with ideas of new concepts.

Quantitative research focuses on methods for gathering data that are different to qualitative methods. The focus of quantitative research is the testing of ideas and concepts, the project ability of results (Kim 2003) and delivering information in the form of numbers (Clary 2008). This method allows market researchers to
understand the current trend and position of the product according to the market segmentation. In the automotive industry, quantitative research is widely applied in the form of questionnaire surveys on consumer satisfaction in the context of quality and services. Big companies like J. D. Power and Associates, TNS Automotive, and RDA Group are usually paid to run the surveys (Ford Motor Company 2010; Kiley 2007; Savage 2005).

Another type of quantitative research used by the automotive industry is brain imaging. Brain imaging is a branch of neuroscience study that identifies consumer perceptions towards products. The application of neuroscience into marketing started when ex-President George Bush Snr issued „Proclamation 6158” which declared the years 1990 to 2000 be called the „Decade of the Brain” (Bush 1990; Senior et al. 2007). The research mandated that all the US federal biomedical institutions worldwide were directed towards the study of the brain in general and cognitive neuroscience specifically (Senior et al. 2007). The power of neuroscience has attracted the attention of advertising and marketing researchers eager to apply the principles and techniques of neuroscience to further their pursuits. The appreciation of the field among advertisers has led to the emergence of a new field within advertising often referred to as „neuromarketing” (Marci 2008). According to Moore (2005), another objective of marketers conducting neuromarketing research is to locate consumers „buy buttons”, the way to get closer to opening the „black box” of the consumer’s mind.

The introduction of „neuromarketing” or „consumer neuroscience” as a technique inevitably assists marketers to better understand consumers reactions to brands and advertising (Wilkinson 2005). Neuromarketing employs methods from neuroscience in order to enhance the understanding of consumer behaviour (Kenning & Plassmann 2008) that may have an important influence on people’s decision-making (Stoll, Baecke & Kenning 2008).

Lee, Broderick, and Chamberlain (2007) defined „neuromarketing” as “a field of study that can simply be defined as the application of neuroscientific methods to analyze and understand human behaviour in relation to markets and marketing exchanges” (p. 200). Moore (2005) defined „neuromarketing” as “the application of the techniques of neuroscience to marketing stimuli; in layman’s term, to see how the brain „lights up” when exposed to the marketing efforts” (p. 12). The definition given by Lee, Broderick, and Chamberlain (2007) widens the scope of
neuromarketing research from solely consumer behaviour to include study such as inter and intra-organisational research. Moore’s (2005), definition indirectly stresses consumer behaviour where the phrase “lights up” reflects on consumers” reactions as a way to represent consumers” behaviour. Both definitions have the same purpose; they consider consumer behaviour as the centre of the objective, different to earlier definitions which described neuromarketing as “applying the methods of the neurology lab to the questions of the advertising world” (Thompson 2003 p. 2).

The tools that are used in neuromarketing research are based on existing neuroscientific methods (Stoll, Baecke & Kenning 2008) that relate closely to brain-imaging technology such as Magnetoencephalography (MEG) (Ambler & Burne 1999 ; Kenning & Plassmann 2008), Functional Magnetic Resonance Imaging (FMRI) (Kenning & Plassmann 2008 ; McClure, Li & Montague 2004), Electroencephalography (EEG) (Fugate 2007), Positron Emission Tomography (PET), and Magnetic Resonance Imaging (MRI) (Coutu 2004). The brain-imaging technology is used to track the way consumers respond to everything from brands and products, to movie trailers, web advertising and even political campaigns. This technology is proven to be expensive, as one scan typically costs between $3,000 and $4,000 per person, which limits most companies” ability to test large numbers of subjects (Medina 2008).

DaimlerChrysler used brain imaging to understand consumers perception towards their car choice (Anjana 2006). The brain imaging was conducted at DaimlerChrysler Research Centre in Germany, a centre that has been at the forefront of neuromarketing, funding several research projects in the psychiatry and diagnostic radiology departments at the University of Ulm in Germany (Erk et al. 2002). Two FMRI (Functional Magnetic Resonance Imaging) tests were carried out in 2002 to examine the way consumers think which lead to making sales messages more effectively.

In the first test, images of a series of automobiles, including Mini Coopers and Ferraris were used to study the brains of consumers. It was found that as the subjects gazed at a slide of a Mini Cooper, a discrete region in the back area of the brain that responds to faces came alive. Above and beyond the car’s “wide bulldog stance, ultra-rigid body, 1.6-valve alloy engine, and 6 airbags with side protection the Mini Cooper registered in subjects” brain as adorable face” (Lindstrom 2008 p. 31). The FMRI had just pinpointed the essence of the Mini Cooper’s appeal.
In the second test, 12 healthy male subjects were studied with FMRI while viewing 66 photographs of different car classes followed by an “attractivity” rating. It was found that behaviourally sports cars were rated significantly more attractive than limousines and small cars (Erk et al. 2002). The findings revealed that the specific brain areas associated with “rewards and reinforcement” were more active for sports cars than for sedans and small cars (Britt 2004). Moreover, “sports car images also triggered increased responses in the right fusiform gyrus, an area which deals with face recognition, meaning that sports cars have more of an anthropomorphic identity than other types of vehicles” (Fugate 2007 p. 388).

Honda Motor scientists also conducted brain imaging tests. By studying the way the brain reacts to different imagery they found that motorcycles resemble a human face and in particular that diagonal headlights evoked an angry human face. This research suggests that when respondents were stimulated with a more lifelike front facial design of a motorcycle the response was similar to that when a human face is seen (Harris 2008).

Hyundai, a Korean manufacturer, also conducted brain imaging tests to understand what consumers thought about their cars before manufacturing them. In a particular study participants were shown a silver test model of a 2011 Hyundai sports vehicle. Participants included 15 men and 15 women who were asked to stare at specific parts of the vehicle, including the bumper, windshields and tires (Burkitt 2009). The results of the brain activity will give an idea for designers to improve the exterior design to suit the consumer needs.

Based on a review of the existing automotive market research, it was found that automotive researchers are more inclined to use qualitative research methods, with information gathered based on activities such as observation and one to one meetings with consumers. Furthermore, it was also discovered that the approach is only looking at car per se and does not look at the person associated with the car. This same approach is being used in academic research, which only considers cars as stimuli. For instance, Desmet et al. (2000) measured the emotions elicited by certain car models. In investigating the structure of the relationship between product shapes and affective responses, Kun-An et al. (2006) used cars as stimuli in three separate semantic differential surveys. However, cars are believed to be products that are consumed partly for the purpose of status and social identity, and therefore it is worthwhile to search for methods that judge the product together with the
owner. Moreover, as status and social identity are related to human personality, it is significant to discover how both elements match the personality display in cars. Therefore, including personality psychology in this research will strengthen the study findings. Having the right combination of methods and techniques will benefit this research as it will assist the researcher in investigating the effect that a car has upon how people perceive its owner.

3.3 Perception Study in Design
3.3.1 Design and Emotion

As this research is related to the study of perception towards Proton cars, it is important to understand the principles of the psychological relationship between consumers and their products.

This can be done by understanding the types of emotions evoked by a particular product. It is beneficial for designers to use this information as a guideline in producing designs that can be tailored towards consumer’s feelings. Desmet (2002) attempted to clarify the relationship between the product appearance and the emotional responses invoked by products. In his research the basic model of product emotions was developed, which included two tools to support designers; the Product Emotion Measurement instruments (PrEmo) and the product and emotion navigator. Desmet, Porcelijn, and Van Dijk (2007) extended the study of product emotions by discovering new types of emotions that constituted a “wow-experience”. Moreover, according to Desmet, Porcelijn, and Van Dijk (2007), „wow” is considered to be an affective experience that includes an unpleasant or a pleasant feeling that “represents a composite of several pleasant emotions: pleasant surprise, desire, and fascination” (p. 143).

“Emotional Design” is a concept developed by Norman (2004) that explained the three levels of affective processing; visceral, behavioural and reflective on how products are being judged by consumers. The concept provides valuable tools for designers in producing „emotionally innovative” designs. Research by Khalid (2006) focused on summarizing human factor issues in affective design. Khalid incorporated Norman’s concept of emotional design in her framework which was called the affective user-designer model. In this model the emotional design concept was placed in the designer environment section. This was considered useful for designers to develop products with characteristics that would evoke positive
emotional responses. Moreover, a product designer needs to consider and if possible predict the user’s needs and reactions to all three aspects of the emotional design concept (Khalid 2006).

Various types of methods, tools and techniques are used by researchers in order to investigate the types of emotions evoked by products. Antikainen (2003), developed a flexible, visually-based on-line package, based on free sorting, and multi-dimensional scaling, to help designers conduct research on users’ emotional and social responses to designed objects. In other research, Chen et al. (2003) used the combination between image morphing and perceptual mapping techniques to develop a framework for investigating the relationship between product shapes and affective responses.

The Product Emotion Measurement instrument (PrEmo) developed by Desmet (2002) was created based on existing emotion measurement instruments, ranging from simple pen-and-paper rating scales to hi-tech equipment that measured brain waves or eye movements. Its latest version, the PrEmo 6, is a software based instrument which is an interface of a product with a set of animated cartoon puppets that portrays blank expression faces presented on a monitor. This non verbal, self reporting method has often been used with other products as stimuli, for example office chairs (Reijneveld et al. 2003), cars (Desmet, Hekkert & Jacobs 2000), wheelchairs (Desmet & Dijkhuis 2003), mobile phones, (Desmet, Porcelijn & Van Dijk 2007), and chairs (Desmet 2002). McDonagh et al. (2002) described the product personality profile as a new technique for researchers/designers and discussed it alongside other emerging approaches such as mood boards and visual product evaluation. According to McDonagh et al. (2002), variations of the product personality profiling technique are currently employed by manufacturers such as Kenwood and Morphy Richards not only to identify users perceptions of typical purchasers of products, but also help to reveal social value systems and emotional responses to products.

Kansei Engineering, is one such profiling technique. Kansei Engineering ia a process of developing a product based on the consumer’s feelings for a potential product (Hsin-Hsi, Yang-Cheng & Chung-Hsing 2005). Kansei Engineering has developed its own concepts, methods and tools for “translating customer’s feelings into concrete product parameters and provide support for future product design” (Schutte et al. 2004 p. 214 ).
Research by Van Lottum et al. (2006) explored the importance of emotion in consumer preference in the field of footwear. In this study, Kansei Engineering incorporated a number of stages including:

- Collection of emotive words relating to a product sample,
- Collection of product design characteristics
- Asking prospective customers to rate a selected sample of products via a questionnaire in regards to the emotive words
- Analysis of data via multivariate analysis and modelling
- Formation of a design strategy to recommend the correct design characteristics to satisfy specific chosen emotions and/or target groups.

“Emotions” consisting of specific feelings, moods, and evaluations need to be included in research relating to automotive design. By knowing the emotional responses evoked by a car, designers will be better equipped to shape the car that matches the consumer’s emotional needs. Moreover, emotional responses can induce customers to pick a particular vehicle out of a row, and might therefore have a considerable influence on their purchase decisions (Van Lottum, Pearce & Coleman 2006).

### 3.3.2 Semantic Differential

In this research, the application of the visual analysis method is considered significant to the study of perception as it gives an idea of the physical look of a car. There is several research methods used in assessing other products besides cars using visual analysis.

For instance, Parekh and Kanekar (1994) employed photographs of young female models which were shown to female graduate students in India. The students were then asked to indicate the quality of four consumer products that a particular model was likely to choose. Product quality was rated higher for the attractive model than for the less attractive model, but the difference was significant only for beauty products. Product quality was rated higher for the elegantly dressed model than for the model who was not elegantly dressed, irrespective of product type. Research conducted by McDonagh, Bruseberg, and Haslam (2002) discussed an industrial designer's approach to eliciting user perceptions and emotional responses to products through visual evaluation and stimuli. Subsequently, this research by

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McDonagh, Bruseber, and Haslam (2002) presented product personality profiling as a new technique for design researchers/designers and discussed it alongside other emerging approaches such as mood boards and visual product evaluation. These approaches can be considered as visual analysis methods that involve respondents making judgments based on provided photographs of products.

Besides using product personality profiling as a supportive technique for visual analysis method, there is another method that is also used by researcher to support the visual analysis method in understanding product perception that is termed the Semantic Differential technique.

In previous studies, a number of researchers have used visual analysis as their method and incorporated „Semantic Differential” techniques in their research in order to measure human opinion. For instance, Shang, Ming, and Chien (2000) employed „Semantic Differential” technique to understand user perception towards product form, in this case is a telephone.

Semantic Differential is a technique used for measuring meaning through combining associational and scaling procedures. It was first developed by Osgood et al. (1957) and has its origins in research on synesthesia which is defined as “a phenomenon characterizing the experiences of certain individuals, in which certain sensation belonging to one sense or mode attach to certain sensations of another group and appear regularly whenever a stimulus of the latter type occurs” (Warren 1934 p. 270). Semantic Differential is an instrument that gives a respondent enough structure so that his or her self description will be comparable to those of other respondents (Carter, Ruggels & Chaffee 1968). The instrument is constructed using bipolar adjectives scales, that is, an adjective and its antonym, which should be as representative as possible of all the connotations of the concept under examination (Shields 2007). Subsequently, Semantic Differential is assumed to represent a straight line function that passes through the origin of space, and a sample of such scales then represents a multidimensional space. The larger or more representative the sample, the better defined is the space as a whole (Snider & Osgood 1969).

There have been numerous factor analytic studies of Semantic Differential scales, and these generally lead to the conclusion that there are typically three to five major factors of connotative meaning involved. According to DeSarbo and Harshman (1985):
The most frequently found factor is evaluation defined by such adjectives as: honest-dishonest; positive-negative; liked-disliked. Evaluation is by far the strongest factor in Semantic Differential scales, possibly because nearly all adjectives inherently imply negative or positive characteristics. The second strongest factor that often appears is potency, defined by such adjectives as: Hard-Soft; Heavy-Light; Large-Small; Masculine-Feminine; Strong-Weak. Finally, the third strongest factor that frequently appears is activity, defined by such adjectives as: Active-Passive; Fast-Slow; Hot-Cold; Sharp-Dull (p. 24).

In a cross-cultural context, Semantic Differential has proved a particularly valuable way to examine opinions in different countries, providing the bipolar adjectives chosen can be directly translated into the relevant language. Because bipolar adjectives are short words and are easy to use, they translate well into other languages (Shields 2007). As early as the 1960s, a number of studies were carried out concerning cross-cultural studies relating to the Semantic Differential technique. Research undertaken by (Tanaka & Osgood 1965) used this technique to study affective meaning systems. In this study, perceptual signs were used and the generality of the affective meaning systems was tested across three subject groups having a different linguistic and cultural bases; Americans, Finns, and Japanese. In other research Lorimor and Dunn (1967) measured cross-cultural advertising effectiveness using the Semantic Differential technique with French and Egyptian respondents. One hundred advertisements of twenty variations of each of five successful US magazine advertisements were shown to 200 middle and upper class subjects in Paris and 200 middle and upper class subjects in Cairo by portfolio tests. Studies by Osgood and his associates (1964) explored ways of tapping pan-cultural dimensions to meaning through the Semantic Differential. Following this, the application of Semantic Differential techniques on cross-cultural studies was extended by Moreland and Williams (1969). They explored the effectiveness of the evaluative factor of the Semantic Differential in the cross-cultural comparison of racial and ethnic attitudes which measured the attitudes of five groupings in four societies: American Caucasian and African American, Asiatic Indian, German Caucasian, and Hong Kong Chinese.

Semantic Differential has also been applied in other contexts. In marketing and advertising, researchers have employed related techniques in order to have an in-
depth understanding of consumer behaviour. For instance, research by Wheatley (1971) used this technique for a study to assess the effectiveness of television (TV) commercials by using two commercials which had not been shown previously on TV, one for a food product, the other for a carbonated beverage. Another research by Eastlack Jr (1964) modified the Semantic Differential technique to determine factors in consumer flavour preference to be used in product design in the food industry.

As for the application of Semantic Differential in the automotive context, few studies have been done in this area. Malhotra (1981) used Semantic Differential to measure self-concept, person-concept, and product concepts of nine brands of automobiles that were thought to be well known to the student respondents because of a distinct image. Research by Steg et al (2001) employed the Semantic Differential method for evaluating attractive and unattractive aspects of car use. In other research, a similar method called the semantic environment description method has been specifically developed for architecture and car interior analysis (Karlsson, Aronsson & Svensson 2003).

### 3.3.3 Brain Imaging

At present, with the advancement of new technology, modern sophisticated tools have been introduced in order to understand users’ product perception under the category of consumer behaviour. The technologies that have been developed to “localize complex mental activity such as memory, will, fantasy, intelligence or spatial qualities such as appreciation of shape” (Raichle 2003 p. 3960) include positron emission tomography (PET) (Raichle & Mintun 2006) which measures the brain’s chemical activity (Hotz 2005) and functional magnetic resonance imaging (FMRI) (Raichle & Mintun 2006) which measures blood flow around working neurons (Hotz 2005). Both techniques presented researchers with “an unprecedented opportunity to examine the neurobiological correlates of human behaviour” (Raichle & Mintun 2006 p. 450).

Previous studies have confirmed that the connection between consumer inner feelings and products can be made through verbal interaction with consumers using focus group interviews, observation by researchers or designers, participatory techniques with consumers’ participation, and paper or electronic based surveys using a demographic equation to target audiences. With the technology revolution,
consumer behaviour studies have reached a level whereby interaction with the consumers’ mind can be established without having them involved in traditional methods of marketing research. This could produce remarkable results in understanding consumer behaviour compared to the traditional research methods, the finding of which some have argued do not always reflect actual buying patterns (Blakeslee 2004). This neuroscientific approach (Schaefer & Rotte 2007) is a method that could allow companies to see more quickly and accurately what their customers want, like, and feel. It uses “clinical information about brain functions and mechanisms to help explain what is happening inside the ‘black box’ so prevalent in many explanations of consumer behaviour” (Fugate 2007 p. 385). Using this approach could give researchers deeper access to consumers’ minds and might be able to explain market or consumer behaviour without relying on the basis of inference rule. Understanding consumers’ subconscious thoughts, feelings, and desires that drive purchasing decisions (Lindstrom 2008) would be useful data for companies. At present, neuroimaging is often conducted by researchers in order to understand the link between the mind and the brain, to decode what an individual is thinking from their brain activity (Haynes & Rees 2006). Marketing expert Lindstrom (2008) believes that unconscious minds are much better at interpreting our behaviour than conscious minds and this has encouraged more study in understanding brain activity.

Among the neuroimaging tools that have been introduced by scientists to study brain activation, Functional Magnetic Resonance Imaging (FMRI) is currently the most widely used and is considered to be the cutting edge of technology in this field (Malach et al. 2005). This tool is believed to be a safe, non-invasive technique that records and measure brain activity associated with perception, cognition, and behaviour (Lindstrom 2008). In studies relating to brain responses to sensory simulation, the usual approach for using FMRI is to employ static, simplified, and highly controlled stimuli in which the subjects are requested to constantly maintain a visual fixation. Another approach termed “reverse correlation in which some areas of the brain were allowed to select the optimal stimuli that relates to these areas. This is considered a unique method in studying brain activation that used natural stimuli and also for testing the quality of natural marketing stimuli through brain responses” (Malach et al. 2005 p. 1).
In marketing, research using neuroimaging as a tool in understanding the physiological or biological processes involved in human decisions and actions is beginning to be considered important. Previously neuroimaging was used solely for medical research, however in the late 1990 it began to be used for market research purposes (Conejo et al. 2007). Conejo et al. (2007) added that “researchers at Harvard University developed this new approach in order to improve the effectiveness of ads. The rationale for this was based on estimates made by neuroscientists, who indicated that as much as 95% of brain activity could be subconscious” (p. 73). As most of the explanations of consumer behaviour are based on inference (Fugate 2007), neuroimaging was expected to locate the consumer’s buy buttons. It was believed that all four components of the „marketing mix“, product, price, place, and promotion, as perceived by consumers, could present potentially interesting perspectives from which to study functional neural architectures (Perrachione & Perrachione 2008). Using neuroimaging in marketing research could give a better understanding to neuro marketers, especially in studying brain activity when dealing with marketing stimuli.

In the area of logo/brand selection, neuroimaging techniques have been utilised to identify some of the cognitive and effective responses elicited by brands (Conejo et al. 2007). For example, McClure, Li, and Montague (2004) carried out behavioural taste tests using FMRI techniques in which two conditions were examined:

- Anonymous delivery of Coke and Pepsi and;
- Brand-cued delivery of Coke and Pepsi.

For the anonymous task a consistent neural response in the ventromedial prefrontal cortex that correlated subjects behavioural preferences for these beverages was reported, while in the brand-cued experiment, brand knowledge for one of the drinks had a dramatic influence on expressed behavioural preferences and on the measured brain responses (McClure, Li & Montague 2004). The researchers found that “more exposure to Coke, a better memory of Coke and more emotional ties to Coke produced a brand recognition/operative preference for Coke which overwhelmed the actual taste preference for or reward provided by Pepsi” (Fugate 2007 p. 388). According to Lindstrom (2008), these results are due to our brains encoding things of value based on emotions. A brand that engages us emotionally
will win every single time. This research suggests that brand and image development is probably just as important as product development (Fugate 2007).

In terms of product appeal the neuroimaging technique has been used in order to understand which product design is most appealing to the target market. As mentioned earlier in this chapter, a joint venture by Daimler Chrysler and Hyundai ventured into neuroimaging devices in the earlier stages of new car development. They used this technique to understand how a new car model was being perceived before manufacturing thousands of units of the car. Besides automotive design, neuroimaging tests have also been applied to assess the exterior design of packaging. For instance, the design of a potato chip packet was tested by PepsiCo Frito-Lay. It was discovered that a matte beige packet picturing potatoes and other healthy ingredients in the snack did not trigger activity in the anterior cingulated cortex, an area of the brain associated with feelings of guilt, as much as shiny bags with pictures of chips. PepsiCo Frito-Lay later switched from shiny packaging to a matte beige version (Burkitt 2009).

At present, neuroimaging techniques claim to have an advantage in research into consumer behaviour and appear to override the method problems of former traditional approaches (Yoon et al. 2006). It is believed that this technique can successfully read the consumer’s subconscious mind. As noted by Conejo et al. (2007), each consumer’s subconscious is uniquely a product of particular genetic endowment, life experiences, and thought processes, probably making it more unique than the conscious mind. In addition, research is increasingly demonstrating that identical stimuli produce dissimilar brain activity among subjects (Conejo et al. 2007; Mahoney 2005). Neuromarketers are starting to realize this shortcoming. This means, “if reactions to stimuli are so varied and cannot be generalized across a market, then the usefulness of neuroimaging is questionable” (Conejo et al. 2007 p. 74). Also, neuroimaging techniques are usually conducted in controlled laboratory conditions, which limit the perceived richness of real-world marketing stimuli. In the real-world personality, rational thought, social motivations, and situational factors determine consumer behaviour (Conejo et al. 2007). A further limitation of neuroimaging techniques such as FMRI is the cost. Sophisticated hardware and software tools are required and the cost of scanning one subject is estimated to be in the range of AUD 431 to AUD 575 per hour (Husing, Jancke & Tag 2006; Kenning, Plassmann & Ahlert 2007). Further to this is the issue of getting
participants. Not only does this experiment consume more time compared to conventional research methods such as survey or self report, but also people might feel intimidated by the equipment (Sørensen 2008).

With the advances in neuroimaging technology, scientists have also discovered a technique which not only can read consumers’ subconscious mind but also allows reproduction of what people are seeing or even remembering in a static and moving scene (Gourlay 2009). Figure 3 demonstrated the application of FMRI in which the FMRI signals were recorded and later used in reconstructing images seen by the participants. Therefore, the reconstructed images act as a form of communication between the respondents and researcher.

![Figure 3.3 – Flickering images were shown to participants while FMRI signals were recorded from the visual cortex which later was used to reconstruct the images that participants had seen](source)

For product design this could be a great advantage. For example, designers could ask consumers about their preferred design of a product and then use the images produced in the consumer’s mind as guidelines for the actual design. However, as with other neuroimaging techniques this method would undoubtedly suffer from a small participant number due to the cost and time involved. As such, the validity of results obtained from such a study would be questionable due to the potential lack of reproducibility to the wider population caused by a small sample size.

### 3.3.4 Room Effect

Maslow and Mintz produced the first version of the Room Effect method in 1956. The method examined the effect of room context on the judgements of people. Three rooms were used:

- A „beautiful“ room that elicited comments such as „attractive“, „comfortable“, „pleasant, and „pretty“.
• An “ugly” room that was described as “disgusting”, “horrible”, “repulsive” and “ugly”; and
• An “average” room.

Faces were then placed in the rooms. The result showed that faces were rated differently depending on the context in which they were viewed. Faces in the “beautiful” room were judged higher in “energy” and “well-being” than those in the “average” room, which in turn were rated higher than those in the “ugly” room (Wilson & Mackenzie 2000).

Canter, West, and Wools (1974) used the same concept in their research in the same year without using photographs of human faces. They instead presented participants with line drawings of rooms and asked them to indicate the type of person they would expect to find in those rooms. They then presented another group of participants with the same drawings and this time asked them to indicate their reactions to the rooms themselves. The results showed a strong relationship between the judgments of the room and the judgments of the people. For example, rooms regarded as being warm were likely to lead to the expectation of a pleasant person being found within. A room regarded as harmonious was found to relate to expectation of a powerful occupant.

Following the study by Canter, Maslow, and Mintz, a number of studies emerged in the 1960s and 1970s that examined the effect that the environment setting might have on “person perception” (Wilson & Mackenzie 2000). For instance, Campbell (1979) focused on judgments made by students on a professor’s office. The ratings included how comfortable the student would feel, how inviting the office would appear, and how welcome the student would feel. Another three ratings required the student to infer what the professor would be like considering the arrangement of the office. These were ratings on how similar the professor’s interests would be to those of the student, the degree to which the professor would welcome student visitors, and how busy and rushed the professor would be.

Derived from Environmental Psychology, which provides a systematic account of the relationship between person and environment (Russell & Ward 1982), the Room Effect method was also found to be suitable for this present research.
Figure 3.4 demonstrates the stimuli used for the Room Effect method developed by Canter, West, and Wool (1974). The stimuli contained head-and-shoulder superimposed photographs and three rooms with different interior background. Respondents were asked to judge the person. This test indicates that there was a relationship between people and their room in which the interior background modified the judgement of respondents towards the people.

Results from Canter, West, and Wool's (1974) show study that the Room Effect method is suitable for understanding people’s status and social identity in relation to a room or interior decoration. As a car is a product that sends a message about what kind of person the owner is, which can also be related to status and social identity, the Room Effect method suites the objective of this research and was therefore considered as the best method to investigate car perceptions.

Figure 3.4 - Room Effect *Source: (Canter 1977)
3.4 Product as Image and Symbol of Consumerism
3.4.1 Product Personality and Brand Personality

This research focuses on the area of user perception towards cars. As perception is closely related to human personality it is thus important to understand the congruence between the personality of a person and the personality of a product. Therefore, before looking at product personality in detail, it is worth defining the meaning of personality in order to provide a basis for how it can be related to products.

The study of personality can be defined as the “inferred hypothetical constructs relating to certain persistent qualities in human behaviour” (Kassarjian 1971 p. 409). It also can be described as “an individuals dynamic and organized set of characteristics that uniquely influences his or her cognitions, motivations, affect and behaviours in various situations” (Ewen 1998 p. 1). We often talk about someone’s personality and discuss what makes that person different from other people. This characteristic of personality is called individual differences (Boeree 1997). This shows that there is an awareness of personality on the people we mix with and this indirectly assists compatibility of inter-person relationships within society. By judging individual differences we are able to sense other people’s traits. For instance, if we were to ask someone for help, we might first judge the person as to whether they are kind and friendly.

We systematically infer people’s personalities largely based on visual static and visual-dynamic characteristics (Borkenau & Liebler 1995) such as the way they dress, hair colour and style, make-up and facial features like the shape of their eyes and nose. Montepare and Zeborowitz-McArthur (1988) also found that visual characteristics influenced the judgement of people’s personality traits.

Kassarjian (1971) argued that in marketing personality study is closely related to consumer behaviour studies which involves numerous marketing phenomena such as purchasing behaviour, innovation, media choice, segmentation, product choice, and risk taking. Kassarjian added that “studies of personality and consumer behaviour have a most impressive history ranging back to the earliest writings of the Chinese and Egyptians, Hippocrates, and some of the great European philosophers” (Kassarjian 1971 p. 409). As such the relationship between personality and product can be explained by referring to natural human behaviour.
Naturally, before individuals cultivate friendships with other people, they will not only identify their own concerns but will also judge the person’s personality according to their visual characteristics. If the individual personality appears congruent with the person who intends to establish a friendship, the relationship will most likely be cultivated.

This same type of behaviour can also be used with products. Usually, before an individual buys a car they would judge the visual characteristics of the car, which can be defined as the car’s personality. If the car satisfies the concerns of the person, and if the self concept of the person and the personality of the product are congruent (product-personality congruence), this should lead to the act of buying (Govers & Schoormans 2005).

Simultaneously, this personality factor relates to the form of the product, which is connected to consumers’ psychological and behavioral responses (Bloch 1995). According to Cooper and Kleinschmidt (1987) consumer satisfaction with form plays an essential role in determining the success of a product.

As previously noted, beyond their functional utility products have “symbolic meanings”. Part of this symbolic meaning is accounted for by concepts like brand personality and product-user image, which describe the symbolic meaning associated with the brand or product class. However, the physical product also carries symbolic meaning. It is described with human personality characteristics and is called “product personality” (Govers & Schoormans 2005). Govers (2004) introduced the concept of product personality in line with the concept of brand personality by referring to Aaker’s (1999) research that was based on self congruity. Aaker proposed that consumers evaluate brands that are congruent to their personality. Although product and brand come in the same package, Govers and Mugge (2004) suggested that product personality differs from brand personality in that product personality refers to a specific product variant, which differs from a global brand.

Moreover, a specific product variant is less abstract than brand personality as it is directly related to the product itself (Govers & Schoormans 2005). Sirgy (1985) stated that products and services can be conceptualized as having personality images, just as people do. These personality images, or product images, can be
described as “a set of attributes such as friendly, modern, youthful, and traditional” (p. 195).

As for product personality, it is related closely to user-image congruence. Subsequently, “the effect of user-image congruence may be stronger for publicly consumed high status products than for products that are privately consumed” (Govers & Schoormans 2005 p. 194). Furthermore, research by Birdwell (1968) on personality and the way it affects the individual’s choice of automobiles showed that a significantly high degree of congruence existed in the way respondents perceived their cars and themselves. As for cars which are considered as high status products, the design or styling is closely related to user-image or product personality. User-image is about congruence between the individual’s status and the product personality. This in turn influences the consumer’s decision on whether to make a purchase and thus can be considered as an important criterion to designers and marketers. In addition, research done by Johansson-Srenman and Olof (2006) showed that people did care about both status value and environmental performance when they were going to buy a car. However, they tended to be more concerned with status then the environment.

During the product development process designers are aware of the importance of the product personality concept. By incorporating product personality designers can attract consumers into buying and this can be considered as part of the successful marketing of a product. Incorporating personality in the product can be termed as “anthropomorphizing” as it encourages consumers to see human images and distinct personalities in products. For example, the Mazda 3 is seen to have a human-like facial expression with smiley facial features (see Figure 3.5). A study conducted by Daimler-Chrysler discovered that looking at the front of a car lit up the same area of the brain that handles faces, which may explain the popularity of “friendly-looking” cars such as Mini Coopers (Anjana 2006). The „face of a car“ has been discussed by car makers and they have identified certain areas of a car that correspond with aspects of the human face, such as headlights for eyes, the grille for a mouth and the bumpers as jaws (Welsh 2006). A study conducted by Aggarwal and McGill (2007) exploring anthropomorphism used cars as a stimuli and discovered products that lacked human features were evaluated less positively than products that were presented with human-like features. This further explains the importance of creating
personality in a product thus making it more appealing to consumers by automatically attracting their attention.

![Mazda 3](image-url) *Source: (Twomey 2008)*

Besides relating product personality with anthropomorphism, it is also worth studying how it interacts with elements in product design such as function, shape, and materials. Kesteren’s (2005) integrated model explained that the interaction between product personality and function is about the different personality portrayed by products with a similar function. For instance, golf shoes and basketball shoes both have the same function, which is to support and protect the feet. Golf shoes, however, serve to make the consumer look elegant yet comfortable together with the additional function of stability while swinging a golf club. Basketball shoes need to have shock absorption and hence, are generally of a sporty design. Relating to this, product personality can influence function, for instance basketball shoes have become a street fashion and are interchangeably used for playing basketball and everyday wear. At the same time, there is an interaction between product personality and shape whereby the shape of a product can influence the perceived personality of a product (Kesteren, Stappers & Kandachar 2005). For example, “angular forms are associated with dynamism and masculinity, while roundness evokes softness and femininity” (Creusen & Schoormans 2005 p. 66) In the case of Jean Paul Gaultier’s perfume bottles, the voluptuous shape of a woman’s body is used to give the woman’s perfume a sexy personality while the men’s perfume bottle portrays manliness (see Figure 3.6).
The interaction between product personality and materials is about the materials aesthetics and expressions. For instance, plastic is seen as ordinary and cheap, while metals are seen as exclusive and clean (Kesteren, Stappers & Kandachar 2005). In addition, when users see the colours of a material, feel the texture and weight and hear sound when moving the object, these sensory experiences contribute to the experiences of the user, thus creating personality (Kesteren, Stappers & Kandachar 2005). Moreover, besides being one of the factors that creates product personality, the effect of materials usage is an advantage for marketers as it assists them in positioning and determining the market segment and product price. The picture of two trashcans (see Figure 3.7) shows that different materials can portray different personality.

Product personality is also judged through visual characteristics. Visual characteristics also known as visual aesthetic characteristics are the terms given to the shape of a product and the materials used. Starting from the study of personality theory, research has been extended into products that relate to human personality to show how visual aesthetic characteristics are linked to product personality perceptions (Brunel & Kumar 2007). It has been shown that consumers’ perceptions
of product personality can be influenced by variations in design shapes and materials (Kesteren, Stappers & Kandachar 2005). Furthermore, consumers have been able to identify these intended product personalities (Govers & Mugge 2004). It has also been demonstrated that consumers prefer product design with product personalities congruent with their own (Govers & Schoormans 2005). Therefore, it is important for a designer to achieve a balance between all relevant product characteristics to create a product with a consistent personality (Norman 2004).

Further to this is identifying the human personality dimensions possessed by a product, which would help create a guideline for designers to design excellent products. Govers (2004) developed a scale to assess the complete product personality of product variants. Testing suggested that out of five dimensions of agreeableness, extroversion, conscientiousness, neuroticism and openness (McCrae & John 1992), only three were found relevant to products; agreeableness, extroversion, and conscientiousness. Frequent use of these scales should enable designers to determine the characteristics of different product variants which would allow them to gain insight into the product characteristics associated with a particular personality characteristic (Govers & Mugge 2004).

In contrast to these tangible elements for judgement on product personality, brand personality judgement is considered intangible. According to Azoulay and Kapferer (2003), advertiser and marketing practitioners were the first to coin the term “brand personality”, before academia studied the concept. As early as 1958, Martineau, who in the earlier days used the word “personality” and “character” in his study on personality using retail stores as subject matter, referred to non-material dimensions that made a store special (Azoulay & Kapferer 2003).
According to Plummer (1984) there are three different classes of characteristics that can describe brand:

- physical attributes
- functional characteristics or consequence of using a brand
- characterizational.

However, of these only characterizational portrays brand personality. According to Plummer (1984), “brand may be characterized as modern or old-fashioned, or lively, or exotic and these characterizational aspects of the brand are what we call the brand’s personality” (p. 29).

Murphy et al (2007) argued that human personality can be clearly interpreted in the brand’s user imagery with regards to personality traits through the perception of the company’s employees and brand’s product endorsers and through product related attributes, product category associations, brand name, symbol or logo, advertising style, price, and distribution channel. If the interpretation in a consumer’s head is “I see myself in that brand” or “I see that brand in myself”, this indicates that the brand is in line with their personality (Plummer 1974). This supports Mulyanegara’s (2009) notion that consumers would buy a brand that reflects their personality.

The question then is how brand personality is measured. Initially the brand personality concept was measured through qualitative data rather than quantitative (Hanby 1999; Voeth & Herbst 2008). It was Aaker (1997) who first applied a quantitative method in her research, where she developed a measurement scale called the Brand Personality Scale. Aaker’s conceptual framework for the scale was based on US psychologists Costa and McCrae’s “Five-factor Model of Personality” (McCrae & Costa Jr 1992; Voeth & Herbst 2008). As a result she identified five brand personality dimensions and 15 facets:

- Sincerity (down-to-earth, honest, wholesome, and cheerful);
- Excitement (daring, spirited, imaginative, and up to date);
- Competence (reliable, intelligent, and successful);
- Sophistication (upper class and charming);
- Ruggedness (outdoorsy and tough).

Aaker’s brand personality scale was subsequently widely used by researchers. The validity of the scale was questioned in one study by Azoulay and Kapferer, who
argued that the “current scales of brand personality did not, measure brand personality, but merged a number of dimensions of brand identity of which personality was only one” (Azoulay & Kapferer 2003 p. 143). However, no other research identified this an issue, and the scale is still being used by researchers in business and marketing to understand the brand personality of various products locally and internationally (Guthrie, Hye-Shin & Jaehee 2008 ; Milas & Mlačić 2007 ; Wang & Yang 2008).

Just as a company establishes their brand personality, they must also be able to manage it. According to Wee (2004), “the management of brand personality included the development and manipulation of a set of intangible brand elements such as imagery of users, imagery of origin, brand emotional values, brand identity, brand relationships, and buying experiences which is conveyed by the elements of the marketing mix such as product features, advertising, packaging, price policy, and retail outlet environment” (p. 320). For instance, advertising is one of the ways of developing effective brand personality by incorporating human metaphor. According to Lee and Rhee (2008), with human metaphor, brand personality will deliver a more realistic and comprehensible explanation for brand identity which helps marketers to target their communication. The research on brand personality has covered various product categories and consumer segments such as wine (Boudreaux & Palmer 2007), formula one racing (Donahay & Rosenberger 2007), restaurants (Siguaw, Mattila & Austin 1991 ; Wee 2004), fashion (Lee & Rhee 2008 ; Mulyanegara, Tsarenko & Anderson 2009), tourism (Ekinci & Hosany 2006 ; Hosany, Ekinci & Uysal 2006 ; Murphy, Benckendorff & Moscardo 2007 ; Murphy, Moscardo & Benckendorff 2007) and education (Opoku, Abratt & Pitt 2006 ; Opoku, Hultman & Saheli-Sangari 2008).

In relation to cars, brand personality research has also been undertaken to discover the local consumer perception towards local and international car brands. Research conducted by Wang and Yang (2008) investigated the relationship between brand personality, country-origin-image and consumers’ car purchase intention. The results revealed that both brand personality and country-of-origin image exert significant positive effects on consumers’ purchase intention. This suggests that the “more positive the brand personality is, the higher the consumers’ purchase intention towards the brand would be” (Wang & Yang 2008 p. 469). Research by Rojas-Mendez (2004) measured the Ford brand personality in Chile by using the
framework developed by Aaker (1997). The results indicated that the „ruggedness” dimension originally proposed by Aaker (1997) was not reliable, nor valid. However, this study did “reinforce Aaker’s proposition that across different cultures some dimensions sharing similar meanings emerge, although not with exactly the same attributes” (Rojas-Mendez, Erenchun-Podlech & Silva-Olave 2004 p. 249).

Therefore it is imperative that both product and brand personality be considered as important criteria when trying to understand consumers purchasing intentions. For example, if a person wants to purchase a car, he or she at the same time will examine its entire design, styling and brand. Next, there will a process of product and brand imagery as to whether both personality elements match the person’s personality. If the elements are congruent to the consumer’s personality and self concept, this can influence him or her to purchase the car. This shows that the success of a product is determined partially on whether product personality and brand personality are complementary to each other.

3.4.2 Five-Factor Model (FFM) of Personality

The Five-Factor Model (FFM) of personality has been used to study product personality, brand personality and user perception. Govers and Mugge (2004) used the model to examine the influence of congruity between the personality of a person and the personality of their product (i.e., product-personality congruence) on product attachment.

According to De Raad (1998) the FFM identifies „basic trait factors” that encapsulate the range of human „personality characteristics. Due to a “rapid convergence of views regarding the structure of the concepts of personality (i.e. the language of personality)” (Digman 1990 p. 418), the interpretation of dimensions in FFM changes from time to time (Fiske 1949) (see Table 3.1).

Before the FFM were established, Allport and Odbert (1936) as well as Cattell (1943, 1945) made a concerted effort to identify relevant distinguishable traits of personality and “the first decades of the work of these pioneers form a kind of incubation period” (De Raad 1998 p. 114). FFM was first suggested by Fiske in 1949 and conceptualized by Tupes and Christal in the early sixties, referring to Cattel's traits variables (De Raad 1998).
Naming and identifying the factors was based on two prominent systems derived from lexical tradition and questionnaire tradition (McCrae & John 1992). Table 3.1 show the factors established that were derived from these two well-known systems starting from Fiske (1949) to Lorr (1986).

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<td>Norman (1963)</td>
<td>Surgency</td>
<td>Agreeableness</td>
<td>Conscientiousness</td>
<td>Emotional</td>
<td>Culture</td>
</tr>
<tr>
<td>Borgatta (1964)</td>
<td>Assertiveness</td>
<td>Likeability</td>
<td>Task Interest</td>
<td>Emotional Stability</td>
<td>Intellect</td>
</tr>
<tr>
<td>Cattell (1957)</td>
<td>Exvia</td>
<td>Cortertia</td>
<td>Superego Strength</td>
<td>Anxiety</td>
<td>Intelligence</td>
</tr>
<tr>
<td>Guilford (1975)</td>
<td>Social Activity</td>
<td>Paranoic Disposition</td>
<td>Thinking Introversion</td>
<td>Emotional Stability</td>
<td>Intellect</td>
</tr>
<tr>
<td>Digman (1988)</td>
<td>Extraversion</td>
<td>Friendly Compliance</td>
<td>Will to Achieve</td>
<td>Neuroticism</td>
<td></td>
</tr>
<tr>
<td>Hogan (1986)</td>
<td>Socialability &amp; Ambition</td>
<td>Likeability</td>
<td>Prudence</td>
<td>Adjustment</td>
<td>Intellectance</td>
</tr>
<tr>
<td>Costa &amp; Mc Crae (1985)</td>
<td>Extraversion</td>
<td>Agreeableness</td>
<td>Conscientiousness</td>
<td>Neuroticism</td>
<td>Openness</td>
</tr>
<tr>
<td>Peabody &amp; Goldberg (1989)</td>
<td>Power</td>
<td>Love</td>
<td>Work</td>
<td>Affect</td>
<td>Intellect</td>
</tr>
<tr>
<td>Tellegen (1985)</td>
<td>Positive Emotionality</td>
<td>Constraint</td>
<td>Negative</td>
<td>Emotional Stability</td>
<td></td>
</tr>
<tr>
<td>Lorr (1986)</td>
<td>Interpersonal Involvement</td>
<td>Level of Socialization</td>
<td>Self-control</td>
<td>Emotional Stability</td>
<td>Independent</td>
</tr>
</tbody>
</table>

Table 3.1 – The Five Factor Model (FFM) of personality from Fiske (1949) to Lorr (1986).

*Source: (Digman 1990)*

In describing human personality, the first dimension of personality that was first agreed on was Eysenck’s extraversion/introversion which was related to traits like sociable, gregarious, assertive, talkative, and active. This was followed by neuroticism or emotional stability (anxious, depressed, angry, embarrassed, worried, and insecure), agreeableness or likeability (courteous, flexible, trusting, good-natured, cooperative, forgiving, soft hearted, and tolerant), conscientiousness or conscience (hardworking, achievement-oriented, and persevering), and finally intellect or intelligence (imaginative, cultured, curious, original, broad-minded, intelligent, and artistically sensitive) (Barrick & Mount 1991 p. 3-5).

In terms of the universality of the FFM of personality, it has been explored in different cultures (McCrae & Costa 1997). By 1998, these “taxonomies of individual differences had been developed in at least eight different countries (the United State
of America, The Netherlands, Germany, Hungary, Italy, Poland, the Czech Republic and the Philippines)” (De Raad 1998 p. 114).

Subsequently, FFM has provided a common language for psychologists from different traditions to organise research and a guide to the comprehensive assessment of individuals that should be of value to educational, industrial/organizational and clinical psychologists (McCrae & John 1992). Besides using FFM as a tool in understanding how personality relates to different kinds of behaviour (Reilly, Lynn & Aronson 2002), it has also been used in product design in order to see how visual aesthetic characteristics are linked to product personality perceptions (Brunel & Kumar 2007).

3.4.3 Product Symbolism & Self Image

Levy (1999) stated that “People buy things not only for what they can do, but also for what they mean” (p. 74). Levy believed that every product displayed on shelves in showrooms possessed symbolic meanings. Consumers analyse these meanings in terms of whether there is congruity to their lifestyle and status. Products can be classed in two categories which consist of highly symbolic and conspicuous product and less symbolic and conspicuous product. Munson and Spivey (1980) carried out research using cars and tennis rackets as comparison products. They showed that automobiles were highly symbolic and conspicuous, while a tennis racket was less conspicuous and symbolic (Munson & Spivey 1980). The example given shows two different product classes in which the automobile signals image and class whereas the tennis racket is perceived as less important. The racket portrays the owners’ status and style, but most importantly must satisfy functional needs.

This present research concentrates on the perception towards a product, therefore it is important to explore how products serve as symbols and the effect that symbolic meaning has on consumer behaviour. Before continuing to explore the meaning of product symbolism the word symbol should be defined. Merriam-Webster online edition (2011) defines symbol as;

- an arbitrary or conventional sign used in writing or printing relating to a particular field to represent operations, quantities, elements, relations, or qualities,
- an object or act representing something in the unconscious mind that has been repressed,
There are numerous definitions of "symbol" produced by researchers from different fields such as anthropology and semiotics. Anthropologist Leslie A. White (1940) defines "symbol as a "thing", the value or meaning of which is bestowed upon it by those who use it. A symbol may have any kind of physical form such as a material object, a colour, a sound, an odour, a motion of an object, and a taste" (p. 453).

Cultural anthropologist Sherry Ortner (1973) defines symbol as a “vehicle for cultural meaning” (p. 1339). She identifies and divides symbols into two distinct categories; summarizing symbols and elaborating symbols. A summarizing symbol is "a symbol which is seen as summing up, expressing, and representing what a system means" to someone in an emotionally powerful and relatively undifferentiated way (Ortner 1973 p. 1339). In other words, it dilutes a broad, more complex set of concepts into a unitary form and generalized whole. For instance, in the statement an electric vehicle represents environmental-friendly transportation, the statement expresses a complex set of scientific issues about pollutants and greenhouse gas emissions with the electric vehicle serving as a symbol of conservation. An elaborating symbol, on the other hand, works by “sorting out complex and undifferentiated feelings and ideas, making them comprehensible to oneself, communicable to others, and translatable into orderly action” (Ortner 1973 p. 1340). In other words, an elaborating symbol addresses specific ideas rather than generalized ones. For instance, “automobiles can be used as a means to divide a diverse population. Some consumers identify themselves based on the type of vehicle they drive and view themselves as different from those that drive another type of vehicle. To declare oneself as "not a minivan person" or someone else as "pickup truck guy" is to use the automobile as an elaborating symbol, as a tool to categorize elements (in this case, people) in one’s environment” (Heffner 2007 p. 28).

According to Heffner (2007) symbols relating to objects and behaviours are interpreted differently by different groups and in particular by members of different cultures. Saussure’s model defines symbol as part of a larger concept known as a sign, composed of two parts; signer and signified (Saussure 1959). The symbol or
signifier is interpreted as a word or material form of the sign that portrays "something" which can be seen, heard, touched, smelt or tasted. Meanwhile, signified is interpreted as a mental construction of "something" that supplies the meaning (Chandler 2002; Heffner 2007). For instance, a Volvo car can be interpreted as a symbol of safety. The Volvo car is the signifier, and safety is the signified concept. The combination of both forms a sign that connects a tangible object or product and an intangible thought or idea.

Products contain symbolic meaning that can reflect status of the owner. It is considered as an important step (Heffner 2007) that consumers will self-evaluate before owning a product. Based on the self evaluation, products are consumed based on their congruity to consumer needs, which are mainly related to symbolic features and their social meaning (Solomon 1983). When “consumer products serve as symbols function and meaning coexist and often blend together” (Heffner 2007 p. 30). As a product provides symbolic meaning, the term “product symbolism” is widely used by social science researchers to define the relationship between product and symbol (Allen 2002; Burroughs 1996; Hirschman 1986; Hyatt 1992; Solomon 1983).

Product symbolism according to Allen (2002) is the image of the product, encompassing abstract ideas and association with the product as well as beliefs about the kinds of people who use the product. Product symbolism is often “consumed by the social actor for the purpose of defining and clarifying behaviour patterns associated with social roles” (Solomon 1983 p. 320). More specifically, product symbolism theory stresses the socially descriptive nature of products and their relationship to consumers (Hyatt 1992). Product symbolism is considered closely related to studies of the extended self and consumer stereotyping. Extended self study deals with “how people encode who they are into external expressions (product ownership), while consumer stereotyping research is concerned with how observers decode external product ownership information into a meaningful impression of the consumers of those products” (Hyatt 1992 p. 299). For instance, if a person drives a Lamborghini, he or she actually encodes themself together with the symbolic meaning of the sports car towards the people around them, that is, their surrounding society. Lamborghini owners use their car as a vehicle of self extension in order to communicate with their society. The surrounding society will decode the sports car symbolic content and then judge the owner based on
individual symbolic interpretations of their own. For example, they might symbolise the owner as elegant, stylish or sporty. In a way, this example shows the symbolic interaction between consumer, product/brand and people (Figure 3.9).

Symbolic interaction or interactionism as defined by Solomon (1983) is a body of thought that originated in the early writings of American social psychologists and sociologists which focuses on the process by which individuals understand their world. It asserts at least three fundamental principles (Kinch 1967; Solomon 1983 p.320) that is;

- A consumer’s self-concept is based on perceptions of the responses of others;
- A consumer’s self-concept functions to direct behaviour;
- A consumer’s perception of the responses of others to some degree reflects those responses.

Product symbolism in purchasing products is considered as an act of consuming symbols of products for self extension. For a product to serve as a symbolic communicative device it must “achieve social recognition and the meaning associated with the product must be clearly established and understood by the related segment of society” (Grubb & Grathwohl 1967 p. 24). Therefore a product is consumed when it is understood by society and helps create individual identity. Heffner (2007) places consuming symbols of products in two categories; products as self-expression and products as self-creation. According to Heffner “products as

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Figure 3.9 – Symbolic interaction between consumer, product/brand and people

*Source: author’s own*
self-expression involves the use of product meanings to enact or portray one’s own identity while products as self-creation is about individuals manipulation towards their own identities and the meanings of a product” (p. 32). Based on this, he identified four approaches that compose both products as self-expression and products as self-creation; conspicuous consumption, self-congruity, symbolic interactionism, and finally lifestyles and cultivation (Heffner 2007) (Figure 3.10).

Figure 3.10 – Consuming symbols: summary of approaches evaluating product meaning and personal identity  
*Source: (Heffner 2007)*

Consuming symbols or symbolic consumption according to Witt (2010) is “an attempt to signal status gain group membership or achieve self-esteem by means of the consumption of certain goods and services” (p. 2). As symbolic consumption is related to consumer behaviour, it is the least dependent product characteristic of technology. It is always in transit since it is “constantly flowing to and from its several locations in the social world, aided by the collective and individual effort of designers, producers, advertisers and consumers” (McCracken 1986 p. 71). Symbolic consumption involves the process of creation and interpretation of a product which can be named as encoder and decoder. In relation to this, a person who owns a product is considered as the encoder. For instance, through a specific
product the encoder will communicate something about themselves. The process will be complete when the decoder attaches symbolic meaning to the product as well (Schoenbachler, Ayers & Gordon 1995). In other words, “consuming symbols are employed as a means of encoding messages to others through their consumption, and also decoding messages from others” consumption practices” (Placentini & Mailer 2006 p. 252). The success of the decoding process is dependent on the individual’s knowledge of the codes involved (McCracken & Roth 1989) and is supported by their self-experience, exposure and background. In relation to self-experience, exposure and background, the consumed products may be decoded in two different meaning. For instance, buying unbranded washing liquid may mean either „the buyer is a poor person” or „buyer is a clever consumer”. If the perceiver was brought up in a poor family, the owner of the product may be seen as „clever”, while if from a rich family the product owner may be perceived as „poor”.

Considerable research has been undertaken in order to understand consumer behaviour in relation to symbolic consumption. Fashion and clothing are two of the areas that have attracted researchers to understand how consumers use these products to sustain and locate themselves in society. Earlier research in these areas showed that clothing plays a significant role in shaping a person’s self-identity and consumption symbolism (Belk, Bahn & Mayer 1982 ; Freitas et al. 2007). For example, Placentini and Mailer (2006) explored the subject of symbolic consumption with specific reference to clothing in the teenage market. The goal of their research was to learn more about the ways in which young people use clothes, and to develop an understanding of why they use these symbols in this way. Thirty-eight young people were interviewed with age, sex, and social position all considered. The research found that teenagers consumed products to signal prestige, which showed the relevancy of the conspicuous consumption concept for young people. The research concluded that the “clothes choices made by young people are closely bound to their self-concept and are used both as a means of self-expression and as a way of judging the people and situations they face” (Placentini & Mailer 2006 p. 251). Similarly, in research by Banister and Hogg (2004) the “relationship between self-esteem and the rejection of goods and brands within the context of fashion consumption by young professionals” was examined (p. 850). Based on this investigation, which was exploratory in nature and used qualitative methods,
Banister and Hogg produced a framework. Derived from the study of consumer behaviour researchers such as Grubb and Grathwohl (1967), Markus and Nurius (1986), Sirgy (1997) and Higgins (1994) the framework provides assistance for marketing managers to be better equipped to understand and predict the rejection of products and brands (Banister & Hogg 2004). In another study, Holman (1980) investigated how clothing expresses something about the user. This research was considered as the first attempt at decoding clothing usage within one context, and thus one of the first attempts to describe the actual usage of clothing as a language (Holman 1980).

As the concept of product symbolism is considered important in signalling self identity and the extension of self, conveying intended symbols or intangible attributes of products would not be successful without the assistance of a group of system specialists attached to business organizations. Research about consumers as recipients of product meaning has been presented along with discussion about the process of how product symbolism is being created, managed, and disseminated. Shaping product symbolism in this context requires a combination of several system specialists and needs to be conducted in different level of processes. Hirschman’s (1986) research discussed and proposed the process of product symbolism and symbolic communication based on the sociological model of a culture production system. This research also suggests that “culture production systems are responsible for providing products with meaning prior to their dissemination to consumers” (Hirschman 1986 p. 327). Acting through three successive and interactive subsystems in the culture production systems (Figure 3.11), the creative subsystem, managerial subsystem and communication system, it makes available to consumers various sets of tangible and intangible product attributes (Hirschman 1986). The creative and managerial subsystem compose symbolic content of a product and disseminate it commercially while the communication subsystem strengthens consumer symbolic meaning based on a physical product form created in the creative subsystem by providing information about products to consumers through advertising. Besides being part of a cultural system, advertising is recognised as one major sources of symbolic meaning (Elliott & Wattanasuwan 1998).
As the concept of product symbolism is understood to be the image of the product linked with the consumers’ self-image, the concept of conspicuous consumption needs to be considered, since both are inter-related and complement each other. Furthermore, it was noted in Heffner’s (2007) framework that conspicuous consumption is considered as one of the approaches to the symbolic consumption concept known as product as self-expression (Figure 3.10).

Conspicuous consumption theory was introduced by a Norwegian-American sociologist and economist, Thorstein Veblen in his book entitled Theory of the Leisure Class in 1999. It is based on the “evolution of a leisure class whose members are not required to work but appropriate a surplus produced by those who do work, the working class. Once societies start to produce a surplus the relationship between private property and status become increasingly important” (Trigg 2001 p. 100). Related to this, a separate social class is developed in the society in which those who can afford to own property would be labelled as having status and prestige which is named as the leisure class group. Those who cannot afford property are considered to have no status and prestige, and therefore belong to the working class group of people. Once an individual has earned status to gain and maintain respect from society, they have to display wealth. Veblen identifies two
main ways in which an individual can display wealth; through extensive leisure activities and through lavish expenditure on consumption and services. Both are understood to be wasteful. “In the one case it is a waste of time and effort, in the other it is a waste of goods” (Trigg 2001 p. 101; Veblen 1899). The act of engaging the wasteful doings is the style of how the leisure class group ostentatiously display their prestigious wealth. As the population becomes more mobile, people may be less informed about leisure activities, therefore the display of wealth through lavish expenditure on consumption of commodities becomes more significant than the extensive leisure activities (Veblen 1899).

Indirectly, conspicuous consumption theory is considered as an early study of product meaning and the role of product in extending self. Besides the analysis centres of this theory around status, “the ability of products to impart enhanced status on their owners” has also been examined (Heffner 2007 p. 34). Status in this context relates to luxury products and brands. As noted by Truong et al. (2008) there is an affluence associated with luxury brands which causes a growing number of luxury manufacturers to stretch their brands to capture enthusiastic middle-class consumers by offering lower entry-prices. Among the most evident examples are the BMW 1 series, Calvin Klein jeans sold at discount retail stores, and online retailers offering luxury watches at half-price, all of which implies that more consumers are now willing and able to pay a price premium for higher quality, higher status products (Truong et al. 2008). This scenario, together with Veblen’s seminal theory, has led to various studies concerning consumers and status that relate to the consumption of conspicuous goods. This shows that Veblen’s theory is still applicable, although first published over a hundred years ago. Researchers have often used the words conspicuous consumption interchangeably with status consumption, for example research by Eastman, Goldsmith, and Flynn (1999) which argues that status consumption is based on conspicuous consumption. They defined status consumption as “the motivational process by which individuals strive to improve their social standing through the conspicuous consumption of consumer products that confer and symbolize status both for the individual and surrounding significant others” (Eastman, Goldsmith & Flynn 1999 p. 42). Only in this context individuals are individuals assumed to be group of rich people as this activity involves buying a high status product to inflate their ego (Eastman, Goldsmith & Flynn 1999).
However, O’Cass and McEwen (2004) state that “the desire for status is not exclusive to the wealthy and it may be that outward symbols of status are meaningful to both the wealthy and those of modest means... even in third-world countries people are often attracted to and indulge in aspects of conspicuous consumption before they have adequate food, clothing and shelter” (p. 29). Therefore, the concept of conspicuous consumption can be applied to all classes, rich and poor.

Goods like automobiles are perceived as status products which can improve social standing for either the rich or poor and are constantly used as a subject matter in research concerning conspicuous consumption. Although automobiles are seen in all classes of people, their use can affect peoples’ perception towards their owner. The higher the perceived vehicle status, the more positively people respond towards the driver (Doob & Gross 1968; Solomon & Herman 1977). In other words, cars contain a high symbolic content, whereby they are not only being used for the purpose of self-respect but also for social approval, regardless of social class and age.

Research conducted by Shukla (2008a) investigated the issue of conspicuous consumption amongst middle aged consumers from 40 to 60 years old and focused on the psychological and brand antecedents, using the context of automobile buying behaviour. Most research on conspicuous consumption has targeted the youth segment categories like fashion accessories, mobile phones, and other personal accessories (Chao & Schor 1998; O’Cass & Frost 2002). However, according to Shukla (2008b) consumers in the older age group are more likely to have a higher income and a better job and are willing to spend their hard earned cash on big ticket items such as cars and houses, making them a lucrative untapped segment in the area of conspicuous consumption. In this research a quantitative research methodology was used by employing a structured questionnaire and quota sampling. The result suggested that psychological and brand antecedents are of crucial importance among middle-aged consumers in influencing their conspicuous consumption (Shukla 2008a).

In another study on automobile and conspicuous consumption, Au (2007) looked at how this concept is being applied with the Chinese automobile consumer. A qualitative research method was used by utilising semi-structure interviews, to
understand the reasons for buying luxury vehicles. The results showed that many Chinese people bought vehicles because they wanted to show off their wealth. For those people, owning a car was for improving self-image, rather than purely for transportation, and can be regarded as conspicuous consumption. On the other hand, there were still some Chinese people buying vehicles for their functional benefits, instead of for status, and their consumption was thus not “conspicuous” (Au 2007).

Product symbolism therefore links closely to self image. Allen (2002) noted in his research that empirical evidence shows that individuals attend to product symbolism when forming an overall product preference. This he said was due to individuals being motivated to maintain, express, and enhance self-concept. Assessing self-concept includes not only evaluation of one’s physical being but evaluations of one’s self as strong, honest, good-humoured, sophisticated, reserved, just, guilty and a thousand other ideas (Birdwell 1968). This is then reflected in every human action, including the purchase of goods and services (Birdwell 1968). In the process of purchasing goods there is an interaction between product and consumer and the symbolic content of the product will be assessed. If the level of congruity between the product-image and consumers’ self-image is high, there will be motivation to buy (Figure 3.12) (Sirgy 1982). A purchase is not likely to take place when there is a lack of congruency between the product image and self-concept (Onkvisit & Shaw 1987).
Birdwell (1968) demonstrated that self-image was directly related to purchasing behaviour. The hypothesis of the study was that an automobile owner’s perception of their car is essentially congruent with their perception of themself. The result showed a high degree of congruency between an owner’s perception of their automobile and themself and that automobiles appear to be extensions of the owner’s image of self. Therefore if the product matches with the consumers self concept, they may buy a product because they feel that the product enhances their own self-image, and purchasing provides a way for them to express themselves (Heath & Scott 1998). This statement was supported by Sirgy (1982) and Belk (1988) who suggested that people evaluate products using the same dimensions by which they describe themselves.

Self-concept is defined as the way people look at themselves (Hong & Zinkhan 1995). The role of self-concept has been investigated in numerous different contexts, such as implicit behaviour patterns (Greeno, Sommers & Kernan 1973), advertising perception (Debevec, Spotts & Kernan 1987; Domzal & Kernan 1993), advertising effectiveness (Hong & Zinkhan 1995), product perception (Hamm & Cundiff 1969), self-concept and brand preference, brand attitudes and purchase
intentions (Graeff 1996), symbolic interactionism (Leigh & Gabel 1992) and specific behaviour (Gutman 1973).

In product design, research by Franke and Piller (2004) analysed the “value created by so-called ‘toolkits for user innovation and design,’ a new method of integrating customers into new product development and design” (p. 401). In this study a simple design-focused toolkit was used whereby users were given a chance to create their own watches. Creating the product by themselves self is likely to provide a psychological benefit to users. As the toolkit was a design interface that could be accessed through the manufacturer’s websites, the feedback on the outcome could be seen by the manufacturer (Franke & Piller 2004). This was not only beneficial for users in learning their preferences interactively (Von Hippel & Katz 2002) but also to the manufacturer’s product development team as they were able to discover user affective needs to suit their self concept.

Research by Evans (1989) also discussed self-concept theory in conjunction with fashion branding and innovation theory. Evans suggested that fashion branding could be an important strategic marketing approach for the industry to fight its way out of long-term structural decline and, if based on relevant and specific aspects of innovation and self-concept theories, might be manifested positively in fashion promotional plans. As self concept can be defined as the combination of the physical and mental „self”, applying it into apparel marketing is significant since garments and cosmetics are physically worn together.

In research involving self-concept, there are numerous studies that use cars as the product category (Birdwell 1968 ; Grubb & Stern 1971 ; Heath & Scott 1998). Research by Heath & Scott (1998) evaluated the application of product image theory and self concept in the motor vehicle market. Self concept and image congruency theory was examined under the conditions of actual market relating to products with similar physical as well as different brand images. Grubb and Stern (1971) used Volkswagens and Mustangs as the product category, which replicated Grubb and Hupp’s (1968) study and further tested the congruency among brand images, consumers” self concept and perceptions towards two brand types in relation to stereotyped user images. Johansson-Stenman and Olof (2006) proposed in their research that utility was derived by people through self image, which was influenced by their own perceptions of their preferences. Finally, Birdwell (1968) focused on the influence of image congruence on consumer choice. In this research
automobiles were selected randomly based on colour and model type from more than a hundred foreign and American cars manufactured and sold in the city where the study was conducted.

As a conclusion, this study of product symbolism and self image has identified the processes by which product symbolism is used by consumers in defining their self image.

Cars are believed to be products that are consumed partly for the purpose of status and social identity, so understanding these both areas is significant in understanding the relationship between product image and consumer personality. Furthermore, based on the data gathered, it is clear that this area is closely related to the study of product perception. Therefore understanding both areas is beneficial in searching for a suitable method to be used in this research.

3.5 Cross Cultural Study

3.5.1 Cross Cultural Study in Design

This research was carried out with international participants and therefore the inclusion of cross-cultural studies is crucial. As the cultural background of each country differs, the perception of Proton cars is expected to be dissimilar in terms of product appearance in design and styling. Since it is the intention of Proton to be globally recognised in the automotive industry, it is important for the company to have a more in-depth knowledge of how consumers in various countries perceive its products, as the link of symbolic association may vary across countries and cultures in term of object and colour (Usunier 2000). Hult, Keilor, and Hightower (2000) in their research which investigated relevant product attributes between French and Malaysian consumers identified attributes of products as being particularly important to consumers in different markets. By understanding the product attributes that differ across markets firms will be in a better position to match their product differentiation strategy to meet both the needs of the external market and the requirements of the firm’s internal resource base (Hult, Keillor & Hightower 2000). In this context, design and styling are considered concrete attributes (physical product characteristics) and are important in influencing the consumer’s purchasing decision. As for the design field, “culture plays an important role and „cross cultural design” will be a key design evaluation point in the future” (Rungtai et al. 2007 p. 146).
In the consumer behaviour literature, culture has long been acknowledged as a powerful force shaping consumers motivations, lifestyle and product choices. These three concepts have cultural impact as they exert a powerful influence on consumer behaviour in the evaluation and purchase of products and on perception of products and brands (Quester, Karunaratna & Goh 2000). Allan and Sik Hung (1999) found that culture influences consumers in making decisions about product choice, especially when attending to a product’s meaning and making affective judgements. Furthermore, “culture indirectly influences product choice via attribute importance when consumers attend to a product’s functional meaning” (Overby, Woodruff & Gardial 2005 p. 148).

In cross-cultural settings, meaning of cues or attributes is directly affected by culture (Jacobs et al. 1991; Maheswaran 1994; Overby, Woodruff & Gardial 2005). According to research conducted by Jacobs (1991) significant differences in colour perceptions between consumers in China, South Korea, Japan, and the USA were found in relation to words, countries, institution and product packaging. In particular grey was associated with being inexpensive in China and Japan, but expensive, of high quality and dependable in the USA. Lee (2006) stated that different cognitive processes were used by people from different cultural backgrounds when reasoning. This statement strongly shows that in order to design and export products for certain countries it is important to investigate the local taste of countries as each culture establishes its own dynamic. That is, the understandings and rules of one culture may not be applicable in another (McCracken 1986) and this must be taken into account when designing and exporting a product to different countries.

In product design, Leur et al. (2006) conducted research on the cultural differences between the South Korean and the Dutch kitchen environment. The findings showed products and product experience of the kitchen environment were a reflection of cultural diversity. They concluded that the key for successful cross-cultural product design is based on the understanding the needs, tasks and environments of the people for whom the products are designed. In other cross-cultural research in product design, Quester, Karunaratna, and Goh (2000) aimed to establish the role that self-congruity played in evaluating product of global brands. The study investigated whether consumer’s individual perceptions towards products and their actual/ideal selves influenced their decision making when assessing and considering the purchase of global brands. These concepts were ased through a
cross-cultural study involving Malaysian and Australian users. Unexpectedly, the results showed that, the use of actual and self concept between the Malaysian and Australian users towards product evaluation differed, needing further investigation of this concept in the context of cross-cultural studies.

In the automotive industry, several cross-cultural studies have been carried out. For instance, a study on automotive branding by Hsieh and Lindridge (2005) explored the factorial structure of automotive branding in the context of a cross-national study. A survey was carried out in 19 countries using 52 types of automotive brands as stimuli for brand recognition. The results suggested that there are differences in terms of brand image factor structure across nations. Besides this, empirical evidence was provided supporting the applicability of multiple brand image dimensions towards symbolic, utilitarian, sensory and economic needs at global level. Research by Zineldin (2007) focused on identifying the critical events in the establishment processes of Swedish brands Scania and Volvo in Mexico, within the context of cross-culture and cross-border investment. The results suggested that appropriate measures and considerations need to be undertaken for any Swedish firms that intends to or already operates in the Mexican market such as comply and lobby in accordance with the environmental regulations.

As a conclusion, in producing an artefact involving consumers from various countries, the need to understand their cultural background is significant. In design, less information was found concerning product design and styling. This limitation could also be seen in automotive design and styling development. Therefore, the need for cross-cultural study is vital in the automotive industry, as a better understanding of cultural differences should benefit both car manufacturers and consumers. “Failure to acknowledge cultural differences often limits the products marketability” (Leur et al. 2006 p. 18). When a company really understands intercultural differences they can properly position their product according to the market needs. Moreover, cross-cultural research identifies the similarities and differences of various cultures, which is also useful for designing cars in a global context. Finally, by understanding a culture, a designer can produce a design that suits the preferences of users in different countries.
3.6 Summary

Data collection methods used by the automotive industry in marketing and design include many qualitative methods such as ethnography, survey, observation and interview. As outlined previously, these research strategies allow automotive companies to gain insight into consumer behaviour towards cars and motorcycles.

In terms of perception studies in design, brain imaging research was found to be more related to product design and brand compared to other areas such as design and emotion, semantic differential and Room Effect. Research on design and emotion by Desmet (2000) involved the car but this has not been commercialised as it is new and has not been tested by any automotive company.

In the case of the Room Effect method, although it has not being tested on cars, the testing on room interiors together with human models is interesting. These studies suggest that a room has a large effect on the perceptions of the person within it. As discussed, products can also effect the perception of the person to which they belong. A car is considered a high status product therefore it is reasonable to assume a car can affect a person self image. For this reason this method will be utilised for this research.

The Semantic Differential technique which acts as a tool for measuring the affective and emotional value of a product is also an interesting method of assessing user perceptions. This technique has been tested on products like shoes, telephones and furniture, and has also been tested on cars. As this technique requires minimum time and skill and is cheap to run, it is appropriate for this research.

The literature review of product personality and self image explained the relationships between product, human, and brand personality in building self image. It has been interesting to discover how human personality theory has been applied to product and brand in order to identify their personality. Therefore this theory has been used as a supporting method for this research.

The importance of understanding cultural differences in product design has also been reviewed. In particular existing methods used in understanding cross-cultural differences on product perception have been outlined. As this research uses international participants and differences in responses may be due to cultural norms, therefore this will be taken into account in this study.
4 RESEARCH METHODOLOGY

4.1 Introduction

In Chapter 3, the quantitative „Room Effect” method and the qualitative „Semantic Differential” method were selected to establish a mixed research method, to be used for the purpose of discovering how the Proton car is perceived, initially by Malaysian and Australian respondents and in the final research, by international respondents. The Five Factor Model (FFM) of personality was chosen as a supporting method in the application of the Room Effect theory. The research was conducted in two different phases for the purpose of testing the validity and effectiveness of these selected methods.

The research questions were (1) „Is there an effect the product has upon how people perceive its owner?” (2) „Are there any cultural differences?” (3) „Are there any gender differences?” In this section, the reason for selecting the „Room Effect” and the „Semantic Differential” methods, the selection of participants, the procedure of gaining informed consent, the protection of rights of the participants, the process of preparing the questionnaire for the pilot and actual tests, the methods of data collection and the data analysis will be described.

4.2 Overview of Research Methodology

In research there must be an effective strategy. At this initial stage, a broad array of options should be considered. As explained by Bryman (2001), there are two different strategies that can be adopted by researchers, quantitative and qualitative research. The former can be construed as a research strategy that emphasizes quantification in the collection and analysis of data, while the latter emphasizes words rather than quantification in the collection and analysis of data. These two strategies were considered to be appropriate for this study. Among the research strategies existing in qualitative and quantitative research are action research, ethnography, grounded theory, case study, survey, and experiment (Saunders,
Therefore, choosing appropriate research strategies depends on the nature of the research questions. Making the right formulation to answer the research questions is then probably the most important decision of a research study.

The research questions have been presented in the introduction to this chapter, and it was important to find a suitable strategy to answer these questions regarding the perception of Proton cars. Cars are usually judged by their appearance, especially their styling (Moulson & Sproles 2000), which is perceived in relation to the personality of their owner. For this reason, it was identified that the selected methods should not only focus on the car per se, but also focus on the person associated with the car. Therefore, the car perception studies were divided into two sub focus areas, which focused upon:

i) The product per se, how people perceive and evaluate it: in other words, to discover the meaning of cars on the respondents” judgement.

ii) The person associated with the product: in other words, the effect the design of a car has upon the perception of its owner and the owner”s personality.

In response to the sub focus areas above, the appropriate strategy identified for application in this study was conducting surveys. The surveys were divided into two categories, which were quantitative and qualitative. Between these two surveys, there are quite distinct differences in terms of how the information is collected and analysed. As noted earlier, the traditional quantitative survey stresses numbers, while qualitative surveys emphasize words (Malhotra 2006). According to Marsland et al. (2001), these two types of survey have “led to a polarization in collection and analysis of information, with „formal” quantitative techniques on the one hand, and „informal” qualitative methods on the other” (p. 1). They added that “there are areas where the two types of approach can benefit each other, leading to improved quality of information, which is required for appropriate decision-making at the various stages of research projects and programmes” (Marsland et al. 2001 p. 1).

Combining these two research methods within this study was not for the purpose of cross validating the same dimension of the research problem, which is understood as „triangulation” (Jick 1979). Instead it is a parallel method in which two different approaches contribute to a common understanding. The results of this combined approach are reported and interpreted in separate components in this research. It
RESEARCH METHODOLOGY

was intended that the results of both approaches be assessed, in order to verify whether the Room Effect method could applied to products, in this case automobiles. As the outcome of the results is intended for car designers, the use of a visual product evaluation technique appeared to suit this study.

In general understanding, visual elements are an important vehicle in communications. For instance, if foreigners arrive at the major airport of a country whose main language is not English, problems will occur if signage is only in that nation’s mother tongue. Given the wide range of nationalities using airports, it is not possible to include a sufficient number of languages in written signage. Therefore visual symbols, which are universally recognisable, are the only effective mode of communication, and are useful to foreigners in finding their direction. This shows the importance of visual elements as a universal language which acts as a bridge in communicating with people of different cultural backgrounds.

In relation to product design, visuals are commonly used by researchers, to be evaluated by users in eliciting their perceptions and responses (McDonagh, Bruseberg & Haslam 2002) to a product. The results together with the visuals are later referred to by designers, in order to get ideas for their design (Nakakoji, Yamamoto & Ohira 1999). In addition, researchers in design have used visual product evaluation techniques in developing understanding of user perception towards products. For instance, Desmet (2000) used a visual based instrument called PrEmo to assess emotions elicited by product appearance, focusing on car designs. A number of visual images were used by Wen-Chih and Tyan-Yu (2007) in order to investigate types and characteristics of household products that elicited pleasurable responses among young and college-age consumers. Previously, Creusen and Schoormans (2005) used visual images to identify the different ways in which the appearance of a product plays a role in consumer product evaluation and choice, to help product development managers in optimizing the appearance of products. Acknowledging this approach, it was decided that both qualitative and quantitative research could employ visuals as a means to stimulate user perception towards cars in this research. Therefore, two methods were identified that use visual product evaluation techniques, which are the „Semantic Differential” and the „Room Effect”. These both suited the two sub focus areas noted above. The employment of these methods is also in reference to the work of Crilly and Clarkson (2004), who identified three aspects of consumer evaluation towards visual form or product,
which are „aesthetic”, „semantic” and „symbolic”. According to Crilly and Clarkson, „aesthetic” evaluation is related to the attractiveness or unattractiveness of a product; „symbolic” is the reflection of product appearance in relation to its owner/user; and „semantic” is concerned with evaluating qualities like function and mode-of-use (Crilly & Clarkson 2004). In relation to this research, the application of the semantic differential method is categorised under the aspect of „semantic”, while the Room Effect is classified under „symbolic”. As cars are recognised as a „status symbol” (Davison 2004), and owning a car is known as an act of „status consumption” (O'Cass & McEwen 2004), the Room Effect is applied as a dominant method in this research, since the focus is on the effect the product has upon how people perceive its owner.

Borrowing methods from other disciplines is considered typical for research fields relating to the study of consumer behaviour. For instance, in fields such as marketing, ethnographic methods have been adapted and used by marketing researchers to understand in-depth consumer behaviour towards products. Moreover, with the advent of new technology, such as the internet, ethnographic methods have been widely used in order to revolutionise market research. In relation to this, it has been found that besides borrowing this method, a few marketing researchers have even combined ethnographic methods with online technology to produce online ethnographies. Hence, they have not only revolutionised marketing research, but also introduced new terminology to suit these two areas in combination, such as cyber ethnography (Fox & Roberts 2008) and netnography (Kozinets 2002). In the area of design, Hanington (2003) noted that it “makes sense to borrow established methods from disciplines engaged in human research, since design is fundamentally a human-centred activity” (p. 14). Moreover, he added that “methods borrowed may be appropriate for the needs of design, yet it is equally important to recognize that we have adapted them for our own purposes” (Hanington 2003 p. 14). Previous research shows that researchers, especially in the design field, have used this so called „adapted method” (Hanington 2003) in their study of human behaviour. For instance, “ethnographic methods have been applied by designers as part of their research in the design process, which shifts or even changes the role of designers and their relationship with the user” (Hummels, Redstrom & Koskinen 2007 p. 13). Besides appealing to designers, by providing a window onto the ways consumers interact with products in their everyday life (Wasson 2000), it is also considered as an alternative methodology for designers to
use, as well as enhancing their knowledge in the philosophy and method of anthropology and ethnography.

According to Almstrum et al. (2005), in borrowing methods, “it is essential that we understand the epistemology, focus, and assumptions that underpin them. It is not enough to borrow a method, without understanding how it is applied – and constrained – in its discipline of origin, and knowing how that tradition shapes the method and the evidence it can yield” (p. 192). Figure 4.1 below shows the overview of research methodology explaining the objective of each chosen methods.

<table>
<thead>
<tr>
<th>PARALLEL METHODS</th>
<th>Method I</th>
<th>Method II</th>
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<tr>
<td>Qualitative Research – Car Positioning Task</td>
<td>Semantic Differential</td>
<td></td>
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<tr>
<td>• To discover the meaning of car to user</td>
<td>Room Effect (Main Method)</td>
<td></td>
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<tr>
<td>Medium:</td>
<td>• To capture the effect the design of a car has upon perception of its owner</td>
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<tr>
<td>• Computer based</td>
<td>Five-Factor Model (FFM) of Personality</td>
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<td>(Basic platform of Questionnaire)</td>
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<td></td>
<td>• To capture the effect the car’s personality has upon perception of its owner</td>
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<td>Medium:</td>
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<td></td>
<td>• Internet based (Actual Test)</td>
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Figure 4.1 - Overview of Research Methodology *Source: author’s own

4.2.1 Semantic Differential

To design products that can meet users’ preferences for a product, it is important for designers to know how consumers perceive the product. In this context, understanding consumer perception not only covers the evaluation of the company’s existing products, but also products of their competitors. Huisman (2007) explained that in the automotive industry, this is achieved by organizing car clinics, which are in the form of surveys and interviews, in order to evaluate new models in comparison to their direct competitors. The purpose of these clinics is to identify the perceived strength and weaknesses according to the various target groups and the perception of drivers, which provides the total impression of the model (Huisman
Getting feedback from potential customers can support designers in understanding in-depth user needs. In other words, the purpose of this process is to discover the meaning of car design and the relationship between a car’s appearance and perception of the user.

In relation to this research, the Semantic Differential method was employed in order to identify this “meaning”. The literature review chapter introduces the earlier work of Osgood, who sought a practical, objective method of measuring the differences in meaning of words and concepts from different languages and cultures. He developed the classic semantic differential survey instrument, which is deceptively simple and elegant, in light of its proven effectiveness (Coates 2003). Coates (2003) argues that the Semantic Differential instrument has “turned out to be the most effective means of interpreting and comparing the emphatic expressions of products” (p. 63), and can be used as suitable data for designers in developing products that have appealing forms (Bloch 1995).

The car consumer market research approach is based on the means-end relation theory (Huisman 2007), which posits that user preferences and choices towards product are determined by their self relevancy and desirable product meanings (Jaeger & MacFie 2001 p. 190). So the Semantic Differential method is applied to assess user requirements and to establish how they perceive competing car models, in terms of physical appearance and performance in relation to styling.

A detailed explanation of the means-end relation theory by Gutman (1982) stated that “means are objects (products) or activities in which people engage. Ends are valued states of being such as happiness, security, and accomplishment” (p. 60). Therefore, a means-end relation theory is a model that seeks to explain how a product or service selection facilitates the achievement of desired end states.

Valette-Florence et al. (2003) provide another definition that “the central tenet of the means-end relation theory is that product meaning structures stored in memory consist of a chain of hierarchically related elements. The chain starts with the product attributes, and establishes a sequence of links with self concept (personal values), through the perceived consequences or benefits produced by certain attributes of the product” (p. 4).
This theory has been applied in car market research in various forms of study, such as ethnography (Stewart & Raman 2007), participatory (Dahlsten 2004), interview (Chon 2007), brain imaging (Erk et al. 2002), where the information is used to position the new model. In this case, positioning implies identifying sales and consumer targets for the new model, identifying how to differentiate the model; identifying which element of the new model to stress; and identifying how to link these elements to benefits and drivers of choice, and then deciding how to execute these processes (Huisman 2007). Moreover, the explanation in the previous chapter on product perception and product personality shows that these studies are in fact established in reference to the means-end relation theory. The difference is only in the application of methods and processes, in which the aim is to create "empathic expression" in products that satisfy users’ need. For instance, the study in design and emotions shows that the "means" to achieve this, is the product appraisal by users based on their goals. If the product suits their self concept, in terms of goals, attitude and standards (Desmet 2003), this will create happiness which is the desired "end". Moreover, "appraisal" in this context is the process of users interpreting product meanings through their emotional responses, by visual evaluation of artefacts, which later will be decoded or translated by designers in the form of design.

As for car designers, interpreting and responding to consumer feedback in a design form will need a special mode of communication: the visual, as creating aesthetic appearance, “emphasizes the need for studying those components of the product that have a specific "meaning" directly connected to the styling intent” (Catalano et al. 2007 p. 73).

In contrast, the normal practice of market research does not fit comfortably with the designer’s "visual thinking" and working method in beautifying a product. In addition, the shortcomings of traditional methods of market research, such as surveys, interviews, questionnaires and focus groups are well known (Hanington 2003) and all of these methods have proven ineffective in supplying the type of information that designers need (Abbie & John 1993).

In relation to the assessment of product meaning, a number of design researchers have modified Osgood’s classic semantic differential survey instrument to suit their own purpose. Instead of words, visual elements are incorporated in surveys. Samples provided by Berent, Iwara and Maehara (2003) and Coates (2003) show
that both have a similarity in terms of the format used (Figure 4.2). The only difference is that Coates (2003) incorporated visual elements, while Berent, Iwara and Maehara (2003) used only text for respondents to answer their survey. These differences reflect the different purposes of the testing in these studies. The research of Berent, Iwara and Maehara (2003) was intended to examine the mechanism behind the choice of script type in Japanese writing, whilst Coates (2003) focused on understanding user perception of the shapes of two different watches.

![Comparison of the results of Semantic Differential tests for Kanji, Hiragana and Katakana script by Berent et al. (2003) and product (watches) by Coates (2003)](image)

*Source: (Berent, Iwahara & Maehara 2003) and (Coates 2003)*

In other research, Antikainen et al. (2003) used a two dimensional plot visual based on semantic differential to evaluate product meaning in a range of furniture manufactured by small design companies in Finland, who were asked if they could see ways of using this technique in their design process (Figure 4.3)
4.2.2 Room Effect

This research focuses on how the perceptual process is linked to a car’s aesthetic characteristics and human personality. In other words, the research examines how cars are perceived in relation to human personality characteristics. With data obtained across individuals and products, the research aimed to uncover the relationships between the evaluation of design characteristics and the perception of product personality. This research approach can provide insights into the sources and processes behind product personality assessment.

In addition, this research approach can provide in-depth understanding of product personality assessment. The existing research into perception, concerning the investigation of product personality and human personality congruence, has used product variants from ordinary product classes as stimuli and a range of methods for collecting data, such as interview and survey. The interview in this research involves the presentation of a coloured picture of a product and a scenario that portrays the personality of a hypothetical person (Govers & Mugge 2004) to which the interviewee is invited to respond (Finch 1987). The accompanying questionnaire shows pictures of product variants as stimuli and respondents are asked to describe the personality of a stimulus based on famous people, for example the Queen,
Madonna, the Prime Minister, using personality descriptors (Govers & Schoormans 2005). There is no study that assesses the impact of the product context on the judgments made about the person seen.

In the existing automotive market research, several techniques have been incorporated in both marketing and design within the automotive industries, to better understand consumer behaviour. Most automotive companies have applied various approaches in their research, but are more inclined to use qualitative research methods, such as ethnographic methods (Chesney, Chuah & Hoffmann 2007; Dawson & Patrick 2005; Gover 2005; Hammonds 2009; Schembri 2008; Sloan 2008; Spencer 2006), listening in (Urban & Hauser 2004), participatory method (Dahlsten 2004) and story gathering (Warner 2004).

As indicated above, a common feature of these methods is that they focus upon the vehicle per se. In so doing, they overlook a key feature of products, namely the capacity of the product to confer its characteristics onto the owner. These characteristics can be overt or more subtle. In the overt category, ownership of a new Rolls Royce indicates obvious wealth, and this crosses national boundaries. In any country, such ownership confers wealth status and, by implication, success on its owner. At the top end, signals of wealth and success are apparent in ownership of a Bentley, Lamborghini or Ferrari, right down to the second level of Mercedes and BMW. Similarly at the other end of the scale, in developing nations „aspiring to succeed“ is indicated by ownership of any vehicle. It is the wide middle level that is highly complex, with a large range of competitors who may move up and down in this status area, by virtue of advertising, design or even sponsorship of motor racing events. This is a shifting area in which the majority of Western consumers operate. As such, it is highly sensitive to trends, style and technical innovation.

At a more complex level, the objects that we possess communicate aspects of our personality, group membership and aspirations. This was first articulated by Thorsten Veblen in his classic book „The Theory of the Leisure Class“ (Veblen 1899). It was Veblen who invented the term „conspicuous consumption“, and he described the role of possessions in the defining of our social identity. A later advocate was Goffman with his text, „The Presentation of Self in Everyday Life“ (Goffman 1959). This again identified the role of objects in socially positioning people, and the role of the living-room as a stage in which people performed to guests. The theatrical props were, of course, the furniture and furnishings. Empirical
Evidence exists for this (Laumann & House 1970) and theorists of the material culture fraternity have since extended it. The latest empirical manifestation is in what has been called the “Room Effect”, which was derived from the field of “Environmental Psychology”. This field of study relies on the idea that judgements of people are influenced by their surroundings, as though the environment they are in somehow becomes a part of their own attributes (Wilson & Mackenzie 2000).

Research by Canter, West & Wools in 1974 found that the characteristics of a room were transferred to their prospective occupant (Canter, West & Wools 1974). Earlier, in 1956, Maslow and Mintz observed a similar “Room Effect”, whereby the characteristics of a room impacted upon the judgements of people’s faces associated with those room (Maslow & Mintz 1956). Thus, faces in a “beautiful” room were judged higher in “energy” and “well being” than those in an “average” room, which in turn were higher than those of an “ugly” room (Wilson & Mackenzie 2000). Campbell (1979) also found an association between the design of a professor’s room and the presumed characteristics of the professor who would be found there.

Analysing the above studies shows that the surrounding environments form an enduring and central part of the impression of a person (Canter, West & Wools 1974). As stated by Goffman (1959) interior settings used by performers act as a stimuli and stage prop to make up the personal front into “appearance” and “manner”. In application to this research, “setting” of the stage prop involved a photograph of a car along-side a photograph of a man or woman who act as a performer.

In using the Room Effect method, different types of visual stimuli were used to discover how physical environment and people played a role in person perception. Although an image was used as a stimulant to gauge respondents’ judgements”, it was presented in different kinds of visual techniques and image compositions. In the three experiments carried out by Canter et al. (1974), Experiment I used monochromatic line-drawings of rooms and person. Experiment II was conducted by employing more realistic architectural stimuli colour slides of real rooms involving no people in them. In replacing people, considerable evidence of habitual use by individual was included in the slides such as coffee mugs, briefcases, Experiment III used actual photographs of people, focusing on head and shoulder positions which were superimposed upon a variety of room backgrounds (Canter, West & Wools 1974). Besides the technique of Canter, West and Wools, several other techniques
using visual stimuli were employed by different researchers, for example Campbell (1979) who used the same technique employed by Canter, West, and Wool. The photographic slide technique used in Experiment III, was followed by Wilson and Mackenzie’s experiment which used photographs of living rooms for the purpose of establishing the type of social and personal „read“ from domestic environments (Wilson & Mackenzie 2000). In this case, the visual technique is referred to as „appearance“ and „social setting“ (Goffman 1959), where the „realness“ of these two elements are significant in order to produce an accurate judgement.

The „Room Effect“ method is appropriate for discovering how physical environment plays a role in person perception (Canter, West & Wools 1974). By using a „Room Effect“ quantitative research approach, the perception of car users may be discovered and understood, ensuring a promising direction for design concepts, which will be applied in future car design and styling.

4.2.3 Five-Factor Model (FFM) of Personality

In further discussion of product personality and human personality, both can be understood in a similar way in terms of how they are perceived. According to Borkenau and Liebler (1992, 1995), research shows that human physical appearance, such as clothing, hair colour and style, and facial characteristics have a strong influence on the perception of human personality.

An analogous explanation of product design shows that product appearance is regarded as a strong element in determining the perception of product personality (Brunel & Kumar 2007; Govers, Hekkert Paul & Schoormans 2002). Here product appearance is comprised of visual aesthetic characteristics such as simplicity, harmony, balance, unity, dynamics, timeliness/fashion, and novelty. Earlier studies showed that several researchers in consumer behaviour used standardised human personality scales to assess the personality of products and brands, such as Gordon’s Personal Profile, Edward’s Personal Reference Schedule, Thurstone’s Temperament Schedule, McClosky’s Personality Inventory, Dunnette’s Adjective Checklist and Cattell’s 16-Personality Factor Inventory and Product-anchored Q-Methodology, and the California Personality Inventory, (Kassarjian 1971; Sirgy 1982). However, this method has been criticised, as it was tested and validated according to human personality, so that the validity of such personality scales to study product personality is in doubt. Therefore, there is a need for personality or
consumer behaviour researchers to develop their own personality inventory scale in order to define product personality, as pointed out by Kassarjian (1971) in his paper reviewing the application of the personality inventory to product research.

In this research, the Five Factor Model (FFM) of personality, developed by McCrae and Costa (1985), was chosen to act as a „text stimuli” for the car perception testing. As outlined in the literature review chapter, various types of the Five Factor Model (FFM) of personality have been developed by researchers, starting from Fiske (1949), to Lorr (1986), consisting of a wide range of dimensions to portray individual difference. All of these dimensions were studied and created in response to different factors, which can be measured with high reliability and validity and provide a good answer to the question of personality structure (Digman 1990). In this research, studying product perception is indirectly related to understanding the interaction between human personality and product personality, as a picture of a human and a product were incorporated in the pilot and actual test. Therefore, using the McCrae and Costa (1985) Five Factor Model (FFM) of personality in supporting the „Room Effect” method served the research purpose. This model of inventory has been proven to be affective in testing human personality. Convincingly, psychologists believe that it is the best representation of trait structure (McCrae & Costa 1997), which has been heavily influenced by previous research over the past decade (Rolland 2002). As explained in the previous chapter, the Five Factor Model (FFM) of personality has been tested in several countries and explored in different cultures, involving numbers of researchers who have specialized in personality psychology, such as Church and Katigbak (2002) - Philippines; Piedmont (2002) – Zimbabwe; Gülgoz (2002) - Turkey; Mastor et al. (2000) - Malaysia; McCormack and Mellor (2003) - Australia; Leininger (2002) - Vietnamese-American; Lodhi et al. (2002) – India; Lima (2002) – Portugal; Martin et al. (2002) – Russia, and Hřebíčková (2002) - Czech Republic, Poland, and Slovakia. As this current study involved international participants from two different countries, use of the Five Factor Model (FFM) of personality seemed appropriate, as it has been tested and proven that personality structure of people from these two countries could be described effectively (Mastor, Putai & Cooper 2000 ; McCormack & Mellor 2003).

In this area, a number of studies have been conducted by academic design researchers which have initiated interest in identifying products as personalities. Early studies by Jordan in 1997, using a technique known as Product Personality
Assignment (PPA), revealed the establishment of a number of links between aesthetic qualities of products and personality, suggesting that people prefer products that reflect their own self-personality (Jordan 2002). After the PPA was heavily criticised by designers for its terminology, as not reflecting what the “layperson” would use when describing personality, a new study was conducted by Jordan (2002) aiming to identify the terms by which non-psychologists, specifically designers, describe personality. This terminology was used as the basis for preparing a questionnaire to rate the personalities of products. Further research by Mugge et al. (2008) aimed to develop and test a product personality scale which can be used to assess product personality based on product appearance during the design process. By examining the approach of both Jordan (2002) and Mugge et al. (2008), a limitation was identified. Since both scales were developed using English and Dutch participants, it is difficult to apply them to countries in other regions, such as Asia. There is no doubt that these scales need to be translated into other languages, as the meaning of the personality descriptors developed by both researchers could be understood differently in other countries. Based on this there is a possibility that the product personality scales of both Jordan (2002) and Mugge et al. (2008) are sensitive to language differences.

In relation to the present research, the application of the five-factor model of personality has an advantage, because it had been tested earlier and proven to be effective cross-culturally. In its application to the study in product personality, past research recommended its relevancy to products and brands (Aaker 1997; Govers & Mugge 2004). Although the FFM has been tested using utilitarian products, such as a toaster (Govers & Mugge 2004), testing on symbolic products has not been conducted by any academic design researchers. For this reason, employing FFM in this research on the car, which is recognised as a highly symbolic product (Mugge, C.M. Govers & Schoormans 2008), will uncover the validity of using this approach. Moreover, this can also identify the relevancy of the FFM, as to whether it is suitable to be applied to other products that are classified in the symbolic category. As designers and users may have different perception of the meaning of product personality (Shang, Ming & Chien 2000) as well as human personality, the application of FFM in this research will be useful as a benchmark in providing guideline for designers in designing cars meaningfully. Further, selecting FFM as a
supportive method to the Room Effect was essential, as it provided reference for the researcher to form questions based on the five dimensions.

4.3 Summary

This chapter has provided an overview of the research methodology and the reasons for choosing it. In determining the best approach to the study of car perception, there was a requirement to consider the types of methods that would be likely to reveal the greatest in-depth understanding of how the car is perceived. Three methods were chosen to conduct this research, comprised of Room Effect, Five Factor Model (FFM) of personality and Semantic Differential, which were determined to be useful methods for researching product status, personality and meaning. The only factor to be considered is the format of the answering process. Since two of the chosen research methods, Room Effect and Semantic Differential were borrowed from other disciplines, the original format of the answering process was found to be unsuitable for this research. Therefore, the original format needed to be modified to suit the current research purposes, in order to determine the validity and reliability of the research findings. The following chapter will present the findings from the qualitative survey, using the visual Semantic Differential method, to analyse the participant's judgments towards the product per se.
5 QUALITATIVE SURVEY – SEMANTIC DIFFERENTIAL

5.1 Introduction

The Semantic Differential (SD) survey aimed to obtain subjective perceptions of the appearance and performance of a variety of cars. As explained in Chapter 4, this method provides useful information about product meaning. Results will be combined with the Room Effect method to strengthen the findings of this research.

The literature review in the previous chapter discussed several methods used in market research to understand human behaviour and preferences relating to products consisting of quantitative and qualitative methods. Yet neither are designed to illuminate fine distinctions amongst the visual appearance of products (Hashim et al. 2009). Given that this research considers the influence of product appearance on the perception of owners or users, these two methods cannot support this research effectively.

As befits the use of the SD instrument in the field of product design, Multi Dimensional Scaling (MDS) was adopted as a visual field format. MDS is used in market research to analyse perceptions of sets of images or entities and to understand the relations between them (e.g. products, store brands). Participants are asked to judge the similarities of the entities, and scaling procedures then transform these similarity ratings into distances. This results in the entities being positioned in a multi dimensional space (Teas & Grapentine 2004). Multi dimensional scaling has long been used in the study of product perception to explain the observed similarities and dissimilarities, or distances, amongst the investigated objects: the closer together in the space, the more similar the products (Hashim et al. 2009).
The MDS method was initially created by Young and Householder (1938), yet due to its complexity, it remained relatively unused until Torgerson (1952) revived and modernized it.

It is useful for marketers to get some feel for how their brand is positioned in the minds of consumers relative to competing brands. Consumer perceptions of products or brands and the relations between them may be understood as „mental maps“. Such a mental map is not easily visualised. The advantage of the application of MDS, therefore, is that it assists the conversion of implicit visualisation into an explicit representation, allowing marketers or designers to easily read and define the perceptual map. This can contribute to future development and improvement of the product or brand.

MDS as a visual field format to support the semantic differential method in building the multi-attribute perceptual space (Figure 5.1) can provide a tool to help designers identify the particular semantic dimensions that require improvement.

Given the objective of this qualitative research, to study consumer perceptions of car styling and performance, it is worth looking to existing research on product perception that has also made use of the Semantic Differential method and MDS to understand how these two methods have been combined. Research by Green,
Maheswari, and Raul (1969) and Petiot and Grognet (2006) most closely resemble the current method. These studies applied SD and MDS to understand consumer perception of car brands.

For Green, Maheswari, and Raul (1969) (Figure 5.2), the stimuli consisted of the names of 17 popular brands of automobiles while Petiot and Grognet (2006) (Figure 5.3) used 15 images of cars.
5.2 Participants

Participant groups from two countries participated in the study. The Australian group consisted of 8 male and female staff from Swinburne University of Technology, Melbourne, and the Malaysian group of 8 male and female staff from the Universiti Putra Malaysia, Serdang. Due to the preliminary and exploratory nature of the study, it was decided that a wider sample would not be required.

<table>
<thead>
<tr>
<th>Demographic Country</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaysia</td>
<td>8</td>
<td>100</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>5</td>
<td>62.5</td>
</tr>
<tr>
<td>Female</td>
<td>3</td>
<td>37.5</td>
</tr>
</tbody>
</table>

Table 5.1: Background characteristics of subjects – Malaysia

<table>
<thead>
<tr>
<th>Demographic Country</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>8</td>
<td>100</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>3</td>
<td>37.5</td>
</tr>
<tr>
<td>Female</td>
<td>5</td>
<td>62.5</td>
</tr>
</tbody>
</table>

Table 5.2: Background characteristics of subjects – Australia
5.3 Stimuli

Initially, the selection of stimuli was conducted through selecting and editing process. The selecting process was carried out by gathering various car brands images from the Google Image website. Then, it was edited using Adobe Photoshop CS 3 (see Figure 5.14).

Stimuli consisted of a set of ten images of cars, divided into three categories: expensive, moderate, and cheap. The expensive group included Ferrari Enzo, Mercedes Benz C-Class, BMW SUV, and Volvo S80.

![Ferrari Enzo](Carspotting.com 2006)

![Mercedes Benz C-Class](Toepke 2008)

![BMW SUV](Auto Outlet 2009)
The moderately priced car segment included cars manufactured by American and Asian owned automakers, Holden, Chrysler, Toyota, and Proton.
The cheap car category included brands originating from two Asian countries, Malaysia and China: Proton and Chery.

Table 5.3 – List of car brands, engine type and price

<table>
<thead>
<tr>
<th>Car</th>
<th>Engine</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ferrari Enzo</td>
<td>6.0-litre V12</td>
<td>AUD 1,000,000.00</td>
</tr>
<tr>
<td>Mercedes Benz C-class</td>
<td>3.0-litre DOHC V6</td>
<td>AUD 99,499.00</td>
</tr>
<tr>
<td>BMW SUV</td>
<td>3.0-litre V8</td>
<td>AUD 102,383.00</td>
</tr>
<tr>
<td>Volvo S80</td>
<td>3.2-litre</td>
<td>AUD 98,950.00</td>
</tr>
<tr>
<td>Holden Commodore</td>
<td>6.0-litre</td>
<td>AUD 42,000.00</td>
</tr>
<tr>
<td>Chrysler PT Cruiser</td>
<td>2.4-litre</td>
<td>AUD 37,690.00</td>
</tr>
<tr>
<td>Toyota Vios</td>
<td>1.5-litre</td>
<td>AUD 29,199.00</td>
</tr>
<tr>
<td>Proton Waja</td>
<td>1.6-litre</td>
<td>AUD 29,990.00</td>
</tr>
<tr>
<td>Proton Savvy</td>
<td>1.2-litre</td>
<td>AUD 12,990.00</td>
</tr>
<tr>
<td>Chery QQ3</td>
<td>1.1-litre</td>
<td>AUD 12,000.00</td>
</tr>
</tbody>
</table>
Figure 5.14: Process of stimuli selection for cars
*Source: (Google Images 2008a)
5.4 The Development of the Multi Attributes Perceptual Space and Method

A trial run was carried out during the early development. Bipolar semantic scales were selected such as Evaluation (like-dislike), Social (expensive-cheap), Potency (strong-weak), and Activity (fast-slow). The images of the selected cars were printed in colour and cut according to their shape outline and double-sided tape was applied to the back of the images so that the participants could position the images.

After the test run was completed a few problems were identified:

1) Preparation and handling
   a) Extensive hours would be required for stimuli set up – Preparing each set of 20 thumbnail size pictures was laborious. Cutting the outline and pasting the tape took approximately 25-30 minutes per set, so preparing a set for each of the 16 respondents would have taken 8 hours.

   b) Proper storage for stimuli – Given that the stimuli would consist of 320 thumbnail size images (for 16 respondents), proper storage would be necessary, as a missing picture would jeopardise the test. This was considered tedious work.

2) Execution
   a) Extensive hours for test execution – Positioning the pictures would be a lengthy process for respondents. Two tasks would be included; 1) picture positioning (Figure 5.15) and; 2) picture sticking (Figure 5.16).

![Figure 5.15: Picture positioning](image)
The pilot study test led to the conclusion that the entire process was too time consuming. Moreover, the thumbnail images could not be repositioned once pasted on the A3 paper. If the participants had any second thoughts, images could not be repositioned. Therefore, the test could result in imprecise results.

Due to the problems referred to, a decision was made to run the Semantic Differential qualitative survey using Adobe Illustrator CS3 software instead of the paper-based test (Figure 5.17). The advantages of using this software are:

1) Less time for preparation and handling of images – Images of cars could be downloaded and stored in a folder, along with the 2D multi attributes perceptual space plot.

2) Less time for test execution – Participants could easily position the images by dragging and positioning them on the 2D multi attributes perceptual space plot. Testing could be carried out using a laptop.
5.5 Method and Procedure

Participants were asked to position the car images on the 2D multi attributes perceptual space plot generated with Adobe Illustrator CS3 software. Data were collected over a four week period in Melbourne and Kuala Lumpur. Participants were approached individually and invited to take part. They were given a briefing on the objective of the qualitative survey. A laptop was used and participants were instructed to use the mouse to position the car pictures. The set of car pictures was placed at the bottom of the screen, directly under the 2D plot (Figure 5.18). Participants could view, drag, and position the cars according to their knowledge and perception of them. As a laptop screen is relatively small, the same car images were also printed in colour on A4 paper and available for use as a reference.

Participants were shown two 2D multi attributes perceptual space plots consisting of the four different bipolar semantic scales mentioned earlier (Figure 5.18 and 5.19).

Figure 5.18: Set 1 survey layout using Adobe Illustrator CS3 software together with two bipolar semantic scales – Evaluation and Social
5.6 Construction of bipolar semantic scales for car evaluation

According to existing Semantic Differential research, the use of factors and adjectives is significant in determining the meaning of products. In this context, factors and adjectives are expressed as words used to communicate impressions arising when interacting with products (Alcantara et al. 2005). Therefore, factors and adjectives should be applicable to the stimulus or product to ensure relevant research. Khalid and Helander (2004) studied the customer preferences for future electronic devices for cars, while research carried out by Voss, Spangenberg, and Grohman (2003) measured the hedonic and utilitarian dimensions of consumer attitudes toward product categories and different brands within categories. The differing products and objectives of these studies influenced the selection of factors and adjectives. For instance, Khalid and Helander (2004) included scales based on the terms cheerful – not cheerful; functional – not functional; efficient – inefficient; and amusing – not amusing. In contrast, Voss, Spangenberg, and Grohman (2003) employed more traditional bipolar scales; common – unique; traditional – fashionable; and conventional – innovative. Overall though, factors and attributes are seldom used in research relating to product perception (Karlsson, Aronsson & Svensson 2003; Shang, Ming & Chien 2000).
The objective of this research was to obtain subjective responses to the physical appearance of cars. Unlike the traditional Semantic Differential scaling techniques that are given a value in a set of five or nine, this research employed a 2D rating scale, with pairs of contrasting adjectives as poles of single scales running vertically and horizontally (Figure 5.20).

Four factors and four pairs of contrasting adjectives define the bipolar semantic scales: Evaluation (like-dislike); Social (expensive-cheap); Potency (strong-weak); and Activity (fast-slow). All these factors are relevant to the main purpose of the study. „Evaluation” was selected to investigate respondent’s explicit preferences for car designs, and „Social” to ascertain perceptions of the social value of various cars. „Potency” intended to discover respondent perceptions of car durability, while „Activity” investigated respondents understanding of car performance.

5.8 Results and Discussion

The purpose of this Semantic Differential study is to obtain subjective perceptions of the physical appearance of a range of cars. The study also intended to assess the general feasibility of this technique for gaining insight into consumer perceptions of products. According to the results, this technique is cross culturally meaningful and
effective. Moreover, a clear pattern of placements emerged that make intuitive sense.

For instance, the plots based on the Malaysian and Australian participants' perceptions showed quite similar patterns of placements in terms of the potency and activity factors (Figure 5.21/5.22); the spread within the space was smaller compared to the evaluation and social factors (Figure 5.23/5.24). This demonstrates a strong agreement between the two countries on the perception of cars in relation to potency and activity.

The luxury and small car segments were found to have almost similar patterns of placements. As for the expensive cars, the Ferrari Enzo, Mercedes Benz C-Class, Volvo S80, and BMW SUV were judged as strong, fast, expensive, and preferred, whereas the Chery QQ3 and Proton Savvy were considered slow and weak.

Malaysia exports the Proton Waja and Savvy to Australia. The Waja seems to be perceived negatively by respondents from both countries. This may be related to current problems faced by Proton, including outdated technology, a limited product line (Chrysler 2010) and uncertain product quality. In Australia, the Proton Waja was seen as an overpriced and underpowered car, which may explain its unimpressive sales record (Wilson 2004).

The Proton Savvy, on the other hand, has a bright future in Australia; it was well accepted by Australian participants and better rated in terms of the social and evaluation factors. This may relate to its retro Italian styling. Moreover, an advantage for the Savvy is the recent trend in Australia towards smaller and more fuel efficient vehicles (Bracks 2008). Unlike in Australia, the Savvy was not favoured amongst Malaysians possibly due to strong competition with the local car manufacturer, Perodua (Schweinsberg, Chrysler & Diem 2006). Interestingly, the latest car export from China, the low priced Chery QQ3, was perceived as weak, slow, cheap, and disliked by both Malaysian and Australian participants.
Figure 5.21: Potency (strong-weak) and Activity (slow-fast) – Malaysian participants
Figure 5.22: Potency (strong-weak) and Activity (slow-fast) – Australian participants
Figure 5.23: Evaluation (like-dislike) and Activity (cheap-expensive) – Malaysian participants
Figure 5.24: Evaluation (like-dislike) and Activity (cheap-expensive) – Australian participants
5.5 Summary

This chapter reported the results of a qualitative survey that used the Semantic Differential technique to study perceptions of cars. This technique combined Osgood’s Semantic Differential instrument with Multi Dimensional Scaling (MDS) as a visual field format. This new method was found useful to assess product meanings cross culturally. Interesting results were achieved from the Malaysian and Australian groups regarding their perceptions of the various car brands. This method should be applicable to other product categories.

Using Illustrator software to perform the survey meant that it could be completed in less time; the participant could quickly “click and grab” individual products and locate them within a digital space on a computer screen. The only limitation is that the software cannot identify the position of each product and provide numerical coordinates corresponding to the factors underlying the space. If this could be done, the numerical coordinates could be linked to statistical packages such as SPSS (Statistical Package for the Social Sciences). This capability, along with the graphic representations shown earlier, would enable more specific questions to be answered.
6 QUANTITATIVE SURVEY – PILOT TEST (PRODUCT EFFECT)

6.1 Introduction

This chapter presents the preliminary stage of a quantitative survey of Malaysian and Australian participants, validating the Room Effect method on cars. This stage was undertaken as a pilot study to be used in the formulation of a detailed design questionnaire.

Market research in the automotive industry focuses solely on the vehicle without considering how its owner is perceived. The literature review discussed a phenomenon found in studies in the field of environmental psychology called the Room Effect, whereby judgements of people are influenced by their surroundings. Homes and interior products usually reflect the status of a person and influence the judgements of others towards that person. Therefore, this method was selected in order to see how car appearance effects the judgements of others towards a person.

In order to identify whether the Room Effect applies to cars, and, if so, whether this effect is differentiated according to culture or gender, a pilot test was carried out using visual stimuli. The visual layout followed the original Room Effect study.

The results of the survey were analyzed using SPSS software. Ethics approval was granted by the Swinburne's Human Research Ethics Committee (SUHREC).

6.2 Participants and Procedure

Two participant groups were used. The first group comprised first year Film and Television students from Swinburne University of Technology, Melbourne, Australia (n = 68) with an age range of 18 to 42 years. The second group comprised first year Faculty of Accounting students from Universiti Teknologi MARA, Sungai Petani, Malaysia (n = 80) with an age range of 19 to 38 years. The groups were selected on
the basis of being equivalent in age and education level (Wilson & Mackenzie 2000). It was intended that the groups should represent non-design backgrounds. Table 6.1 and 6.2 summarises the demographic details of the participant groups.

Table 6.1: Background characteristics of subjects – Australia

<table>
<thead>
<tr>
<th>Country</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>68</td>
<td>100</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
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<th>Percentage</th>
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</thead>
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<td>67.6</td>
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</table>

<table>
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<tr>
<td>42</td>
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<td>1.5</td>
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</table>

Table 6.2: Background characteristics of subjects – Malaysia

<table>
<thead>
<tr>
<th>Country</th>
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<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaysia</td>
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</tr>
</tbody>
</table>

<table>
<thead>
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<th>Percentage</th>
</tr>
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<td>13.8</td>
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<td>Female</td>
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<td>86.2</td>
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</tbody>
</table>

<table>
<thead>
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<th>Age</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
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<td>2.5</td>
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<tr>
<td>20</td>
<td>71</td>
<td>88.8</td>
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<tr>
<td>21</td>
<td>3</td>
<td>3.8</td>
</tr>
<tr>
<td>22</td>
<td>3</td>
<td>3.8</td>
</tr>
<tr>
<td>38</td>
<td>1</td>
<td>1.1</td>
</tr>
</tbody>
</table>
6.3 Stimuli

The stimulus materials were photographic images of both people and cars. This followed the format of Canter, West, and Wools (1974) Room Effect study that used head-and-shoulder photographs of people against different room settings mentioned in Chapter 3 and 4.

The present research used head-and-shoulder photographic images of people (Australian and Malaysian, male and female models) together with photographs of cars (Mercedes Benz and Proton models) as background. Both people and car images were chose through selecting and editing process which was carried out earlier (Figure 6.1 and Figure 6.2). The human models were positioned similarly to the vehicle, and the vehicles were digitally modified to be as similar in size, orientation, and colour as possible. Adobe Photoshop CS3 was used. The eight compositions are given in Figure 6.3.
Figure 6.1: Process of stimuli selection for people

*Source: (Getty Images 2008) and (Istockphoto 2008)
Figure 6.2: Process of stimuli selection for cars
*Source: (Google Images 2008b)
Figure 6.3: Stimulus material
6.3.1 People
Considerable effort went into finding two pairs of Malaysians and Australians of comparable age and looks. Neutral facial expression was the target, with an absence of facial accessories such as glasses and earrings. As glasses and earrings can be categorized as products of status enhancement, these multiple dress cues can influence the impressions formed of participants (McKeachie 1952; Thornton 1944). Casual clothing rather than status enhancing business attire was chosen to preclude any potential confounding of attractiveness ratings. No other property cues were present.

6.3.2 Car Models
In order to test for possible effects, products were paired. These consisted of a Mercedes Benz S-Class and a Proton Waja, representing the high and low end of the market. The rationale for choosing these cars was that if a product effect failed to emerge at these extremities, it was unlikely to emerge with more similar cars. Adobe Photoshop CS3 was used to construct the stimuli.

6.4 Questionnaire
Two sets of questions were employed. The first set focused upon essentially physical and demographic characteristics (Table 6.3). The intention was to identify whether the appearance of the car confers characteristics onto the person pictured with the car.

<table>
<thead>
<tr>
<th>Theme</th>
<th>Question/Item</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical and Demographic Characteristics</td>
<td>Q1. How tall do you think he/she is? (in cm)</td>
<td>Multiple choice</td>
</tr>
<tr>
<td></td>
<td>Q2. How heavy do you think he/she is? (in kg)</td>
<td>Multiple choice</td>
</tr>
<tr>
<td></td>
<td>Q3. How old do you think he/she is?</td>
<td>Open-ended</td>
</tr>
<tr>
<td></td>
<td>Q4. What level of education did he/she achieve?</td>
<td>Interval scales</td>
</tr>
<tr>
<td></td>
<td>Q5. What do you think his/her annual income will be?</td>
<td>Interval scales</td>
</tr>
</tbody>
</table>

Table 6.3: Questionnaire formation – Physical and demographic characteristics

The second set of questions focused upon personality characteristics. These employed eighteen scales derived from the standard Five Factor Model (FFM) of
personality covering Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience (McCrae & John 1992) (Table 6.4).

<table>
<thead>
<tr>
<th>Extraversion</th>
<th>Agreeableness</th>
<th>Conscientiousness</th>
<th>Neuroticism</th>
<th>Openness to Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masculine / Feminine</td>
<td>Friendly</td>
<td>Positive Attitude</td>
<td>Unstable</td>
<td>Creative</td>
</tr>
<tr>
<td>Elegant</td>
<td>Trustworthy</td>
<td>Reliable</td>
<td>Anxious</td>
<td>Stylish</td>
</tr>
<tr>
<td>Sporty</td>
<td>Generous</td>
<td>Efficient</td>
<td>Vulnerable</td>
<td>Open to New Ideas</td>
</tr>
<tr>
<td>Attractive</td>
<td>Kind</td>
<td>Organized</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 6.4: Types of personality adjectives used in the questionnaire based on the basic dimensions of the Five Factor Model (FFM) of personality

The questions were framed as statements to which the participants indicated level of disagreement/agreement.

The questions were arranged in a random order to counter a possible „consistency effect“. Randomly interspersed items required participants to think about each item more than would be the case if they were in groups of similar items (Ramirez & Straus 2006).

Each question was accompanied by a nine-point Lickert scale to indicate the respondents’ level of agreement/disagreement (Quester, Karunaratna & Goh 2000). This uniformity has a number of advantages, enabling standard statistical procedures such as ANOVA to be performed. Malaysian participants received a Malay language version of the questionnaire while Australian participants received an English language version. Table 6.5 lists the questions:
<table>
<thead>
<tr>
<th>Theme</th>
<th>Question/Item</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conscientiousness</td>
<td>Q6. He/She looks like he/she has a positive attitude to life.</td>
<td>9-point scale</td>
</tr>
<tr>
<td>Openness to Experience</td>
<td>Q7. He/She is creative.</td>
<td>9-point scale</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>Q8. He/She looks friendly.</td>
<td>9-point scale</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>Q9. He/She looks unstable.</td>
<td>9-point scale</td>
</tr>
<tr>
<td>Extraversion</td>
<td>Q10. He/She looks masculine/feminine.</td>
<td>9-point scale</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>Q11. He/She looks trustworthy.</td>
<td>9-point scale</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>Q12. He/She looks anxious.</td>
<td>9-point scale</td>
</tr>
<tr>
<td>Extraversion</td>
<td>Q13. He/She is elegant.</td>
<td>9-point scale</td>
</tr>
<tr>
<td>Extraversion</td>
<td>Q14. He/She looks sporty.</td>
<td>9-point scale</td>
</tr>
<tr>
<td>Openness to Experience</td>
<td>Q15. He/She looks stylish.</td>
<td>9-point scale</td>
</tr>
<tr>
<td>Openness to Experience</td>
<td>Q16. He/She looks open to new ideas.</td>
<td>9-point scale</td>
</tr>
<tr>
<td>Extraversion</td>
<td>Q17. He/She is attractive.</td>
<td>9-point scale</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>Q18. He/She appears generous.</td>
<td>9-point scale</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>Q19. He/She looks reliable.</td>
<td>9-point scale</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>Q20. He/She looks efficient.</td>
<td>9-point scale</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>Q21. He/She looks organized.</td>
<td>9-point scale</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>Q22. He/She appears kind.</td>
<td>9-point scale</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>Q23. He/She looks vulnerable.</td>
<td>9-point scale</td>
</tr>
</tbody>
</table>

Table 6.5: Questionnaire formation – Five Factor Model (FFM) of personality
6.5 Exploratory Factor Analysis

SPSS was used for the statistical analyses. Initially, Exploratory Factor Analysis was performed to investigate whether factors might exist (Brace, Kemp & Snelgar 2006). The objective was to reduce many variables to a few factors and to establish the underlying relationships between groups of questions. Interest also lay in whether factors extracted would correspond with the Five Factor Model (FFM) of personality.

The Exploratory Factor Analysis used Principal Axis Factoring (PAF) with Direct Oblimin rotation. The Kaiser-Meyer-Olkin (KMO) obtained was .904, indicating a good correlation amongst variables. Results from a Bartlett Test of Sphericity achieved an acceptable level of >.001. A value of 5426.0 for a Bartlett chi-square, confirmed that the variables were inter-correlated.

Once the extraction of factors was completed, the table of „Communalities“ indicated how much of the variance in each of the original variables could be explained by the extracted factors. Higher communalities are needed that exceed .2 for each variable. This was achieved (Table 6.6). In the analysis, stylish (.759) achieves the highest communality while the lowest communality is for vulnerable (.327).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Initial</th>
<th>Extraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>.308</td>
<td>.517</td>
</tr>
<tr>
<td>Weight</td>
<td>.358</td>
<td>.546</td>
</tr>
<tr>
<td>Post_Attd</td>
<td>.571</td>
<td>.549</td>
</tr>
<tr>
<td>Friendly</td>
<td>.625</td>
<td>.657</td>
</tr>
<tr>
<td>Unstable</td>
<td>.289</td>
<td>.433</td>
</tr>
<tr>
<td>Masculine_Feminine</td>
<td>.351</td>
<td>.317</td>
</tr>
<tr>
<td>Trustworthy</td>
<td>.601</td>
<td>.598</td>
</tr>
<tr>
<td>Anxious</td>
<td>.294</td>
<td>.441</td>
</tr>
<tr>
<td>Elegant</td>
<td>.655</td>
<td>.747</td>
</tr>
<tr>
<td>Sporty</td>
<td>.395</td>
<td>.386</td>
</tr>
<tr>
<td>Stylish</td>
<td>.669</td>
<td>.759</td>
</tr>
<tr>
<td>New_Ideas</td>
<td>.612</td>
<td>.601</td>
</tr>
<tr>
<td>Attractive</td>
<td>.619</td>
<td>.661</td>
</tr>
<tr>
<td>Generous</td>
<td>.661</td>
<td>.684</td>
</tr>
<tr>
<td>Reliable</td>
<td>.631</td>
<td>.604</td>
</tr>
<tr>
<td>Organized</td>
<td>.506</td>
<td>.455</td>
</tr>
<tr>
<td>Kind</td>
<td>.668</td>
<td>.709</td>
</tr>
<tr>
<td>Vulnerable</td>
<td>.218</td>
<td>.327</td>
</tr>
</tbody>
</table>

Table 6.6: Communalities extraction
In order to confirm the numbers of factors a Scree Plot was used. The result showed that it did not support the Five Factor Model (FFM) of personality proposed at the initial stage. However, it did support a four-factor solution. Figure 6.4 shows the factor analysis output and Scree Plot for the eigenvalues. Furthermore, the loadings on the 1st factor was high compared to the 2nd, 3rd, and 4th (Figure 6.4).

Table 6.7: Total Variance Explained

<table>
<thead>
<tr>
<th>Factor</th>
<th>Initial Eigenvalues</th>
<th>Extraction Sums of Squared Loading</th>
<th>Rotation Sums of Squared Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>% of Variance</td>
<td>Cumulative %</td>
</tr>
<tr>
<td>1</td>
<td>6.910</td>
<td>38.390</td>
<td>38.390</td>
</tr>
<tr>
<td>2</td>
<td>1.823</td>
<td>10.127</td>
<td>48.517</td>
</tr>
<tr>
<td>3</td>
<td>1.724</td>
<td>9.575</td>
<td>58.092</td>
</tr>
<tr>
<td>4</td>
<td>1.361</td>
<td>7.563</td>
<td>65.656</td>
</tr>
<tr>
<td>5</td>
<td>.806</td>
<td>4.475</td>
<td>70.131</td>
</tr>
<tr>
<td>6</td>
<td>.782</td>
<td>4.342</td>
<td>74.473</td>
</tr>
<tr>
<td>7</td>
<td>.660</td>
<td>3.669</td>
<td>78.142</td>
</tr>
<tr>
<td>8</td>
<td>.550</td>
<td>3.055</td>
<td>81.197</td>
</tr>
<tr>
<td>9</td>
<td>.505</td>
<td>2.805</td>
<td>84.002</td>
</tr>
<tr>
<td>10</td>
<td>.462</td>
<td>2.565</td>
<td>86.568</td>
</tr>
<tr>
<td>11</td>
<td>.416</td>
<td>2.314</td>
<td>88.881</td>
</tr>
<tr>
<td>12</td>
<td>.363</td>
<td>2.015</td>
<td>90.896</td>
</tr>
<tr>
<td>13</td>
<td>.333</td>
<td>1.852</td>
<td>92.748</td>
</tr>
<tr>
<td>14</td>
<td>.300</td>
<td>1.669</td>
<td>94.416</td>
</tr>
<tr>
<td>15</td>
<td>.285</td>
<td>1.582</td>
<td>95.998</td>
</tr>
<tr>
<td>16</td>
<td>.271</td>
<td>1.504</td>
<td>97.502</td>
</tr>
<tr>
<td>17</td>
<td>.238</td>
<td>1.323</td>
<td>98.825</td>
</tr>
<tr>
<td>18</td>
<td>.212</td>
<td>1.175</td>
<td>100.000</td>
</tr>
</tbody>
</table>

Extraction Method: Principal Axis Factoring

a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.
The four possible factors were interpreted using pattern matrix. To ensure a strong correlation, items that scored .5 or higher were included in the factor. Factor scores with such loading ranged between .5 and .9. The four possible factors were comprised of 7, 6, 3, and 2 scales respectively (Table 6.8).

<table>
<thead>
<tr>
<th>Pattern Matrix</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factor</strong></td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>Kind</td>
</tr>
<tr>
<td>Generous</td>
</tr>
<tr>
<td>Friendly</td>
</tr>
<tr>
<td>Trustworthy</td>
</tr>
<tr>
<td>Reliable</td>
</tr>
<tr>
<td>New_Ideas</td>
</tr>
<tr>
<td>Pos_Attd</td>
</tr>
<tr>
<td>Stylish</td>
</tr>
<tr>
<td>Elegant</td>
</tr>
<tr>
<td>Attractive</td>
</tr>
<tr>
<td>Sporty</td>
</tr>
<tr>
<td>Masculine_Feminine</td>
</tr>
<tr>
<td>Organized</td>
</tr>
<tr>
<td>Anxious</td>
</tr>
<tr>
<td>Unstable</td>
</tr>
<tr>
<td>Vulnerable</td>
</tr>
<tr>
<td>Height</td>
</tr>
<tr>
<td>Weight</td>
</tr>
</tbody>
</table>


Table 6.8: Pattern Matrix

The internal consistency of each of the four factors was measured using Cronbach’s Alpha. Alpha coefficients >.70 were treated as satisfactory (Bryman 2001). The three factors (except physical attributes) were labelled according to the common features of each factor that refers to human personality: Factor 1 – Personality, Factor 2 – Appearance, and Factor 3 – Neuroticism. In relation to the Five Factor Model (FFM) of personality, only neuroticism corresponded in this test.

The results presented in Table 6.9 indicate that two factors, personality and appearance, produced high alpha coefficients, ranging from .864 to .916. Because the neuroticism factor, with an alpha value of .645, was just below the satisfactory level, it was considered to be an acceptable reliability coefficient. As the alpha value was set at .70, the physical attributes factor with a value of .524 was below an acceptable reliability coefficient; therefore, only three factors, personality, appearance, and neuroticism were tested. In order to describe the shape and symmetry of the distributions of scores, tests of Skewness and Kurtosis were.
carried out. The results show the skewness coefficient for appearance: $\sqrt{\beta_1} = .072$; neuroticism: $\sqrt{\beta_1} = .142$ and kurtosis coefficient for personality: $\beta_2 = .032$ respectively, indicating that a normal distribution was effectively attained.

<table>
<thead>
<tr>
<th>Factors</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Cronbach’s Alpha</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personality</td>
<td>592</td>
<td>1.00</td>
<td>9.00</td>
<td>5.5075</td>
<td>1.51690</td>
<td>.916</td>
<td>-.469</td>
<td>.032</td>
</tr>
<tr>
<td>Kind+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generous+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friendly+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trustworthy+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+Reliable+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Ideas+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>Positive Attitude</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appearance</td>
<td>592</td>
<td>1.00</td>
<td>9.00</td>
<td>4.6706</td>
<td>1.65367</td>
<td>.864</td>
<td>.072</td>
<td>.434</td>
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<tr>
<td>Stylish+</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elegant+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attractive+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sporty+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Masculine/ Feminine+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>Organised</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neuroticism</td>
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<td>1.00</td>
<td>8.33</td>
<td>4.3423</td>
<td>1.60217</td>
<td>.645</td>
<td>.142</td>
<td>-.508</td>
</tr>
<tr>
<td>Anxious+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unstable+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vulnerable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Attributes</td>
<td>537</td>
<td>1.50</td>
<td>5.00</td>
<td>3.4804</td>
<td>.50565</td>
<td>.524</td>
<td>-.237</td>
<td>.417</td>
</tr>
<tr>
<td>Weight+</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valid N (listwise)</td>
<td>537</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 6.9: Descriptive Statistics – factor reliability

The Exploratory Factor Analysis reduced the 18 variables to four factors. These consisted of personality, appearance, neuroticism, and physical attributes together with two excluded variables, age and annual income, which were used as dependent variables in the next statistical analysis employing a mixed ANOVA method. Since the variables of weight and height in the physical attributes factor produced a low alpha coefficient, both variables were tested separately.

6.6 Mixed ANOVA Analysis

In order to test the four independent variables a mixed ANOVA was performed. This involved both within-subjects variables and between-subjects factors (Brace, Kemp & Snelgar 2006). The intention was to test for the level of influence each had upon perception. Within-subjects factors were included in the analysis; car (Mercedes
Benz and Proton) and model gender (male and female), as well as two between-subjects factors; respondent’s gender (male and female) and country (Australia and Malaysia). Table 6.10 shows the significant main effects and interactions obtained.

<table>
<thead>
<tr>
<th>FACTORS</th>
<th>Personality</th>
<th>Appearance</th>
<th>Neuroticism</th>
<th>Height</th>
<th>Weight</th>
<th>Age</th>
<th>Annual Income</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main Effect</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Car</td>
<td>0.022</td>
<td>0.000</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model Gender</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.024</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Two Way Interactions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Car x Country</td>
<td>0.018</td>
<td>0.046</td>
<td>0.002</td>
<td>0.042</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model Gender x Country</td>
<td>0.000</td>
<td>0.000</td>
<td>0.029</td>
<td>0.000</td>
<td>0.039</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model Gender x Respondent’s Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Car x Model Gender</td>
<td></td>
<td></td>
<td></td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 6.10: Mixed ANOVA results, significant main effects and interactions

### 6.6.1 Factor 1: Personality

Results for the Personality factor show significant interactions between car and country ($F(1, 144) =5.730, p=.018, \text{partial eta squared} =.038$) and model gender and country ($F(1, 144) =17.937, p=.000, \text{partial eta squared} =.111$) (Table 6.10).

Figure 6.5 shows an interaction between car and country. The Australian participants favoured the model appearing with the Proton over the model appearing with the Mercedes Benz, while the Malaysian participants rated the model with the Mercedes Benz slightly more favourably than the model with the Proton.
Figure 6.5: Repeated measures results for personality – car and country

Figure 6.6 indicates that the Australian participants perceived the female model more favourably than the male model, while the Malaysian participants rated the female model only slightly more favourably than the male model.
6.6.2 Factor 2: Appearance

Results for the Appearance factor show significant interactions between car and country (F (1, 144) = 4.055, p=0.046, partial eta squared =.027) and highly significant interactions between model gender and country (F (1, 144) = 17.923, p=0.000, partial eta squared =.111).

Figure 6.7 indicates that the Malaysian and Australian participants perceived the model appearing with the Mercedes Benz more favourably than the model appearing with the Proton. Notably, the Malaysian participants rated the models with the Mercedes Benz much higher than the model with the Proton compared to the Australian participants.

Figure 6.7: Repeated measures results for appearance - car and country

Figure 6.8 indicates that the Australian participants perceived the female model much more favourably than the male model. The Malaysian participants rated the female model only slightly higher than the male model.
6.6.3 Factor 3: Neuroticism

Results for the Neuroticism factor show no significant interactions between car and country (F (1, 144) = .014, p = .905), car and respondent’s gender (F (1, 144) = 1.605, p = .207), model gender and country (F (1, 144) = 2.006, p = .087), model gender and respondent’s gender (F (1, 144) = .757, p = .386), and car and model gender (F (1, 144) = .008, p = .927).

6.6.4 Height

Results for height show significant interactions between car and country (F (1, 144) = 9.804, p = .002, partial eta squared = .064), model gender and country (F (1, 144) = 4.854, p = .029, partial eta squared = .029), and car and model gender (F (1, 144) = 37.963, p = .000, partial eta squared = .209).

Figure 6.9 indicates that the Malaysian participants judged the model appearing with the Mercedes Benz as taller than the model appearing with the Proton, while the Australian participants rated the model with the Mercedes Benz as only slightly taller than the model with the Proton.
Figure 6.10 shows an interaction between country and model gender. The Malaysian participants rated the male model as much taller than the female model. The Australian participants judged the male model as only slightly taller than the female model.
Figure 6.11 indicates that the male models with the Mercedes Benz were seen as much taller than the male models with the Proton. As for the female models, the results indicate no effect on perception of height with either the Mercedes Benz or the Proton.

6.6.5 Weight

Results for weight show significant interactions between model gender and country (F (1, 144) =27.144, p=.000, partial eta squared =.159).

Figure 6.12 show that both Australian and Malaysian participants perceived the male models as much heavier than the female models. The difference between the Australians and Malaysians lay in their absolute values of weight.
6.6.6 Age

Results for age show significant interactions between car and country ($F (1, 144) = 4.218, p = .042, \text{partial eta squared} = .028$) and model gender and country ($F (1, 144) = 4.338, p = .039, \text{partial eta squared} = .029$).

Figure 6.13 shows an interaction between car and country in relation to age. The Australian participants perceived the models appearing with the Mercedes Benz as older than the model appearing with the Proton, while for the Malaysian participants, the models with the Mercedes Benz appeared younger than the models with the Proton.
Figure 6.13: Repeated measures results for age – car and country

Figure 6.14 shows an interaction between model gender and country. The Malaysian participants judged the male model as much younger than the female model while the Australian participants perceived the male model as only slightly younger than the female model.
6.6.7 Annual Income

Results for annual income show significant interactions between car and model gender \((1, 144) = 27.979, p = .000, \text{partial eta squared} = .163\).

Figure 6.15 show that participants rated the male model appearing with the Mercedes Benz as having a higher annual income than the male models with the Proton, while the female models with the Proton were perceived as having a higher annual income than the female models with Mercedes Benz.

![Figure 6.15: Repeated measures results for annual income – car and model gender](image)

6.7 Discussion

The intention of this pilot study was to investigate the possible carry-over of the Room Effect to products: in other words, is there a Product Effect? The results prove confirmatory. Given the sample size it was not anticipated that major differences would occur. However, highly significant differences were observed for some of the measures used based on the two sets of questionnaires, referring to physical and demographic characteristics, and the Five Factor Model (FFM) of personality respectively, with indications of strong cross-cultural and gender agreement for some and less for others.

The results show differences between the perceptions of participants based on the type of car. The overall results from respondents indicate that models appearing with the Mercedes Benz were rated more favourably than those appearing with the Proton. More specifically, the within and between car and country interactions
indicate that models appearing with the Mercedes Benz were perceived more favourably by the Malaysian participants in terms of personality, appearance, height and age while the Australian favours only appearance and height.

In Malaysia, cars are considered a potent symbol of social status and identity (Talib 2000) that differentiates social status. For the Malaysian sample, the Mercedes Benz is considered an expensive brand of car normally owned by rich people, mainly businessmen (Talib 2000). It is considered the number one luxury passenger car in Malaysia (Say 2008). Similarly within Australia, Mercedes Benz is considered a „top end“ luxury car, in competition with car manufacturers such as Aston Martin, BMW, Bentley, Ferrari, Jaguar, Lamborghini, Lexus, Lotus, Maserati, Maybach, Morgan, Porsche and Rolls Royce (James 2007).

The car effect seems differentiated not only by country but also by model gender. A strong car effect on the perception of the height and annual income of the male model occurred, with the male model being perceived as taller with the Mercedes Benz and with a higher annual income. It is well established that taller adults are perceived to hold jobs of higher status (Case & Paxson 2006); height confers economic and social advantage. That respondents from both countries observed the male model with the Mercedes Benz as taller points to an association of perceived height with status symbols. For the female models, the car they appeared with had no effect on perceptions of their height, suggesting that the association between height and social status, possibly linked by perceptions of income, holds only for males. This is supported by research by Dunn (2010), which contends that male attractiveness can be enhanced experimentally by manipulating status using luxury motor-cars which can be related, in this case, to the model appearing with the Mercedes Benz. Why the female model appearing with the Mercedes Benz was perceived as having a lower annual income than the female model with the Proton is an interesting question, given that the Mercedes Benz is a much more expensive car than the Proton. A possible explanation is that respondents believe that a woman would not purchase a Mercedes Benz car herself, but may purchase a Proton, implying that a woman with a Mercedes Benz is more likely to be perceived as coming from a well-off family or having a wealthy husband, rather than a high annual income of her own.
6.8 Summary

Overall, the results of the pilot test show that the Room Effect can be generalised to products. The results indicate a distinct Product Effect, and one subject to both nationality and gender differences.

The next stage of the research is to obtain a much larger sample of participants. This will involve an international survey using internet facilities that have been developed in-house. With a larger sample the intention is to test for possible gender and cultural differences, and to construct a more sophisticated statistical model of the outcomes.
7 QUANTITATIVE SURVEY – ACTUAL TEST (PRODUCT EFFECT)

7.1 Introduction

The previous pilot test served two purposes. First, it verified the validity of the Room Effect method and whether it can be applied to a product perception study. It was important to verify the suitability of the Room Effect method before proceeding to the actual test and the associated larger sample. Secondly, it established the differences of the cross-cultural perceptions of cars between the Australian and Malaysian participants. As the Room Effect method has not been widely tested on products, it was also important to test the design of the questionnaires through the pilot study. Using this process the design could be adjusted if anything was missing, or not working, before it was implemented in the final study.

Based on the above, an overall positive result was achieved, with the Room Effect method found to be suitable for use with cars. This result was attributed to the similarity of social interpretations between room interiors and cars, with cars considered as tangible products that reflect the owner’s social status and identity (Talib 2000). In addition, this method was able to identify the cross-cultural perceptions towards the cars. As mentioned in Chapter 6, the Mercedes Benz was seen in a positive light by both Australian and Malaysian participants, as compared to the Proton.

Although the overall result was positive, there were a few minor adjustments made for the final actual survey based on the pilot study results. Therefore, this chapter will outline the following:

i) The aim and purpose of the actual survey;

ii) The adjustments made to the actual survey based on the pilot test results; and

iii) The results of the actual survey, along with discussion of these results.
7.2 Mode of Survey, Participants and Procedure

7.2.1 Mode of Survey

The pilot test was carried out on a small scale, with groups being selected for convenience and accessibility. In contrast, the actual test aimed for a larger sample size in order to validate the Room Effect method. According to Sarmukaddam and Garad (2004) the size of the sample should be large enough to enable the researcher to detect important findings. Therefore, in order to obtain a larger sample, extensive discussion was carried out to finalise the mode of survey for the actual test. “Modes” in this sense refers to the method used either to contact, or to gain data from survey respondents. This can involve technologies such as mail, phone, fax, and the internet.

There are basically three aspects to consider when deciding what survey mode to use; time, money, and the type of respondents required. As one of the research intentions was to focus on cross-cultural perceptions, respondents from other countries were required. In addition, there was a potential large sample size to contend with. Moreover, the pilot test saw extensive time taken administrating the questionnaire and as it was conducted in Australia and Malaysia high expenses in terms of transportation (public transport and air fares) and colour printing (592 sets of questions for 148 students) were incurred. Also, the process of entering the data in SPSS software was meticulous and involved extensive time in order to avoid making errors. As such, whilst bearing in mind the above constraints and requirements, and the need to produce the best possible data it was decided that an online survey was the best survey mode to utilise.

Due to the tremendous increase in internet use and computer-mediated communication the use of online surveys is increasingly common in research. This has presented scholars with new challenges in applying traditional methods of survey to the study of consumer behaviour (Wright 2005). The benefit of conducting surveys online is that the format of the questionnaire and corresponding results can be the same as traditional postal surveys, with the added advantage of speedy distribution (Taylor 2005). In addition, online surveys provide easy access to unique populations that could otherwise prove difficult to reach, and more importantly are more time efficient and cost effective than traditional postal surveys (Wright 2005).
In obtaining larger samples, time is another issue that should be considered by the researcher. Using the traditional survey approach is time consuming for the small number of participants reached. In contrast, an online survey allows researchers to reach thousands of people from a common group in a short amount of time, despite possibly being separated by great geographic distances (Garton, Haythornthwaite & Wellman 1998). With this research targeting a larger sample, it was hoped that the online survey would save time by allowing the researcher to collect a large amount of data rapidly while they pursued other tasks.

Another important matter considered for this actual test was cost effectiveness. According to Wright (2005), using paper surveys tends to be costly, even for a relatively small sample, with the costs of a traditional large-scale survey using mailed questionnaires potentially being enormous. The use of online surveys circumvents this problem by eliminating the need of paper and other costs such as travelling expenses (Llieva, Baron & Healey 2002). Furthermore, online survey creation software packages provide a variety of templates to design and conduct questionnaires as well as choices for exporting data to statistical software packages such as SPSS which would lessen the process of data entering (Wright 2005). As international participants were required for this actual survey it was foreseen that it would be expensive to conduct the survey using traditional approaches, due to travel costs. In addition, there would be the printing costs, as the research is focused on the perceptions towards the design and styling of cars colour printing would have been necessary to ensure consistency and accuracy of results. Therefore, using an online survey was the optimal solution for this research.

Since students were chosen to be participants for the actual test survey, the online survey was conducted through Swinburne University’s website and included in the Faculty of Design’s webpage under the online tutorial section. Swinburne University’s website was an ideal place to conduct the actual survey as the website is often visited by local and international students. The only issue to arise by conducting the survey online was to find a web designer to develop the design and layout of the online survey, as the researcher had no expertise in this area. This can be regarded as a design management task in which after defining a design problem, the researcher/designer has to find the most suitable person to solve it, both on time and within budget (Farr 1965). A web designer was appointed to develop the design/layout of the questionnaire, whilst at the same time providing a way to export
the results from the online survey to SPSS software. After six months of design development, including some minor adjustments to the text, pictures, and layout, the actual survey was carried out on Swinburne University’s website.

7.2.2 Participants and Procedure

Many participant groups from various countries took part in this study. As expected, the number of participants increased from the pilot study due to the number of local and international students who visit Swinburne University’s website. Table 7.1 summarises the demographic details of the participant groups. In this, test countries that achieved more than two per cent of the total sample were considered as significant while the “others” category represents a group of 97 countries who individually achieved less than two per cent of the total sample.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>810</td>
<td>78%</td>
</tr>
<tr>
<td>Female</td>
<td>235</td>
<td>22%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 20</td>
<td>111</td>
<td>11%</td>
</tr>
<tr>
<td>20 - 29</td>
<td>522</td>
<td>49%</td>
</tr>
<tr>
<td>30 - 39</td>
<td>251</td>
<td>24%</td>
</tr>
<tr>
<td>40 - 49</td>
<td>111</td>
<td>11%</td>
</tr>
<tr>
<td>50 - 59</td>
<td>36</td>
<td>3%</td>
</tr>
<tr>
<td>60 or above</td>
<td>22</td>
<td>2%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>17%</td>
</tr>
<tr>
<td>India</td>
<td>15%</td>
</tr>
<tr>
<td>United States</td>
<td>15%</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>7%</td>
</tr>
<tr>
<td>Singapore</td>
<td>4%</td>
</tr>
<tr>
<td>Brazil</td>
<td>4%</td>
</tr>
<tr>
<td>Canada</td>
<td>4%</td>
</tr>
<tr>
<td>Mexico</td>
<td>3%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>2%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>2%</td>
</tr>
<tr>
<td>Others</td>
<td>29%</td>
</tr>
</tbody>
</table>

Table 7.1: Background characteristics of subjects – various countries

As stated previously the actual test survey was carried out on Swinburne University’s Faculty of Design website, as part of the tutorial section. This was considered an appropriate place to house the survey as it was a section of the
website that was continuously being visited by people from all over the world. It provides free tutorials for design programs such as Adobe Flash, Maya, Adobe Photoshop, and Adobe Illustrator (Swinburne University of Technology 2009). For instance, Swinburne University’s Faculty of Design free tutorial section was rated as one of the top sites for Maya 3D animation software (Xmarks 2010).

When the web visitors intend to learn using the free tutorials from design softwares, automatically there will be a pop-up window giving them options as to whether to participate in the actual survey. If they agreed to participate in the survey a set of questionnaires would then appear on the screen which would take approximately ten minutes to complete. After completion of the first set of questionnaires, the participant would again be asked whether to continue to the next set of questionnaires. If at any stage a respondent no longer wanted to participate they were directed to the free tutorials. In addition, to increase the number of participants in the survey, they were given the chance to win an 8GB iPod touch valued at $249 RRP after completion of the survey.

As this online survey was conducted together with other research using the same methods on perception but comprising motorcycles and logos, the questions and image stimuli were displayed in random view to provide the freedom for participants to answer the questionnaire based on their product of preference.

7.3 Stimuli

The stimulus materials followed the format of Canter, West, and Wools” (1974) Room Effect and the pilot test survey, which both used head-and-shoulder photographs of people (Asian and Caucasian, male and female models) in the foreground together with photographs of cars (Mercedes Benz and Proton models) in the background. Both people and car images were chose through selecting and editing process which was carried out earlier (Figure 7.1 and Figure 7.2). The human models were positioned similarly to the vehicle, and the vehicle was digitally modified to be as similar in size, orientation, and colour as possible. Adobe Photoshop CS3 was used in order to achieve a good picture quality and composition. The eight compositions are shown in Figure 7.3.
Figure 7.1: Process of stimuli selection for people

*Source: (Getty Images 2009) and (Istockphoto 2009)
Figure 7.2: Process of stimuli selection for cars

*Source: (Google Images 2009)
7.3.1 People

In the pilot test survey, the selection of human models was based on the countries and types of participants that would participate in the survey. For instance, Dunn and Searle (2010) used British human models for their attractiveness rating with British participants. A similar concept was applied in the pilot test survey in which Malaysian human models were used for Malaysian participants while Australian human models were used for Australian participants.
For the actual test, since the mode of the survey was online, it was expected that although participants would be from all over the world they would mainly be from Western and Asian countries, as research indicated that the top 20 countries with the highest number of internet users originated from these two areas (see Table 7.2). Therefore, Caucasian and Asian models were selected for the actual survey.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>China</td>
<td>1,330,141,295</td>
<td>420,000,000</td>
<td>31.6 %</td>
<td>1,766.7 %</td>
<td>21.4 %</td>
</tr>
<tr>
<td>2</td>
<td>United States</td>
<td>310,232,863</td>
<td>239,893,600</td>
<td>77.3 %</td>
<td>151.6 %</td>
<td>12.2 %</td>
</tr>
<tr>
<td>3</td>
<td>Japan</td>
<td>126,804,433</td>
<td>99,143,700</td>
<td>78.2 %</td>
<td>110.6 %</td>
<td>5.0 %</td>
</tr>
<tr>
<td>4</td>
<td>India</td>
<td>1,173,108,018</td>
<td>81,000,000</td>
<td>6.9 %</td>
<td>1,520.0 %</td>
<td>4.1 %</td>
</tr>
<tr>
<td>5</td>
<td>Brazil</td>
<td>291,163,330</td>
<td>75,943,600</td>
<td>27.8 %</td>
<td>1,418.9 %</td>
<td>3.9 %</td>
</tr>
<tr>
<td>6</td>
<td>Germany</td>
<td>82,282,988</td>
<td>65,123,800</td>
<td>79.1 %</td>
<td>171.3 %</td>
<td>3.3 %</td>
</tr>
<tr>
<td>7</td>
<td>United Kingdom</td>
<td>62,348,447</td>
<td>51,442,100</td>
<td>82.5 %</td>
<td>234.0 %</td>
<td>2.6 %</td>
</tr>
<tr>
<td>8</td>
<td>Russia</td>
<td>133,990,205</td>
<td>59,700,000</td>
<td>42.8 %</td>
<td>1,825.8 %</td>
<td>3.0 %</td>
</tr>
<tr>
<td>9</td>
<td>France</td>
<td>64,768,389</td>
<td>44,625,300</td>
<td>68.9 %</td>
<td>425.0 %</td>
<td>2.3 %</td>
</tr>
<tr>
<td>10</td>
<td>Korea South</td>
<td>48,636,068</td>
<td>39,440,000</td>
<td>81.1 %</td>
<td>107.1 %</td>
<td>2.0 %</td>
</tr>
<tr>
<td>11</td>
<td>Iran</td>
<td>76,923,300</td>
<td>33,320,000</td>
<td>43.2 %</td>
<td>13,180.0 %</td>
<td>1.7 %</td>
</tr>
<tr>
<td>12</td>
<td>Italy</td>
<td>58,090,681</td>
<td>30,026,400</td>
<td>51.7 %</td>
<td>127.5 %</td>
<td>1.5 %</td>
</tr>
<tr>
<td>13</td>
<td>Indonesia</td>
<td>242,958,302</td>
<td>39,000,000</td>
<td>12.3 %</td>
<td>1,400.0 %</td>
<td>1.5 %</td>
</tr>
<tr>
<td>14</td>
<td>Spain</td>
<td>46,505,963</td>
<td>29,093,984</td>
<td>62.6 %</td>
<td>440.0 %</td>
<td>1.5 %</td>
</tr>
<tr>
<td>15</td>
<td>Mexico</td>
<td>112,468,855</td>
<td>30,600,000</td>
<td>27.2 %</td>
<td>1,028.2 %</td>
<td>1.6 %</td>
</tr>
<tr>
<td>16</td>
<td>Turkey</td>
<td>77,804,122</td>
<td>35,000,000</td>
<td>45.0 %</td>
<td>1,650.0 %</td>
<td>1.8 %</td>
</tr>
<tr>
<td>17</td>
<td>Canada</td>
<td>33,759,742</td>
<td>26,224,900</td>
<td>77.7 %</td>
<td>106.5 %</td>
<td>1.3 %</td>
</tr>
<tr>
<td>18</td>
<td>Philippines</td>
<td>99,900,177</td>
<td>29,700,000</td>
<td>29.7 %</td>
<td>1,385.0 %</td>
<td>1.5 %</td>
</tr>
<tr>
<td>19</td>
<td>Vietnam</td>
<td>99,571,130</td>
<td>24,269,083</td>
<td>27.1 %</td>
<td>1234.5 %</td>
<td>1.2 %</td>
</tr>
<tr>
<td>20</td>
<td>Poland</td>
<td>38,463,689</td>
<td>22,450,600</td>
<td>58.4 %</td>
<td>701.8 %</td>
<td>1.1 %</td>
</tr>
<tr>
<td>TOP 20 Countries</td>
<td>4,415,272,037</td>
<td>1,466,877,067</td>
<td>33.2 %</td>
<td>408.9 %</td>
<td>74.6 %</td>
<td></td>
</tr>
<tr>
<td>Rest of the World</td>
<td>2,430,317,923</td>
<td>499,113,549</td>
<td>20.5 %</td>
<td>286.0 %</td>
<td>25.4 %</td>
<td></td>
</tr>
<tr>
<td>Total World - Users</td>
<td>6,845,609,960</td>
<td>1,965,990,616</td>
<td>28.7 %</td>
<td>444.6 %</td>
<td>100.0 %</td>
<td></td>
</tr>
</tbody>
</table>

Table 7.2: Top 20 countries with highest number of internet users *Source: (Sarmukaddam & Garad 2004)

As shown in Table 7.2 China is the leading country in terms of the highest internet use followed by the US and Japan. The rest of the list comprises countries representing Western and Asian people, with no countries from the African continent present. This supports the rationale of using Caucasian and Asian human models in the actual test. Meanwhile, in terms of age, it was decided that 20 to 25 year old Caucasian and Asian (male and female) with average or neutral facial expressions were preferred in order to match the presumed participants’ age group.
7.3.2 Car Models

The pilot test indicates a product effect with the Mercedes Benz S-Class and Proton Waja used as stimuli. The results showed that the Mercedes Benz S-Class was better perceived than the Proton Waja by both Malaysian and Australian respondents, with participants' judgements towards the human models being enhanced.

This results of the pilot study indicated that the Mercedes Benz S-Class exterior design did not only excite older and established groups but also younger people. Therefore, in order to identify whether the current Proton design could match the Mercedes Benz, a more recent and stylish Proton model was selected for the actual test. The use of a more stylish model was suitable for the actual test as the participants were expected to be younger and as such prefer a more expressive product. This is supported by research undertaken by Henry (2002) which studied the influence of the social class on the relative salience of functional and expressive consideration. Henry found that younger people paid more attention to expressive product aspects than older people. In addition, research by Creusen (2010) found that younger people use more expressive purchase criteria, where „expressive“ was not only meant on a symbolic level but also related to styling aspects. This indirectly supports the rationale of a more stylish car being used in the actual test. The Mercedes Benz has predominantly been aimed at older and more established people, with the Mercedes Benz C-Class aimed at younger executive consumers (Loong 2010). The effectiveness of this marketing strategy was verified in India, where the average age of the Indian customer for Mercedes Benz was reduced from 50 years to 35-40 years (Das 2010). The Proton Persona was chosen simply to test its appearance against the Mercedes Benz C-Class.

Therefore, two cars were selected as stimuli for the actual test; the Mercedes Benz C-Class and the Proton Persona, with both models introduced in 2007.
7.4 Questionnaire

The rationale of the survey was to see if the exterior appearance of the cars affected the way the human models were perceived. Therefore, two sets of questions were employed. The first set focused upon the physical and demographic characteristics of the human model and are outlined in Table 7.3.

<table>
<thead>
<tr>
<th>Theme</th>
<th>Question/Item</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Demographic Characteristics</td>
<td>Q1. How tall do you think he/she is? (In cm)</td>
<td>Multiple choice</td>
</tr>
<tr>
<td></td>
<td>Q2. How heavy do you think he/she is? (In kg)</td>
<td>Multiple choice</td>
</tr>
<tr>
<td></td>
<td>Q3. How old do you think he/she is?</td>
<td>Open-ended</td>
</tr>
<tr>
<td></td>
<td>Q4. What level of education did he/she achieve?</td>
<td>Interval scale</td>
</tr>
<tr>
<td></td>
<td>Q5. What do you think his/her annual income will be?</td>
<td>Interval scale</td>
</tr>
</tbody>
</table>

Table 7.3: Questionnaire formation – Physical and demographic characteristics

The other set of questions focused upon the personality characteristics of the human models. Due to the “inconsistency effect” produced by some of the variables during the pilot test, seven were excluded from the actual test survey. The excluded variables were; unstable (neuroticism), anxious (neuroticism), vulnerable (neuroticism), friendly (agreeableness), kind (agreeableness), sporty (extraversion), and openness to new ideas (openness to experience). Table 7.4 outlines the variables that were retained for the actual test.

<table>
<thead>
<tr>
<th></th>
<th>Extraversion</th>
<th>Agreeableness</th>
<th>Conscientiousness</th>
<th>Openness to Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Masculine / Feminine</td>
<td>Trustworthy</td>
<td>Positive Attitude</td>
<td>Creative</td>
</tr>
<tr>
<td>2.</td>
<td>Elegant</td>
<td>Generous</td>
<td>Reliable</td>
<td>Stylish</td>
</tr>
<tr>
<td>3.</td>
<td>Attractive</td>
<td></td>
<td>Efficient</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td>Organized</td>
<td></td>
</tr>
</tbody>
</table>

Table 7.4: Types of personality adjectives used in the actual test survey questionnaire

To counteract a possible order effect the statements were arranged in random order. Similar to the pilot test survey, a nine-point Lickert scale was used for each statement to indicate the amount of agreement or disagreement (from strongly
agree to strongly disagree). As international participants were expected to participate in this survey, the questionnaire was prepared in English. Table 7.5 lists the remaining questions used in the actual survey.

<table>
<thead>
<tr>
<th>Theme</th>
<th>Question/Item</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conscientiousness</td>
<td>Q6. He/She looks like he/she has a positive attitude to life.</td>
<td>9-point scale</td>
</tr>
<tr>
<td>Openness to Experience</td>
<td>Q7. He/She is creative.</td>
<td>9-point scale</td>
</tr>
<tr>
<td>Extraversion</td>
<td>Q8. He/She looks masculine/feminine.</td>
<td>9-point scale</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>Q9. He/She looks trustworthy.</td>
<td>9-point scale</td>
</tr>
<tr>
<td>Extraversion</td>
<td>Q10. He/She is elegant.</td>
<td>9-point scale</td>
</tr>
<tr>
<td>Openness to Experience</td>
<td>Q11. He/She looks stylish.</td>
<td>9-point scale</td>
</tr>
<tr>
<td>Extraversion</td>
<td>Q12. He/She is attractive.</td>
<td>9-point scale</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>Q13. He/She appears generous.</td>
<td>9-point scale</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>Q14. He/She looks reliable.</td>
<td>9-point scale</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>Q15. He/She looks efficient.</td>
<td>9-point scale</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>Q16. He/She looks organized.</td>
<td>9-point scale</td>
</tr>
</tbody>
</table>

Table 7.5: Questionnaire formation

7.5 Exploratory Factor Analysis

The statistical analyses followed that of the pilot test survey. In this Exploratory Factor Analysis was used in order to reduce the number of the questions/variables to a few factors and to establish the underlying relationships between groups of questions.

Factor Analysis was performed using Principal Axis Factoring (PAF) with a Direct Oblimin rotation. The Kaiser-Meyer-Olkin (KMO) obtained was .896 which indicated a good correlation amongst variables. Bartlett’s test of sphericity achieved a level of >.001. A value of 7024.6 for the Bartlett chi-square statistic was obtained, which confirmed that variables were inter-correlated.

Once the extraction of factors was completed, examining the table of „Communalities” was important in order to understand how much of the variance in each of the original variables was explained by the extracted factors. Higher
communalities that exceeded .2 for each variable were needed. This was achieved as outlined in Table 7.6. Height (.642) achieved the highest communality, while the lowest communality was for masculine/feminine (.355).

### Communalities

<table>
<thead>
<tr>
<th></th>
<th>Initial</th>
<th>Extraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>.417</td>
<td>.642</td>
</tr>
<tr>
<td>Weight</td>
<td>.413</td>
<td>.605</td>
</tr>
<tr>
<td>Post_Attd</td>
<td>.438</td>
<td>.387</td>
</tr>
<tr>
<td>Creative</td>
<td>.469</td>
<td>.446</td>
</tr>
<tr>
<td>Masculine_Feminine</td>
<td>.411</td>
<td>.355</td>
</tr>
<tr>
<td>Trustworthy</td>
<td>.573</td>
<td>.566</td>
</tr>
<tr>
<td>Elegant</td>
<td>.565</td>
<td>.572</td>
</tr>
<tr>
<td>Stylish</td>
<td>.571</td>
<td>.496</td>
</tr>
<tr>
<td>Attractive</td>
<td>.546</td>
<td>.477</td>
</tr>
<tr>
<td>Generous</td>
<td>.582</td>
<td>.574</td>
</tr>
<tr>
<td>Reliable</td>
<td>.631</td>
<td>.610</td>
</tr>
<tr>
<td>Efficient</td>
<td>.604</td>
<td>.559</td>
</tr>
<tr>
<td>Organized</td>
<td>.568</td>
<td>.495</td>
</tr>
</tbody>
</table>

**Extraction Method:** Principal Axis Factoring

Table 7.6: Communalities extraction

Table 7.7 details the Total Variance Explained. Two factors emerged that explained 52% of the variation in the data. The eigenvalues were 6.00 for the 1st factor and 1.65 for the 2nd factor.

### Total Variance Explained

<table>
<thead>
<tr>
<th>Factor</th>
<th>Initial Eigenvalues</th>
<th>Extraction Sums of Squared Loading</th>
<th>Rotation Sums of Squared Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>% of Variance</td>
<td>Cumulative %</td>
</tr>
<tr>
<td>1</td>
<td>6.002</td>
<td>46.166</td>
<td>46.166</td>
</tr>
<tr>
<td>2</td>
<td>1.650</td>
<td>12.693</td>
<td>58.859</td>
</tr>
<tr>
<td>3</td>
<td>.941</td>
<td>7.240</td>
<td>66.099</td>
</tr>
<tr>
<td>4</td>
<td>.899</td>
<td>6.917</td>
<td>73.016</td>
</tr>
<tr>
<td>5</td>
<td>.590</td>
<td>4.540</td>
<td>77.556</td>
</tr>
<tr>
<td>6</td>
<td>.546</td>
<td>4.198</td>
<td>81.754</td>
</tr>
<tr>
<td>7</td>
<td>.453</td>
<td>3.485</td>
<td>85.239</td>
</tr>
<tr>
<td>8</td>
<td>.405</td>
<td>3.118</td>
<td>88.357</td>
</tr>
<tr>
<td>9</td>
<td>.352</td>
<td>2.709</td>
<td>91.066</td>
</tr>
<tr>
<td>10</td>
<td>.335</td>
<td>2.574</td>
<td>93.640</td>
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<tr>
<td>11</td>
<td>.294</td>
<td>2.265</td>
<td>95.95</td>
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<tr>
<td>12</td>
<td>.272</td>
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<td>97.999</td>
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<tr>
<td>13</td>
<td>.260</td>
<td>2.001</td>
<td>100.000</td>
</tr>
</tbody>
</table>

**Extraction Method:** Principal Axis Factoring.

b. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

Table 7.7: Total Variance Explained

144
To verify the number of factors, a Scree Plot was used to plot the eigenvalues in decreasing order and to provide a visual graph for the factor selection. Figure 7.4 shows the factor analysis output and Scree Plot for the eigenvalues. Furthermore, the loadings on the 1st factor were high compared to the 2nd.

![Scree Plot](image)

As the Total Variance Explained and Scree Plot confirmed two factors, interpretation for this test was made using the pattern matrix, as shown in Table 7.8. Variables that scored an absolute value or greater than .5 were included in the factor. Factor scores with such loadings ranged between .5 and .9. The two factors comprised of 11 and 2 variables, respectively.

<table>
<thead>
<tr>
<th>Pattern Matrix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor</td>
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</table>

Extraction Method: Principal Axis Factoring.
Rotation Method: Oblimin with Kaiser Normalization.
a. Rotation converged in 3 iterations.

Table 7.8: Pattern Matrix
In order to test the internal reliability of the scales created from the factor analysis, Cronbach’s Alpha was carried out. The purpose of this test was to calculate the average of all possible split-half reliability coefficients (Bryman 2008 p. 151). The two factors were labelled Factor 1 – Personality and Factor 2 – Physical Attributes. In relation to the five factor model of personality traits, none corresponded in these results.

The internal consistency of the two factors was measured using Cronbach’s Alpha. Results presented in Table 7.9 indicate that personality and appearance produced high alpha coefficients, of .914 to .916, respectively. Furthermore, a normality test was performed using Skewness and Kurtosis. The result showed a skewness coefficient for personality of $\sqrt{\beta_1} = .074$ and for physical attributes of $\sqrt{\beta_1} = .187$. A kurtosis coefficient for personality of $\beta_2 = -.283$ was obtained indicating that a normal distribution was effectively attained.

<table>
<thead>
<tr>
<th>Factors</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Cronbach’s Alpha</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personality</td>
<td>1053</td>
<td>1.09</td>
<td>9.00</td>
<td>5.133</td>
<td>1.558</td>
<td>.914</td>
<td>.074</td>
<td>-.283</td>
</tr>
<tr>
<td>Reliable +</td>
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<tr>
<td>Generous +</td>
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<tr>
<td>Elegant +</td>
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<tr>
<td>Trustworthy +</td>
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<tr>
<td>Efficient +</td>
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<tr>
<td>Stylish +</td>
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<td>Organised +</td>
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<tr>
<td>Attractive +</td>
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<tr>
<td>Creative +</td>
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<td>Attd+</td>
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<tr>
<td>Masculine/</td>
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</tr>
<tr>
<td>Feminine</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Physical</td>
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<td>12.00</td>
<td>4.297</td>
<td>2.483</td>
<td>.916</td>
<td>.187</td>
<td>-.820</td>
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<td>Weight+</td>
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<td>Height</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Valid N (listwise)</td>
<td>1053</td>
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<td></td>
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</tr>
</tbody>
</table>

Table 7.9: Descriptive Statistics – Factors Reliability

The Exploratory Factor Analysis simplified the thirteen variables into two factors, personality and physical attributes. Three excluded variables - age, education, and annual income - were also used as dependent variables in the next statistical analysis employing the Univariate ANOVA method.
7.6 Univariate ANOVA Analyses

Univariate ANOVA analysis was applied in order to test the three independent variables. This involved within-subjects variables and between-subjects factors. An additional test was applied in order to test for gender effects.

One within-subject variable was included in the analysis; car (Mercedes Benz and Proton), as well as two between-subjects factors; model gender (male and female) and model nationality (Asian and Caucasian). Table 7.10 shows the significant main effects and interactions extracted from the Univariate ANOVA test.

Table 7.10: Univariate ANOVA result, significant effects and interactions

<table>
<thead>
<tr>
<th>FACTORS</th>
<th>Personality</th>
<th>Physical Attributes</th>
<th>Age</th>
<th>Education</th>
<th>Annual Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFFECT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Main Effect</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Car</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.006</td>
</tr>
<tr>
<td>Model Gender</td>
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<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Nationality</td>
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<td></td>
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<td></td>
<td>0.045</td>
</tr>
<tr>
<td><strong>Two Way Interactions</strong></td>
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<td></td>
<td></td>
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<tr>
<td>Car x Model Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model Gender x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nationality</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Car x Nationality</td>
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<td></td>
<td></td>
<td></td>
<td>0.036</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
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<td>0.003</td>
</tr>
</tbody>
</table>

7.6.1 Factor 1: Personality

Results for the Personality factor indicate that there is a highly significant main effect for model gender, $F(1, 1046) = 22.950$, $p=.000$, partial eta squared $=.021$.

Figure 7.5 shows that the participants perceived the female model more favourable than the male model.
7.6.2 Factor 2: Physical Attributes

Results for the Physical Attributes indicate main effect for model gender \((F (1, 1046) = 93.247, p=.000, \text{partial eta squared} =.082)\), and significant interaction between car and nationality \((F (1, 1046) = 4.425, p=.036, \text{partial eta squared} =.004)\).

Figure 7.6 show that participants judged the male model better in terms of physical attributes than the female models.

Figure 7.7 shows the interaction between car and nationality. The male and female Caucasian models appearing with the Mercedes Benz were rated more positively than with the Proton. There was no difference for the Asian models.
7.6.3 Age

The result for Age indicate main effect for model gender ($F(1, 859) = 13.704$, $p=.000$, partial eta squared =.016) and nationality ($F(1, 859) = 4.022$, $p=.045$, partial eta squared =.005).

Figure 7.8 show that the participants judged the female models older than the male models.
Figure 7.9 indicates that the Caucasian models was perceived as older than the Asian models.

7.6.4 Education

For Education, the results indicate is a highly significant main effect of model gender (F (1, 1043) =16.609, p=.000, partial eta squared =.016).

Figure 7.10 indicates that the participants judged the female models as more educated than the male models.
7.6.5 Annual Income

The results indicate that there is a significant interaction between car and nationality (F (1, 1044) =8.708, p=.003, partial eta squared =.008).

Figure 7.11 shows that the participants rated the Caucasian models appearing with the Mercedes Benz as having a higher income than with the Proton. No differences occurred for the Asian models.

An interesting feature of the results is that there were more effects due to gender than to car and nationality. For this reason, and to unravel this gender effect, it was decided to run the analysis again separately for each gender. Table 7.11 outlines the significant interaction as well as the main effects extracted from the Univariate ANOVA.

<table>
<thead>
<tr>
<th>FACTORS</th>
<th>Personality</th>
<th>Physical Attributes</th>
<th>Age</th>
<th>Education</th>
<th>Annual Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional Test</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Car x Male Caucasian</td>
<td></td>
<td>.002</td>
<td>.029</td>
<td>.012</td>
<td></td>
</tr>
<tr>
<td>Car x Female Caucasian</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.002</td>
</tr>
</tbody>
</table>

Table 7.11: Univariate ANOVA result, significant effects and interactions
7.6.6 Physical Attributes

Results for the Physical Attributes factor show that there is a significant interaction between car and male Caucasian (F (1, 264) = 9.770, p = .002, partial eta squared = .036).

As indicated in Figure 7.12 the male Caucasian model appearing with the Mercedes Benz was perceived as physically taller and heavier than with the Proton. This effect was absent for female models.

![Figure 7.12: Univariate ANOVA results for physical attributes – car/male Caucasian](image)

7.6.7 Education

For Education, the results indicate that there is a significant interaction between car and male Caucasian (F (1, 249) = 4.816, p = .029, partial eta squared = .019).

As shown in Figure 7.13 the male Caucasian model appearing with the Mercedes Benz was perceived to be more highly educated than with the Proton. This effect was absent for female models.
7.6.8 Annual Income

In terms of annual income, the results indicate a significant interaction between car and male Caucasian (F (1, 249) =6.340, p=.012, partial eta squared =.025), and car and female Caucasian (F (1, 2644) =9.770, p=.002, partial eta squared =.036).

As shown in Figure 7.14 the male Caucasian model with the Mercedes Benz is perceived as having a higher annual income than the model with the Proton.

Similarly, in Figure 7.15, the participants rated the female Caucasian model as having a higher annual income with the Mercedes Benz than with the Proton.
7.8 Discussion

The pilot test concentrated on Malaysian and Australian participants. The online survey however involved participants from many countries across the world. Therefore, the results were expected to vary from the pilot study.

On the basis of these results, it would be possible to extend the concept of the Room Effect into the Product Effect. The empirical verification provides confidence that association with a product involves a transference of product qualities to the person associated with it, as it does with the Room Effect. The results reveal highly significant differences for some of the measure used, indicating that the car effected how the person was seen. There were also gender and nationality differences.

Overall the results demonstrate that a strong car effect occurs for the male Caucasian model. The effect covers physical attributes, education, and annual income. This can be closely related to the pilot test results which indicated a strong car effect upon physical attributes and annual income relating to the male models. Annual income can be linked with economic advantage and social status, which also is associated with height. As mentioned earlier, Case and Paxson (2006), found that status can be recognized through the height of an individual; that is, if a person is tall, he or she tends to hold higher status jobs. Therefore, all three items can be linked to status. As the results were more positive for the Caucasian male model seen with the Mercedes Benz rather than the Proton, this may suggest that
the Mercedes Benz makes the Caucasian male model look taller, heavier and wealthier than their Asian counterparts.

In terms of nationality differences, 47 per cent of the sample consisted of participants from Australia, India, and USA, the other 53 per cent coming from other countries.

The results for nationality differences indicate that there were more pronounced for the male and female Caucasian models. This may be due to the participants being more exposed to Caucasian models than to Asian models through the electronic and print media.

A surprising feature of the results is how little impact the car had upon perceptions of the Asian models. In the final analyses where male and female models were analysed separately, there was no statistically significant car effect for either the male or female Asian models. This may effect the distribution of respondents whereby 47% were from USA, India, and Australia. Advertisement for cars – certainly in the USA and Australia – use Caucasian models. And this carry over from media displays may have effected associations with cars. Unfortunately, it was not possible to identify which participants were from which countries, only the total per country.

7.9 Summary

The results confirm the existence of a Product Effect. This effect was mainly present for the Caucasian male and, to a lesser extent, the Caucasian female. Surprisingly, the Product Effect did not extent to the Asian models. This may be due to media association of cars with Caucasians or it may be an artefact of the international distribution of participants.
8 DISCUSSION AND CONCLUSION

8.1 Introduction

The research was focused upon developing an innovative method of market research in relation to the car industry. Practical application was carried out on a car made by Proton, the Malaysian manufacturer. This was intended to verify whether the method could be applied to products, in this case automobile. As such the main theme of the research was the application of the Room Effect to automobiles.

As a lead up to the practical application, the following research steps were taken. First, background knowledge about Proton in the car industry was analysed. Second, the existing methods used by various car companies in consumer market research and types of perception studies in various fields of design were investigated. Finally, research was carried out using qualitative and quantitative methods which involved a pilot study and an actual test survey based on the product alone and on the product together with its owner.

One research question and two subsidiary questions were formulated:

Does a product have an effect on how people perceive its owner?

Are there cultural differences in this perception?

Are there gender differences in this perception?

The Room Effect method, developed by Canter, West and Wools (1974), was the main method used to gain understanding of user perceptions. Semantic Differential techniques were used as a support.
8.2 Relevance of Room Effect Method to Products

As this research studied the role of the car in person perception, photographs of people with cars were incorporated together with the Five Factors Model (FFM) of personality as product stimuli and as a basic platform of the questionnaire. This was tested in the pilot and actual survey.

The results from the pilot and actual survey show that this method is reliable and can be applied to study perception in other products. Both tests showed that there are cultural and gender differences in perception. In terms of gender, the results showed that the primary effect occurs for the male models with Mercedes Benz in relation to height and annual income. This was especially noticeable in the pilot survey. In the actual test, two additional factors were included besides height and annual income; that is, physical attributes and education. As the results show that there is an effect on these four factors, the Room Effect method is considered effective and can now be used to investigate other products. Moreover, the results also suggest Mercedes Benz elicits more positive responses from respondents for men than for women. This can be related to market research carried out in the USA which found that Mercedes Benz is in the list of the top 10 vehicles with the highest percentage of male drivers, especially the G-Class (88.84%) and GL-Class (90.47%) (Halvorson 2008). This suggests that the Room Effect method can not only be used for products, but could also identify the type of image a car portrays in terms of gender.

In terms of cars, more positive results were found for the Mercedes Benz than for the Proton. This accords with the real market situation where people have different perceptions of both cars. Mercedes Benz is in the expensive car category used by high income people which reflects a person’s status, while Proton is in the moderately priced car segment, suitable for middle income people.

The Room Effect method was also found to be effective in identifying cultural differences. This was found in the pilot test with Australian and Malaysian participants, where personality, appearance, height and age were found to differ. However, the actual test was carried out using an internet survey in which the Internet Protocol (IP) address of different countries could not be traced due to ethical constraints. Therefore, an actual test of cultural perceptions could not be identified and compared with the pilot test results.
The results from this research have shown that the Room Effect method is valid for researching perception of cars and therefore may be generalisable to other products.

Second, as the Room Effect method used pictures of cars and human models together with questionnaires based on Five Factor Model (FFM) of personality, it offers considerable advantages for designers by providing data before any development work begins. Both data and pictures can be used as guidelines in assisting designers in translating an idea into a product form that suits users’ preferences.

Third, the Room Effect method is able to identify factors or dimensions that relate to automobiles. In this research, as Five Factor Model (FFM) of personality was used to recognise the personality of the person in the scenario, as influenced by the product, three factors were identified based on the pilot and actual test which were personality, appearance, and physical attributes. Recognising the factors can be useful for product designers in assisting them to prioritize their design considerations before and during the development process.

One final advantage of Room Effect method is that as it can be used as an online quantitative survey. This can provide benefits to both researchers and car companies as large numbers of respondents can be involved. In addition, it can identify the affective needs of clients from different cultural backgrounds.

8.3 Limitations and Future Research

Although the Room Effect method was found to be effective in studying user perception of cars, it is important to note its limitations in order to make improvements in future testing. A number of areas were identified as limitations in this research.

An important limitation in this research was the inability to compare the results of cultural differences in the actual test with results from the pilot study. This was due to restrictions on identifying the Internet Protocol (IP) address. Since the actual test involved multi-cultural participants, it would have been beneficial to compare the cultural differences from the pilot test with the actual study in order to test the perception of participants from various countries.
A further limitation in this research was that the pictures of stimuli consisting of cars together with humans only concentrated on the front view. Not only the front visual view could be assessed but also other visual views such as side and rear. The effect of the car appearance on the judgement of the person could consider different angles in order to assist designers in styling development. The current research provides designers with ideas based on front view only.

Another limitation of this study was the total number of questions in the questionnaire, especially in the pilot test. The questionnaire was divided into two sections, physical/demographic characteristics and personality, with four sets of questions. In each section, each set contained 23 questions. This meant that participants had to answer four sets of questions in one session and 92 questions overall. The large number of questions may have affected participants in terms of fatigue.

Although the actual test was successfully completed, the question-and-answer-format needed to be revised. The internet survey style employed in the actual test only provided one set of 23 questions to be answered by respondents, which meant they only viewed one picture of the stimuli. One limitation here is that this can be defined as a separate evaluation mode (Hsee & Leclerc 1998). In this mode participants’ judgement could be less effective in terms of accuracy as there was no comparison with other products, meaning no range was provided. Research by Willemsen & Keren (2004) suggests that negative attributes weigh more in separate rather than in joint evaluation mode. Therefore, joint evaluation mode would be more appropriate in this test.

The above research limitations show that improvements can be made in order to strengthen this method for future research. The main improvements should include an IP address in order to discover cultural differences. A joint evaluation mode in which two pictures of different cars are put side by side is also preferred. Last, the study of perception of product, especially cars, could include different visual views (Figure 8.1).
The inclusion of the Mercedes Benz and Proton cars in the pilot and actual test represented the high and low end of the market. The results showed that there was a significant car effect based on gender, nationality and culture. For this reason, future research could focus on using cars with the same market segment (Figure 8.2). The factors which emerged during the pilot and actual studies can be used as a guideline in designing similar questionnaires.

Moreover, it would also be beneficial if this method could be employed during the styling process when a prototype is under design development phase. The Room Effect method could be used where the prototype is employed as stimuli together with a competitor car from the same segment. The designers could use the results to make design adjustments before the car is ready for mass production. This would
also provide information for designers as to whether their own perceptions matched those of their client group.

Finally, since the Room Effect method was found to be effective, future tests could be applied to other products (Figure 8.3) that are socially and privately consumed. Socially consumed products are those that are publicly visible and likely to be associated with personal characteristics of their user, rather than products which are privately consumed (Wright, Claiborne & Sirgy 1992).

![Figure 8.3: Example of general products (chair) using Room Effect method](image)

8.4 Conclusion

This research introduces new methods to investigate how products are perceived, such as the Room Effect, the Five Factor Model and the Semantic Differential. In the literature review a broad range of methods were identified in studies intended to understand how consumers perceive products. However, a limitation is their focus upon the product per se: the possibility of product transference has not been considered whereby characteristics of the product transfer to their owner.

As the present research focuses on consumer perception of cars, the Room Effect was considered to be unique amongst the three methods and represents the main method for this research. Furthermore, the Room Effect differs from existing methods adopted by the car industry as it focuses upon the effect that the product has on the person. This is a major difference from other methods used to investigate products. Effectively, participants judged the person – or owner – and not the car. The car therefore was tested as a potential agent of person perception; and it did in fact exert influence. To demonstrate the Room Effect with products a decision was made to test extremely dissimilar examples of the same product.
DISCUSSION AND CONCLUSION

category – cars. The rationale was that it differences in perception failed to emerge for such dissimilar examples, they were unlikely to emerge for more similar examples. Now, having demonstrated effects for dissimilar stimuli, it would be informative to look at more similar examples. For example, and to remain with the Malaysian national car, Proton, how does it fare when compared to its direct competitors in its market segment? Within its country of origin it is protected by high tariff walls built against its competitors; and internationally it competes on price (for example, until very recently it was advertised as Australia’s cheapest car). But why should this be so? Is its poor sales performance due to deficiencies in technology, driveability or some less tangible characteristic such as styling? The application of the Room Effect method could help elucidate this difficult problem faced by Proton. Unfortunately, this is likely to intensify as Chinese cars infiltrate the Malaysian market and compete on price.

It is interesting that the Room Effect, though more than 50 years old, has not been applied to other products. At the time this method was used in environmental psychology in the 1970s, design research hardly existed. Therefore, to adapt this method to products was most unlikely at the time. Surprisingly, it has been overlooked in the years since. Its value, as indicated in the present research, is that it provides measures of transference. From the designers” standpoint this information can be fed into the design process. An example of this would be the redesign of a car for an existing market. It would be informative to gain transference characteristics within that market for both, the existing model and its main rival, other methods would be used in combination. As such, the Room Effect method expands the existing arsenal of available methods.

Finally, within a global manufacturing environment it is too dangerous to rely solely upon the intuition and experience of designers. Industry requires greater certainty when considerable financial investment is involved in product development. This will be particularly so when dealing with diverse export markets. Increasingly, design will be informed by empirical research data that provide direction and, importantly, minimize risk. The Room Effect method is but one. However, it allows for great flexibility in its use and could be refined to apply to a wide range of products. The underlying objective of the present research was to examine if the Room Effect extends to products. Having found in the affirmative, we can declare that there is a Product Effect.
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APPENDIX A – ETHICS APPROVAL AND LETTER FOR CHANGE OF THESIS TITLE
APPLICATION TO CONDUCT RESEARCH IN MALAYSIA

With reference to your application dated 1 April 2008, I am pleased to inform you that your application to conduct research in Malaysia has been approved by the Research Promotion and Co-Ordination Committee, Economic Planning Unit, Prime Minister’s Department. The details of the approval are as follows:

Researcher’s name: RAJA AHMAD AZMEER BIN RAJA AHMAD EFFENDI

Passport No. / I. C No: 651028-06-6109

Nationality: MALAYSIAN

Title of Research: “EMOTIONAL DESIGN: BETWEEN MALAYSIAN AND AUSTRALIAN PERCEPTION”

Period of Research Approved: THREE YEARS

2. Please collect your Research Pass in person from the Economic Planning Unit, Prime Minister’s Department, Parcel B, Level 4 Block B5, Federal Government Administrative Centre, 62502 Putrajaya and bring along two (2) passport size photographs. You are also required to comply with the rules and regulations stipulated from time to time by the agencies with which you have dealings in the conduct of your research.

3. I would like to draw your attention to the undertaking signed by you that you will submit without cost to the Economic Planning Unit the following documents:
a) A brief summary of your research findings on completion of your research and before you leave Malaysia; and

b) Three (3) copies of your final dissertation/publication.

4. Lastly, please submit a copy of your preliminary and final report directly to the State Government where you carried out your research. Thank you.

Yours sincerely,

[MUNIRAH ABD. MANAN]
For Director General,
Macro Economic Section,
Economic Planning Unit.
E-mail: munirah@epu.gov.my
Tel: 88862309/2019/2958
Fax: 88883798

ATTENTION

This letter is only to inform you the status of your application and **cannot be used as a research pass**.

C.c:

Ketua Setiausaha,
Kementerian Pengajian Tinggi,
Aras 7, Blok E3, Parcel E,
Pusat Pentadbiran Kerajaan Persekutuan,
62505 Putrajaya
(u.p: En. Ahmad b. Osman) (Ruj. Tuan: KPT.R.620-1/1/Jld.7 (31))
From: Keith Wilkins
To: Allan Whitfield; Simon Jackson
CC: Deirdre Barron
Date: Monday - April 14, 2008 2:21 PM
Subject: SUHREC Project 0708/180 Ethical Review

To: Prof Allan Whitfield/Dr Simon Jackson, Design

Dear Allan and Simon

SUHREC Project 0708/130 Customer Emotional Needs in Motorcycle and Car Design: a Cross Cultural Perspective
Prof A Whitfield, Design, Dr Simon Jackson, Mr Azhari Md Hashim and Mr Raja Ahmad Azmeer Raja
Ahmad Effendi.
Proposed Duration: 07/04/2008 To 01/03/2009

Ethical review of the above project protocol was undertaken by Swinburne's Human Research Ethics Committee (SUHREC) at its Meeting 2/2008 held 4 April 2008, the outcome of which is as follows.

Approved subject to the following addressed to the Chair's (or delegate's) satisfaction:

1. Consent instrument: revision is needed to suit anonymous on-line participation and implied consent by completion and submission of questionnaire (ie, no facility for signed consent is needed and therefore needs to be deleted. The complaints clause is retained though.)

2. English language version of consent/research instruments need significant correction/revision given several grammatical/stylistic errors. (Nb The understanding remains that the English version properly correlates with the Malay version).

3. Any approval given by SUHREC would be on the understanding that appropriate Malaysian Government or other authority has been obtained to conduct the research project in Malaysia; evidence of such authority needs to be forwarded to my office for the record.

To enable further ethical review/initialise clearance, please would you respond to the above items (by direct email reply if preferred), attaching the revised English/Malay consent instruments in light of the above. A full revised ethics clearance application is not required and should not be sent; missing, additional or revised text from the application can be incorporated into your response. Please also note that human research activity (including active participant recruitment) cannot commence before proper ethics clearance is given in writing.

Please contact me if you have any queries about the ethical review process undertaken. The SUHREC project number should be quoted in communication.

Yours sincerely

Keith Wilkins
Secretary, SUHREC

----------------------------------------
Keith Wilkins
Research Ethics Officer
Swinburne Research (H68)
Swinburne University of Technology
P O Box 218
HAWTHORN VIC 3122
Tel +61 3 9214 5218
Fax +61 3 9214 5267
Dear Allan and Simon,

SUHREC Project 0708/180 Customer Emotional Needs in Motorcycle and Car Design: a Cross Cultural Perspective
Prof A Whitfield, Design, Dr Simon Jackson, Mr Azhari Md Hashim and Mr Raja Ahmad Azmeer Raja Ahmad Effendi.
Approved Duration: 23/04/2008 To 01/03/2009

I refer to the ethical review of the above project protocol undertaken by Swinburne’s Human Research Ethics Committee (SUHREC). Your responses to the review, as emailed on 15 April 2008 with a further revised consent statement emailed on 22 April 2004, were put to a delegate of SUHREC for consideration.

I am pleased to advise that approval for the project to proceed has been given as submitted to date in line with standard on-going ethics clearance conditions here outlined. However, please note that evidence of authority to undertake human research activity in Malaysia is needed before such activity commences.

- 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.

https://www.grouplease.swin.edu.au/pw/webacc?...m.dm=860b155787b&envelope=16merge=megazine (1 of 2) [24/04/2008 9:50:01 AM]
WebAccess

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.

Best wishes for the project.

Yours sincerely

Keith Wilkins
Secretary, SUHREC

----------------------------------

Keith Wilkins
Research Ethics Officer
Swinburne Research (H68)
Swinburne University of Technology
P O Box 218
HAWTHORN VIC 3122
Tel +61 3 9214 5218
Fax +61 3 9214 5257

https://www.groupwise.swin.edu.au/gw/webacc...m.dm=56813578&U...
Human Research Ethics Committee

Final Report for an Approved Protocol

1. Project Details – Summary

Provide the most current approved details of your protocol

<table>
<thead>
<tr>
<th>HREC Project No.</th>
<th>SUNREC Project 0708/180</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principal Investigator/Supervisor:</td>
<td>Prof A Whitfield / Dr Simon Jackson</td>
</tr>
<tr>
<td>Other Investigators:</td>
<td>Arshad Md Hashim/Raja Ahmad Azmeer Raja Ahmad</td>
</tr>
<tr>
<td>Duration of Project:</td>
<td>22/04/2008 To 01/09/2009</td>
</tr>
</tbody>
</table>

2. Project Status

Mark with an X the boxes which best describe the status of the human research elements of the project

- [ ] Project yet to commence**
- [ ] Project delayed part-way**
- [x] Project completed**
- [ ] Project abandoned before start**
- [ ] Project abandoned after start**
- [ ] Extension of duration to ethics clearance required**

Explain further any options that are marked ** and provide start and new end date as applicable

Not applicable.

3. Compliance with Conditions of Ethics Clearance

If the project was subject to any special conditions for continuing ethics clearance, including submission of approval letters from other institutions, explain how these have been met

Approval letter and permission has been granted by the Research Committee of the Economic Planning Unit (EPU) of the Prime Minister’s Department of Malaysia.

4. Modifications to Approved Project Protocols

If there were any procedures and instruments modified during the course of the project, including recruitment and informed consent procedures and instruments explain how/why modifications were undertaken, attaching any new/revised research/instrument

Further ethics clearance to run a competition in conjunction with the online surveys was approved. An iPod Touch was offered valued at AUD 249.

Contact resethics@swin.edu.au for advice on how best to forward a separate case to HREC if new modifications are proposed

SUNREC Annual/Final Report Form (2002-2006)
5. **Unanticipated Issues of Incidents**
Detail any experiences, incidents or issues (adverse or otherwise), especially with respect to research participants, which were unintended or unanticipated and explain how these were dealt with.

Not applicable.

6. **Participant Involvement**
Give the numbers of individual participants involved in the project to date.

<table>
<thead>
<tr>
<th>Males</th>
<th>Females</th>
<th>Total Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1706</td>
<td>673</td>
<td>2379</td>
</tr>
</tbody>
</table>

Indicate whether participant numbers to date are consistent with the approved protocol

- [ ] Yes
- [x] No

If participant numbers have varied, give reasons

The participants’ numbers are increased in order to run a more complex statistical analysis.

7. **Security of Data (Continuing or Completed Projects)**
Explain how research data and informed consent records are being securely retained and for how long. Also indicate expected method of secure data/records disposal (it must comply with Swinburne and Legislative requirements)

The data from the paper based and online questionnaires have been entered into SPSS and are kept in password protected university and private computers.

The paper questionnaires have been lodged in the Faculty of Design data Storage room, level 6 PA building. They will be kept there for 5 years to allow for verification/examination of the PhD, after which they will be destroyed.

8. **Other Outcomes or Issues (Continuing or Completed Projects)**
Outline any other issues or outcomes of relevance to the Ethics Committee, especially ethical issues that have arisen during the course of the project

Not applicable.

9. **Research Outcomes and Benefits (Completed Projects only)**
Outline any benefits and outcomes for the project (anticipated/not anticipated, including student course submissions, research publications to date or to be published, etc.)

Potential publications in the ISI journals with area of psychology, marketing and design.

10. **Declaration of Compliance**
We, the undersigned, certify continuing responsibility for the conduct of this research in accordance with the principles contained in the National Statement and any other conditions specified by the Human Research Ethics Committee of the University.

Name of Principal Investigator/Supervisor: Prof A Whitfield

Signature: [signature]
Date: 3-3-2011

Student Investigator (Required for HDR Projects): Azhari Md Hashim / Raja Ahmad Azmat

Signature: [signature]
Date: 2-3-2011

Please return the completed and signed form to: Swinburne Research, Research Ethics Officer (Mail H8)
08 February, 2011

Dear Mr Raja Ahmad,

**RE: CHANGE OF THESIS TITLE**

At its meeting held on 03/02/2011 the Higher Degrees Research Executive Committee approved your application to change your thesis title to:

"The Product Effect: Do Designed Products Convey Their Characteristics To Their Owner?"

Yours sincerely,

[Signature]

Prof Pam Green
Director for Graduate Studies
Swinburne Research
Tel: 9214 0224
Email: pam.green@swin.edu.au

cc. Prof Allan Whitfield
Chair, PhDs. Res. Comm.
APPENDIX B – PILOT TEST PAPER SURVEY QUESTIONNAIRE
Swinburne University of Technology  
Faculty of Design

Project Consent Information Statement

Customer Emotional Needs in Motorcycle and Car Design: a Cross Cultural Perspective

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 Professor Allan Whitfield. The Associate Investigator is Dr. Simon Jackson. Both are full-time staff members of the Faculty of Design. Student Investigator(s): Azhari Md Hashim, and Raja Ahmad Azmeer Raja Ahmad Effendi.

The project is called “Customer Emotional Needs in Motorcycle and Car Design: a Cross Cultural Perspective” and is a questionnaire for the 1st Year Faculty of Design Film and Television Students at Swinburne University and students at the Universiti teknologi MARA (UiTM), Kedah, Malaysia.

Successive Malaysian governments have pursued a vision of achieving “industrialized country” status by 2020. Within this, the transport industry has played a major role, receiving considerable internal investment and acting as a flagship for national ambition. An important sector of this industry comprises motorcycle manufacturers in Asian region, the main one being Modenas, and the car industry represented by Proton. As international competition increases, these companies risk a reduction in their share of the home market and curtailment of their export ambitions. The former is due to free trade tariff reductions, and the latter is due to Chine entering this particular market segment. The problem is not one of technical performance; rather, it appears to be one of styling of cars and motorbikes. The research will be cross-cultural involving surveys pf Malaysians and Australians, and will test for possible differences due to nationally and gender. It is intend that the research will have practical application within the automotive industries and make an academic contribution within the field of experimental aesthetics.

Privacy protection is of paramount concern. No participant names will be recorded on the questionnaire. The data will be analysed and represented in tables, charts and text 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.
By completing this survey you are allowing us to use this information for our research.

This survey is anonymous and no record will be made of your identity.
INTRODUCTION

This research is carried out by Raja Ahmad Azmeer, a doctoral student at the National Institute for Design Research, Swinburne University of Technology, Melbourne, Australia. Kindly complete the survey. Your cooperation is appreciated.

INSTRUCTIONS

1. Please complete all of the questions in the order in 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.

   Disagree 1 2 3 4 5 6 7 8 9 Agree

   Disagree 1 2 3 4 5 6 7 8 9 Agree

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

   In example b) the circle 6 indicates that you slightly agree that the person appears 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:

1. Your Age
   _____ years.

2. Your Gender
   a) Male  b) Female
In the above picture, a woman is with her car. 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 | Up to Technical & further Education (TAFE) | Up to Degree | Up to Post Graduate |

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

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

7. She is creative.
<p>| Disagree 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Agree |</p>
<table>
<thead>
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<th>7</th>
<th>8</th>
<th>9</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. She looks friendly.</td>
<td>Disagree</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>9. She looks unstable.</td>
<td>Disagree</td>
<td></td>
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<tr>
<td>10. She looks feminine.</td>
<td>Disagree</td>
<td></td>
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<tr>
<td>11. She looks trustworthy.</td>
<td>Disagree</td>
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<tr>
<td>12. She looks anxious.</td>
<td>Disagree</td>
<td></td>
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<tr>
<td>13. She is elegant.</td>
<td>Disagree</td>
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<tr>
<td>14. She looks sporty.</td>
<td>Disagree</td>
<td></td>
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</tbody>
</table>
15. She looks stylish.

Disagree 1 2 3 4 5 6 7 8 9 Agree

16. She looks open to new ideas.

Disagree 1 2 3 4 5 6 7 8 9 Agree

17. She is attractive.

Disagree 1 2 3 4 5 6 7 8 9 Agree

18. She appears generous.

Disagree 1 2 3 4 5 6 7 8 9 Agree

19. She looks reliable.

Disagree 1 2 3 4 5 6 7 8 9 Agree

20. She looks efficient.

Disagree 1 2 3 4 5 6 7 8 9 Agree

21. She looks organized.

Disagree 1 2 3 4 5 6 7 8 9 Agree
22. She appears kind.

| Disagree | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Agree |

23. She looks vulnerable.

| Disagree | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Agree |

I appreciate your time and cooperation. Please check to make sure that you have not skipped any questions inadvertently. Thank you.
In the above picture, a woman is with her car. 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  
   - Up to Technical & further Education (TAFE)  
   - Up to Degree  
   - Up to Post Graduate

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

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

7. She is creative.
   - Disagree  
   - 1  
   - 2  
   - 3  
   - 4  
   - 5  
   - 6  
   - 7  
   - 8  
   - 9  
   - Agree
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<td></td>
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<td></td>
<td></td>
<td>Agree</td>
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<td>9. She looks unstable.</td>
<td>Disagree</td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td>Agree</td>
</tr>
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<td>10. She looks feminine.</td>
<td>Disagree</td>
<td></td>
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<td>12. She looks anxious.</td>
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<td>Agree</td>
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<td>14. She looks sporty.</td>
<td>Disagree</td>
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<td></td>
<td></td>
<td>Agree</td>
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</table>
15. She looks stylish.
   Disagree  1  2  3  4  5  6  7  8  9  Agree

16. She looks open to new ideas.
   Disagree  1  2  3  4  5  6  7  8  9  Agree

17. She is attractive.
   Disagree  1  2  3  4  5  6  7  8  9  Agree

18. She appears generous.
   Disagree  1  2  3  4  5  6  7  8  9  Agree

19. She looks reliable.
   Disagree  1  2  3  4  5  6  7  8  9  Agree

20. She looks efficient.
   Disagree  1  2  3  4  5  6  7  8  9  Agree

21. She looks organized.
   Disagree  1  2  3  4  5  6  7  8  9  Agree
22. She appears kind.  
Disagree 1 2 3 4 5 6 7 8 9 Agree

23. She looks vulnerable.  
Disagree 1 2 3 4 5 6 7 8 9 Agree

I appreciate your time and cooperation. Please check to make sure that you have not skipped any questions inadvertently. Thank you.
In the above picture, a man is with his car. Can you please give your impression of him by answering the questions below:

1. How tall do you think he is? *(In cm)*
   - 140
   - 145
   - 150
   - 155
   - 160
   - 165
   - 170
   - 175
   - 180
   - 185
   - 190

2. How heavy do you think he is? *(In kg)*
   - 40
   - 45
   - 50
   - 55
   - 60
   - 65
   - 70
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   - 80
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   - 90
   - 95
   - 100

3. How old do you think he is?
   - _____ years.

4. What level of education did he achieve?
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5. What do you think his annual income will be?
   - 20k
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   - 60k
   - 70k
   - 80k
   - 90k
   - 100k

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

7. He is creative.
   - Disagree
   - 1
   - 2
   - 3
   - 4
   - 5
   - 6
   - 7
   - 8
   - 9
   - Agree
8. He looks friendly.
   Disagree 1 2 3 4 5 6 7 8 9 Agree

9. He looks unstable.
   Disagree 1 2 3 4 5 6 7 8 9 Agree

10. He looks masculine.
    Disagree 1 2 3 4 5 6 7 8 9 Agree

11. He looks trustworthy.
    Disagree 1 2 3 4 5 6 7 8 9 Agree

12. He looks anxious.
    Disagree 1 2 3 4 5 6 7 8 9 Agree

13. He is elegant.
    Disagree 1 2 3 4 5 6 7 8 9 Agree

14. He looks sporty.
    Disagree 1 2 3 4 5 6 7 8 9 Agree
15. He looks stylish.

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<th>Disagree</th>
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23. He looks vulnerable.

<table>
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   - 185
   - 190

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

7. He is creative.
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<td>10. He looks masculine.</td>
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<tr>
<td>11. He looks trustworthy.</td>
<td>Disagree</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<td>12. He looks anxious.</td>
<td>Disagree</td>
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<td>13. He is elegant.</td>
<td>Disagree</td>
<td>1</td>
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15. He looks stylish.

<table>
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<tr>
<th>Disagree</th>
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<th>2</th>
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<th>8</th>
<th>9</th>
<th>Agree</th>
</tr>
</thead>
</table>

16. He looks open to new ideas.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<th>6</th>
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<th>8</th>
<th>9</th>
<th>Agree</th>
</tr>
</thead>
</table>

17. He is attractive.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>1</th>
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<th>9</th>
<th>Agree</th>
</tr>
</thead>
</table>

18. He appears generous.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>1</th>
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<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>Agree</th>
</tr>
</thead>
</table>

19. He looks reliable.

<table>
<thead>
<tr>
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<th>6</th>
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<th>8</th>
<th>9</th>
<th>Agree</th>
</tr>
</thead>
</table>

20. He looks efficient.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>1</th>
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<th>7</th>
<th>8</th>
<th>9</th>
<th>Agree</th>
</tr>
</thead>
</table>

21. He looks organized.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>1</th>
<th>2</th>
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<th>7</th>
<th>8</th>
<th>9</th>
<th>Agree</th>
</tr>
</thead>
</table>
APPENDIX B

22. He appears kind.

Disagree 1 2 3 4 5 6 7 8 9 Agree

23. He looks vulnerable.

Disagree 1 2 3 4 5 6 7 8 9 Agree

I appreciate your time and cooperation. Please check to make sure that you have not skipped any questions inadvertently. Thank you.
Permohonan Persetujuan Bagi Mendapatkan Informasi Projek

Kehendak Pengguna Dari Segi Emosi Di dalam Rekabentuk Kereta dan Motosikal: Dari Perspektif Dua Budaya.

Anda dijemput untuk mengambil bahagian di dalam kajian projek yang dijalankan oleh Fakulti Rekabentuk, Swinburne University of Technology, Melbourne, Australia. Penyelidik utama ialah Profesor Allan Whitfield sementara penyelidik bersama ialah Dr. Simon Jackson. Kedua mereka adalah ahli staf Fakulti Rekabentuk di Swinburne University of Technology, Melbourne, Australia.

Tajuk projek ini “Kehendak Pengguna Dari Segi Emosi Di dalam Rekabentuk Kereta dan Motosikal: Dari Perspektif Dua Budaya”. Responden soalan kajiselidik adalah Pelajar Tahun Satu Fakulti Rekabentuk jurusan Rekabentuk Filem dan Televisyen di Swinburne University dan pelajar di Universiti Teknologi MARA Cawangan Merbok, Kedah Darul Ehsan, Malaysia.


Tinjauan ini dianggap sulit dan nama responden tidak akan direkodkan di dalam borang tinjauan. Segala data akan dianalisa dan dibentangkan dalam bentuk daftar fakta atau angka, carta dan teks untuk penerbitan oleh penyelidik di dalam artikel.

Setiap responden berhak untuk menarik diri daripada mengisi borang kajiselidik ketika tinjauan dijalankan sekiranya mereka tidak bersetuju untuk menjawab sebarang soalan di atas sebab-sebab yang tertentu.
Swinburne University of Technology
Faculty of Design

Borang Persetujuan


2. Bulatkan jawapan anda seperti berikut:
   - Saya bersetuju untuk melengkapkan borang kajiselidik mengenai kereta dan motosikal
   - Ya / Tidak

3. Saya sedar bahawa;
   a) kebarangkalian adanya kesan sampingan telah diterangkan berdasarkan persetujuan saya.
   b) penyerataan saya adalah secara sukarela dan saya berhak untuk menarik diri daripada mengisi borang kajiselidik ketika tinjauan dijalankan di atas sebab-sebab yang tertentu.
   c) projek ini adalah untuk tujuan penyelidikan dan bukan untuk meraih sebarang keuntungan;
   d) segala maklumat peribadi dan kesihatan yang menunjukkan penyertaan saya di dalam projek ini akan di (i) kumpul dan disimpan bagi tujuan projek ini dan (ii) dianalisa oleh penyelidik bagi tujuan untuk menjalankan projek ini.
   e) identiti saya tidak akan direkodkan di dalam penerbitan melainkan mendapat keizinan daripada saya iaitu dalam bentuk surat persetujuan.

Dengan menandatangani dokumen ini saya bersetuju untuk menyertai projek ini.

Nama Peserta:

..........................................................................................................................................................

Tandatangan dan Tarikh:

..........................................................................................................................................................

Nama Saksi (jika perlu):

..........................................................................................................................................................

Tandatangan dan Tarikh:

..........................................................................................................................................................
Projek ini telah diprilaku sah atau diwakili oleh „Swinburne‟s Human Research Ethics Committee‟ (SUHREC) bersama dengan „National Statement On Ethical Conduct In Human Research‟. Jika ada sebarang hal yang berkaitan dengan seseorang atau aduan mengenai cara tinjauan ini dijalankan, anda boleh hubungi: Research Ethics Officer, Swinburne Research (H68), Swinburne University of Technology, P O Box 218, HAWTHORN VIC 3122. Tel (03) 92145218 atau +61 3 92145218 atau resethics@swin.edu.au
Merujuk gambar diatas, seorang perempuan bersama kereta. Sila berikan gambaran anda terhadap perempuan tersebut dengan menjawab soalan-soalan dibawah.

(In the above picture, a woman is with her car. Can you please give your impression of her by answering the questions below)

1. Pada pendapat anda berapakah tinggi perempuan ini? (cm)
   
   \( \text{How tall do you think she is? (In cm)} \)

   145  150  155  160  165  170  175  180  185  190

2. Pada pendapat anda berapakah berat perempuan ini? (kg)
   
   \( \text{How heavy do you think she is? (In kg)} \)

   40  45  50  55  60  65  70  75  80  85  90  95  100

3. Pada pendapat anda berapakah umur perempuan ini?
   
   \( \text{How old do you think she is?} \)

   _____ tahun (years)

4. Pada pendapat anda apakah tahap pencapaian akademik perempuan ini?

   \( \text{What level of education did she achieve?} \)

   Tahap SPM  Tahap STPM  Tahap Diploma  Tahap Ijazah  Tahap Ijazah lanjutan
5. Pada pendapat anda berapakah pendapatan perempuan ini?

What do you think her annual income will be?

- 20k
- 30k
- 40k
- 50k
- 60k
- 70k
- 80k
- 90k
- 100k

6. Perempuan ini kelihatan mempunyai sikap positif dalam hidup.

She looks like she has a positive attitude to life.

Tidak setuju 1 2 3 4 5 6 7 8 9  Setuju

- Disagree
- Agree

7. Perempuan ini adalah seorang yang kreatif.

She is creative.

Tidak setuju 1 2 3 4 5 6 7 8 9  Setuju

- Disagree
- Agree

8. Perempuan ini kelihatan peramah.

She looks friendly.

Tidak setuju 1 2 3 4 5 6 7 8 9  Setuju

- Disagree
- Agree


She looks unstable.

Tidak setuju 1 2 3 4 5 6 7 8 9  Setuju

- Disagree
- Agree
She looks feminine.

<table>
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<tr>
<th>Tidak setuju</th>
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<th>Setuju</th>
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<tbody>
<tr>
<td>Disagree</td>
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<td></td>
<td></td>
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<td>Agree</td>
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</tbody>
</table>

She looks trustworthy.

<table>
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<td>Agree</td>
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</table>

She looks anxious.

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<td>Disagree</td>
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<td></td>
<td></td>
<td></td>
<td>Agree</td>
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</table>

13. Perempuan ini kelihatan anggun.  
She is elegant.

<table>
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<tr>
<td>Disagree</td>
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<td>Agree</td>
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</table>

*She looks sporty.*

<table>
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<tr>
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<td>Agree</td>
</tr>
</tbody>
</table>

15. Perempuan ini kelihatan bergaya.

*She looks stylish.*

<table>
<thead>
<tr>
<th>Tidak setuju</th>
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<tbody>
<tr>
<td>Disagree</td>
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<td></td>
<td></td>
<td></td>
<td>Agree</td>
</tr>
</tbody>
</table>

16. Perempuan ini kelihatan seperti seorang yang boleh menerima idea-idea baru.

*She looks open to new ideas.*

<table>
<thead>
<tr>
<th>Tidak setuju</th>
<th>1</th>
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<tr>
<td>Disagree</td>
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<td></td>
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<td></td>
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<td></td>
<td>Agree</td>
</tr>
</tbody>
</table>

17. Perempuan ini seorang yang menarik.

*She is attractive.*

<table>
<thead>
<tr>
<th>Tidak setuju</th>
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<tr>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td>Agree</td>
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</table>
18. Perempuan ini kelihatan pemurah.

She appears generous.

<table>
<thead>
<tr>
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<td></td>
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<td></td>
<td></td>
<td>Agree</td>
</tr>
</tbody>
</table>


She looks reliable.

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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Agree</td>
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</table>

20. Perempuan ini kelihatan seperti seorang yang cekap.

She looks efficient.

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<tbody>
<tr>
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<td>Agree</td>
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She looks organized.

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<td></td>
<td></td>
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<td>Agree</td>
</tr>
</tbody>
</table>
22. Perempuan ini kelihatan seperti seorang yang baik hati.

She appears kind.

<table>
<thead>
<tr>
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<td>Agree</td>
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</table>

23. Perempuan ini kelihatan seperti seorang yang mudah tersinggung.

She looks vulnerable.

<table>
<thead>
<tr>
<th>Tidak setuju</th>
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</table>


I appreciate your time and cooperation. Please check to make sure that you have not skipped any questions inadvertently. Thank you.
Merujuk gambar diatas, seorang perempuan bersama kereta. Sila berikan gambaran anda terhadap perempuan tersebut dengan menjawab soalan-soalan dibawah.

(In the above picture, a woman is with her car. Can you please give your impression of her by answering the questions below)

1. Pada pendapat anda berapakah tinggi perempuan ini? (cm)

   How tall do you think she is? (In cm)

   145 150 155 160 165 170 175 180 185 190

2. Pada pendapat anda berapakah berat perempuan ini? (kg)

   How heavy do you think she is? (In kg)

   40 45 50 55 60 65 70 75 80 85 90 95 100

3. Pada pendapat anda berapakah umur perempuan ini?

   How old do you think she is?

   _____ tahun (years)

4. Pada pendapat anda apakah tahap pencapaian akademik perempuan ini?

   What level of education did she achieve?

   Tahap SPM   Tahap STPM   Tahap Diploma   Tahap Ijazah   Tahap Ijazah lanjutan
5. Pada pendapat anda berapakah pendapatan perempuan ini?

*What do you think her annual income will be?*

<table>
<thead>
<tr>
<th></th>
<th>20k</th>
<th>30k</th>
<th>40k</th>
<th>50k</th>
<th>60k</th>
<th>70k</th>
<th>80k</th>
<th>90k</th>
<th>100k</th>
</tr>
</thead>
</table>

6. Perempuan ini kelihatan mempunyai sikap positif dalam hidup.

*She looks like she has a positive attitude to life.*

<table>
<thead>
<tr>
<th>Tidak setuju</th>
<th>1</th>
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7. Perempuan ini adalah seorang yang kreatif.

*She is creative.*

<table>
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8. Perempuan ini kelihatan peramah.

*She looks friendly.*

<table>
<thead>
<tr>
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<th>2</th>
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*She looks unstable.*

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*She looks feminine.*

<table>
<thead>
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<td>Agree</td>
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</table>


*She looks trustworthy.*

<table>
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<td>Disagree</td>
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<td>Agree</td>
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</table>


*She looks anxious.*

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</table>

13. Perempuan ini kelihatan anggun.

*She is elegant.*

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</table>
She looks sporty.

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15. Perempuan ini kelihatan bergaya.
She looks stylish.

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16. Perempuan ini kelihatan seperti seorang yang boleh menerima idea-idea baru.
She looks open to new ideas.

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17. Perempuan ini seorang yang menarik.
She is attractive.

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18. Perempuan ini kelihatan pemurah.

*She appears generous.*

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*She looks reliable*

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20. Perempuan ini kelihatan seperti seorang yang cekap.

*She looks efficient.*

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*She looks organized.*

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22. Perempuan ini kelihatan seperti seorang yang baik hati.

*She appears kind.*

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23. Perempuan ini kelihatan seperti seorang yang mudah tersinggung.

*She looks vulnerable.*

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*I appreciate your time and cooperation. Please check to make sure that you have not skipped any questions inadvertently. Thank you.*
Merujuk gambar diatas, seorang lelaki bersama kereta. Sila berikan gambaran anda terhadap lelaki tersebut dengan menjawab soalan-soalan dibawah.

(In the above picture, a man is with her car. Can you please give your impression of his by answering the questions below)

1. Pada pendapat anda berapakah tinggi lelaki ini? (cm)

How tall do you think he is? (In cm)

145 150 155 160 165 170 175 180 185 190

2. Pada pendapat anda berapakah berat lelaki ini? (kg)

How heavy do you think he is? (In kg)

40 45 50 55 60 65 70 75 80 85 90 95 100

3. Pada pendapat anda berapakah umur lelaki ini?

How old do you think he is?

_____ tahun (years)

4. Pada pendapat anda apakah tahap pencapaian akademik lelaki ini?

What level of education did he achieve?

Tahap SPM Tahap STPM Tahap Diploma Tahap Ijazah Tahap Ijazah lanjutan
5. Pada pendapat anda berapakah pendapatan lelaki ini?

What do you think his annual income will be?

20k 30k 40k 50k 60k 70k 80k 90k 100k


He looks like he has a positive attitude to life.

Tidak setuju 1 2 3 4 5 6 7 8 9 Setuju

Disagree Agree

7. Lelaki ini adalah seorang yang kreatif.

He is creative.

Tidak setuju 1 2 3 4 5 6 7 8 9 Setuju

Disagree Agree

8. Lelaki ini kelihatan peramah.

He looks friendly.

Tidak setuju 1 2 3 4 5 6 7 8 9 Setuju

Disagree Agree


He looks unstable.

Tidak setuju 1 2 3 4 5 6 7 8 9 Setuju

Disagree Agree
10. Lelaki ini bersifat maskulin.

He looks masculine.

Tidak setuju  1  2  3  4  5  6  7  8  9  Setuju

Disagree  Agree

11. Lelaki ini kelihatan seperti boleh dipercayai.

He looks trustworthy.

Tidak setuju  1  2  3  4  5  6  7  8  9  Setuju

Disagree  Agree

12. Lelaki ini kelihatan cemas.

He looks anxious.

Tidak setuju  1  2  3  4  5  6  7  8  9  Setuju

Disagree  Agree

13. Lelaki ini kelihatan anggun.

He is elegant.

Tidak setuju  1  2  3  4  5  6  7  8  9  Setuju

Disagree  Agree

*He looks sporty.*

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| Disagree     |   |   |   |   |   |   |   |   |   | Agree  

15. Lelaki ini kelihatan bergaya.

*He looks stylish.*

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| Disagree     |   |   |   |   |   |   |   |   |   | Agree  

16. Lelaki ini kelihatan seperti seorang yang boleh menerima idea-idea baru.

*He looks open to new ideas.*

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| Disagree     |   |   |   |   |   |   |   |   |   | Agree  

17. Lelaki ini seorang yang menarik.

*He is attractive.*

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241
18. Lelaki ini kelihatan pemurah.

*He appears generous.*

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19. He ini kelihatan seperti seorang yang bertanggungjawab.

*He looks reliable*

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20. Lelaki ini kelihatan seperti seorang yang cekap.

*He looks efficient.*

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<td>Agree</td>
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21. He ini kelihatan seperti seorang yang teratur.

*He looks organized.*

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22. He ini kelihatan seperti seorang yang baik hati.

*He appears kind.*

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23. He ini kelihatan seperti seorang yang mudah tersinggung.

*He looks vulnerable.*

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2. Pada pendapat anda berapakah berat lelaki ini? (kg)

   How heavy do you think he is? (In kg)
   
   40  45  50  55  60  65  70  75  80  85  90  95  100

3. Pada pendapat anda berapakah umur lelaki ini?

   How old do you think he is?
   
   ______ tahun (years)

4. Pada pendapat anda apakah tahap pencapaian akademik lelaki ini?

   What level of education did he achieve?
   
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5. Pada pendapat anda berapakah pendapatan lelaki ini?

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He looks like he has a positive attitude to life.

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Disagree Agree

7. Lelaki ini adalah seorang yang kreatif.

He is creative.

Tidak setuju 1 2 3 4 5 6 7 8 9 Setuju

Disagree Agree

8. Lelaki ini kelihatan peramah.

He looks friendly.

Tidak setuju 1 2 3 4 5 6 7 8 9 Setuju

Disagree Agree


He looks unstable.

Tidak setuju 1 2 3 4 5 6 7 8 9 Setuju

Disagree Agree
10. Lelaki ini bersifat maskulin.

*He looks masculine.*

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Disagree  Agree

11. Lelaki ini kelihatan seperti boleh dipercayai.

*He looks trustworthy.*

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Disagree  Agree

12. Lelaki ini kelihatan cemas.

*He looks anxious.*

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<th>Tidak setuju</th>
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</tbody>
</table>

Disagree  Agree

13. Lelaki ini kelihatan anggun.

*He is elegant.*

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<thead>
<tr>
<th>Tidak setuju</th>
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</tbody>
</table>

Disagree  Agree

He looks sporty.

<table>
<thead>
<tr>
<th>Tidak setuju</th>
<th>1</th>
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<tr>
<td>Disagree</td>
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<td></td>
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<td></td>
<td>Agree</td>
</tr>
</tbody>
</table>

15. Lelaki ini kelihatan bergaya.

He looks stylish.

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<thead>
<tr>
<th>Tidak setuju</th>
<th>1</th>
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<th>Setuju</th>
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</thead>
<tbody>
<tr>
<td>Disagree</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>Agree</td>
</tr>
</tbody>
</table>

16. Lelaki ini kelihatan seperti seorang yang boleh menerima idea-idea baru.

He looks open to new ideas.

<table>
<thead>
<tr>
<th>Tidak setuju</th>
<th>1</th>
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<tr>
<td>Disagree</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td>Agree</td>
</tr>
</tbody>
</table>

17. Lelaki ini seorang yang menarik.

He is attractive.

<table>
<thead>
<tr>
<th>Tidak setuju</th>
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<th>4</th>
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<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Agree</td>
</tr>
</tbody>
</table>
18. Lelaki ini kelihatan pemurah.

He appears generous.

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

19. He ini kelihatan seperti seorang yang bertanggungjawab.

He looks reliable.

<table>
<thead>
<tr>
<th>Tidak setuju</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<td></td>
<td></td>
<td></td>
<td>Agree</td>
</tr>
</tbody>
</table>

20. Lelaki ini kelihatan seperti seorang yang cekap.

He looks efficient.

<table>
<thead>
<tr>
<th>Tidak setuju</th>
<th>1</th>
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<th>4</th>
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<td></td>
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<td></td>
<td>Agree</td>
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</tbody>
</table>

21. He ini kelihatan seperti seorang yang teratur.

He looks organized.

<table>
<thead>
<tr>
<th>Tidak setuju</th>
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<th>4</th>
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<td>Disagree</td>
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<td></td>
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<td></td>
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<td>Agree</td>
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</tbody>
</table>
22. He ini kelihatan seperti seorang yang baik hati.  

*He appears kind.*

<table>
<thead>
<tr>
<th>Tidak setuju</th>
<th>1</th>
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<td><em>Disagree</em></td>
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<td></td>
<td></td>
<td></td>
<td><em>Agree</em></td>
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</table>

23. He ini kelihatan seperti seorang yang mudah tersinggung.

*He looks vulnerable.*

<table>
<thead>
<tr>
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<td></td>
<td></td>
<td><em>Agree</em></td>
</tr>
</tbody>
</table>


*I appreciate your time and cooperation. Please check to make sure that you have not skipped any questions inadvertently. Thank you.*
Ethics Clearance

Ethics Clearance:

You are invited to participate in a survey conducted by a Swinburne Research student about the perception of car design. Feel free to answer a few quick questions while your tutorial downloads.

Research Student: Doctorate, Raja A Azmeer
Research Supervisors: Prof Allan Whitfield and Dr Simon Jackson

Project Title: The Role of Perception in Car Design. Focusing on the Malaysian and Australian Consumer

Malaysia is unique within the Islamic world of developing a motor car industry that is geared towards both internal and export markets. After initial success, its export performance has failed to match that of its international competitors. This failure is not in technical performance, but appears to be in the styling of its models. The research to be undertaken will investigate how people perceive Malaysian-made car models against their main rivals. It will use a technique derived from environmental psychology that captures the effect the design of the room has upon the perception of its occupant. Its application to cars will measure the car’s effect upon perceptions of its owner. The research will be cross-cultural, involving surveys of both Malaysians and Australians, and will test for possible differences due to nationality and gender. The application of this technique is new to the car industry. The results will have both practical application to the car industry and academic significance within the field of experimental aesthetics.

If you are 18 years or over you are invited to participate in this study

If you would like to participate, please complete this questionnaire. You will be shown randomized images of a male and female model, who are shown with car design. You will be asked to perceive personality traits and demographic aspects of the models. The affect that different car design has on the differences and similarities in how males and females perceive each other and members of the same gender will be focused on.

Privacy protection is of paramount concern. You will only need to include your gender and birth date on the questionnaire but no participant names will be recorded on the questionnaire, so you will remain anonymous.

The data will be analyzed and represented in tables, charts and text as part of a thesis that fulfils the assessment requirements for the Doctor of Philosophy (PhD) and may be published in academic journals.

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

Your completion and submission of the questionnaire constitutes consent. Completion of only part of the questionnaire also constitutes your consent to use the individual questions you have answered.
For further enquiries contact Professor Allan Whitfield
Deputy Dean Research
The National Institute for Design Research
The Faculty of Design
Building PA 144 High Street
PRAHRAN. VIC 3181. AUSTRALIA
Phone: +61 3 9214 6882

This project has been approved by or on behalf of Swinburne’s Human Research Ethics Committee (SUHREC) in line with the National Statement on Ethical Conduct in Human Research. If you have any concerns or complaints about the conduct of this project, you can contact: Research Ethics Officer, Swinburne Research (H68), Swinburne University of Technology, P O Box 218, HAWTHORN VIC 3122.
Tel (03) 92145218 or +61 3 92145218 or resethics@swin.edu.au

Thank you for your interest in this study.
Raja A Azmeer, Allan Whitfield and Simon Jackson
I agree to the above terms  I do not agree to the above terms

Question 1/18

How tall do you think she is? (In cm)

☐ 140  ☐ 145  ☐ 150  ☐ 155  ☐ 160  ☐ 165  ☐ 170  ☐ 175  ☐ 180
☐ 185  ☐ 190

Question 2/18

How heavy do you think she is? (In kg)

☐ 40  ☐ 45  ☐ 50  ☐ 55  ☐ 60  ☐ 65  ☐ 70  ☐ 75  ☐ 80  ☐ 85  ☐ 90
☐ 95  ☐ 100
Question 3/18

How old do you think she is?

Enter your answer below:

Question 4/18

What level of education did she achieve?

- Up to Year 9
- Up to Year 12
- Up to Technical & Further Education (TAFE)
- Up to Degree
- Up to Post Graduate

Question 5/18

What do you think her annual income will be?

- 20k
- 30k
- 40k
- 50k
- 60k
- 70k
- 80k
- 90k
- 100k

Question 6/18

On a scale of 1 to 9 (1 being 'disagree' and 9 being 'agree'), please consider the following 11 statements:

She looks like she has a positive attitude to life.

- 1 (Disagree)
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9 (Agree)

Question 7/18

She is creative.

- 1 (Disagree)
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9 (Agree)

Question 8/18

She looks feminine.

- 1 (Disagree)
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9 (Agree)
Question 9/18

She looks trustworthy.

〇 1 (Disagree) 〇 2 〇 3 〇 4 〇 5 〇 6 〇 7 〇 8 〇 9 (Agree)

Question 10/18

She looks elegant.

〇 1 (Disagree) 〇 2 〇 3 〇 4 〇 5 〇 6 〇 7 〇 8 〇 9 (Agree)

Question 11/18

She looks stylish.

〇 1 (Disagree) 〇 2 〇 3 〇 4 〇 5 〇 6 〇 7 〇 8 〇 9 (Agree)

Question 12/18

She is attractive.

〇 1 (Disagree) 〇 2 〇 3 〇 4 〇 5 〇 6 〇 7 〇 8 〇 9 (Agree)

Question 13/18

She appears generous.

〇 1 (Disagree) 〇 2 〇 3 〇 4 〇 5 〇 6 〇 7 〇 8 〇 9 (Agree)

Question 14/18

She looks reliable.

〇 1 (Disagree) 〇 2 〇 3 〇 4 〇 5 〇 6 〇 7 〇 8 〇 9 (Agree)

Question 15/18

She looks efficient.

〇 1 (Disagree) 〇 2 〇 3 〇 4 〇 5 〇 6 〇 7 〇 8 〇 9 (Agree)
Question 16/18

She looks organized.

☐ 1 (Disagree)  ☐ 2  ☐ 3  ☐ 4  ☐ 5  ☐ 6  ☐ 7  ☐ 8  ☐ 9 (Agree)

Question 17/18

Thank you. Please choose your age.

☐ Under 20  ☐ 20-29  ☐ 30-39  ☐ 40-49  ☐ 50-59  ☐ 60 or above

Question 18/18

What is your gender?

☐ Male  ☐ Female

Survey completed
Thank you for taking part.
For your chance to win an 8Gb iPod touch (3rd Generation) valued at $268 RRP, please submit your email address.

Email: ____________________________
Question 1/18

In the picture above, a woman is with her car. Can you give your impression of her by answering the question?

How tall do you think she is? (In cm)

- 140
- 145
- 150
- 155
- 160
- 165
- 170
- 175
- 180
- 185
- 190

Question 2/18

How heavy do you think she is? (In kg)

- 40
- 45
- 50
- 55
- 60
- 65
- 70
- 75
- 80
- 85
- 90
- 95
- 100

Question 3/18

How old do you think she is?

Enter your answer below:

Question 4/18

What level of education did she achieve?

- Up to Year 9
- Up to Year 12
- Up to Technical & Further Education (TAFE)
- Up to Degree
- Up to Post Graduate
Question 5/18
What do you think her annual income will be?
☐ 20k  ☐ 30k  ☐ 40k  ☐ 50k  ☐ 60k  ☐ 70k  ☐ 80k  ☐ 90k
☐ 100k

Question 6/18
On a scale of 1 to 9 (1 being 'disagree' and 9 being 'agree'), please consider the following 11 statements:

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

Question 7/18
She is creative.
☐ 1 (Disagree)  ☐ 2  ☐ 3  ☐ 4  ☐ 5  ☐ 6  ☐ 7  ☐ 8  ☐ 9 (Agree)

Question 8/18
She looks feminine.
☐ 1 (Disagree)  ☐ 2  ☐ 3  ☐ 4  ☐ 5  ☐ 6  ☐ 7  ☐ 8  ☐ 9 (Agree)

Question 9/18
She looks trustworthy.
☐ 1 (Disagree)  ☐ 2  ☐ 3  ☐ 4  ☐ 5  ☐ 6  ☐ 7  ☐ 8  ☐ 9 (Agree)

Question 10/18
She looks elegant.
☐ 1 (Disagree)  ☐ 2  ☐ 3  ☐ 4  ☐ 5  ☐ 6  ☐ 7  ☐ 8  ☐ 9 (Agree)
Question 11/18

She looks stylish.

☐ 1 (Disagree) ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 (Agree)

Question 12/18

She is attractive.

☐ 1 (Disagree) ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 (Agree)

Question 13/18

She appears generous.

☐ 1 (Disagree) ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 (Agree)

Question 14/18

She looks reliable.

☐ 1 (Disagree) ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 (Agree)

Question 15/18

She looks efficient.

☐ 1 (Disagree) ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 (Agree)

Question 16/18

She looks organized.

☐ 1 (Disagree) ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 (Agree)

Question 17/18

Thank you. Please choose your age.

☐ Under 20 ☐ 20-29 ☐ 30-39 ☐ 40-49 ☐ 50-59 ☐ 60 or above
Question 18/18

**What is your gender?**

☐ Male ☐ Female

**Survey completed**
Thank you for taking part.
For your chance to win an 8Gb iPod touch (3rd Generation) valued at $268 RRP, please submit your email address.

Email: ____________________________
Question 1/18

How tall do you think he is? (In cm)
- 140
- 145
- 150
- 155
- 160
- 165
- 170
- 175
- 180
- 185
- 190

Question 2/18

How heavy do you think he is? (In kg)
- 40
- 45
- 50
- 55
- 60
- 65
- 70
- 75
- 80
- 85
- 90
- 95
- 100

Question 3/18

How old do you think he is?

Enter your answer below:

Question 4/18

What level of education did he achieve?
- Up to Year 9
- Up to Year 12
- Up to Technical & Further Education (TAFE)
- Up to Degree
- Up to Post Graduate
Question 5/18

What do you think his annual income will be?

☐ 20k  ☐ 30k  ☐ 40k  ☐ 50k  ☐ 60k  ☐ 70k  ☐ 80k  ☐ 90k
☐ 100k

Question 6/18

On a scale of 1 to 9 (1 being 'disagree' and 9 being 'agree'), please consider the following 11 statements:

He looks like he has a positive attitude to life.

☐ 1 (Disagree)  ☐ 2  ☐ 3  ☐ 4  ☐ 5  ☐ 6  ☐ 7  ☐ 8  ☐ 9 (Agree)

Question 7/18

He is creative.

☐ 1 (Disagree)  ☐ 2  ☐ 3  ☐ 4  ☐ 5  ☐ 6  ☐ 7  ☐ 8  ☐ 9 (Agree)

Question 8/18

He looks masculine.

☐ 1 (Disagree)  ☐ 2  ☐ 3  ☐ 4  ☐ 5  ☐ 6  ☐ 7  ☐ 8  ☐ 9 (Agree)

Question 9/18

He looks trustworthy.

☐ 1 (Disagree)  ☐ 2  ☐ 3  ☐ 4  ☐ 5  ☐ 6  ☐ 7  ☐ 8  ☐ 9 (Agree)

Question 10/18

He looks elegant.

☐ 1 (Disagree)  ☐ 2  ☐ 3  ☐ 4  ☐ 5  ☐ 6  ☐ 7  ☐ 8  ☐ 9 (Agree)
Question 11/18

He looks stylish.

1 (Disagree) 2 3 4 5 6 7 8 9 (Agree)

Question 12/18

He is attractive.

1 (Disagree) 2 3 4 5 6 7 8 9 (Agree)

Question 13/18

He appears generous.

1 (Disagree) 2 3 4 5 6 7 8 9 (Agree)

Question 14/18

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1 (Disagree) 2 3 4 5 6 7 8 9 (Agree)

Question 15/18

He looks efficient.

1 (Disagree) 2 3 4 5 6 7 8 9 (Agree)

Question 16/18

He looks organized.

1 (Disagree) 2 3 4 5 6 7 8 9 (Agree)

Question 17/18

Thank you. Please choose your age.

Under 20 20-29 30-39 40-49 50-59 60 or above
Question 18/18

What is your gender?

☐ Male  ☐ Female

Survey completed
Thank you for taking part.
For your chance to win an 8Gb iPod touch (3rd Generation) valued at $268 RRP, please submit your email address.

Email: ____________________________
Question 1/18

In the picture above, a man is with his car. Can you give your impression of him by answering the question?

**How tall do you think he is? (In cm)**
- 140
- 145
- 150
- 155
- 160
- 165
- 170
- 175
- 180
- 185
- 190

Question 2/18

**How heavy do you think he is? (In kg)**
- 40
- 45
- 50
- 55
- 60
- 65
- 70
- 75
- 80
- 85
- 90
- 95
- 100

Question 3/18

**How old do you think he is?**

Enter your answer below:

Question 4/18

**What level of education did he achieve?**

- Up to Year 9
- Up to Year 12
- Up to Technical & Further Education (TAFE)
- Up to Degree
- Up to Post Graduate
Question 5/18

What do you think his annual income will be?

- 20k  
- 30k  
- 40k  
- 50k  
- 60k  
- 70k  
- 80k  
- 90k  
- 100k  

Question 6/18

On a scale of 1 to 9 (1 being 'disagree' and 9 being 'agree'), please consider the following 11 statements:

He looks like he has a positive attitude to life.

- 1 (Disagree)  2  3  4  5  6  7  8  9 (Agree)

Question 7/18

He is creative.

- 1 (Disagree)  2  3  4  5  6  7  8  9 (Agree)

Question 8/18

He looks masculine.

- 1 (Disagree)  2  3  4  5  6  7  8  9 (Agree)

Question 9/18

He looks trustworthy.

- 1 (Disagree)  2  3  4  5  6  7  8  9 (Agree)

Question 10/18

He looks elegant.

- 1 (Disagree)  2  3  4  5  6  7  8  9 (Agree)
Question 11/18

He looks stylish.

☐ 1 (Disagree) ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 (Agree)

Question 12/18

He is attractive.

☐ 1 (Disagree) ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 (Agree)

Question 13/18

He appears generous.

☐ 1 (Disagree) ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 (Agree)

Question 14/18

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☐ 1 (Disagree) ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 (Agree)

Question 17/18

Thank you. Please choose your age.

☐ Under 20 ☐ 20-29 ☐ 30-39 ☐ 40-49 ☐ 50-59 ☐ 60 or above
Question 18/18

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☐ Male  ☐ Female

Survey completed
Thank you for taking part.
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Email: ____________________________
Question 1/18

How tall do you think she is? (In cm)

☐ 140  ☐ 145  ☐ 150  ☐ 155  ☐ 160  ☐ 165  ☐ 170  ☐ 175  ☐ 180  
☐ 185  ☐ 190

Question 2/18

How heavy do you think she is? (In kg)

☐ 40  ☐ 45  ☐ 50  ☐ 55  ☐ 60  ☐ 65  ☐ 70  ☐ 75  ☐ 80  ☐ 85  ☐ 90  
☐ 95  ☐ 100

Question 3/18

How old do you think she is?

Enter your answer below:


Question 4/18

What level of education did she achieve?

☐ Up to Year 9  ☐ Up to Year 12  
☐ Up to Technical & Further Education (TAFE)  ☐ Up to Degree  
☐ Up to Post Graduate
Question 5/18

What do you think her annual income will be?

- 20k  
- 30k  
- 40k  
- 50k  
- 60k  
- 70k  
- 80k  
- 90k  
- 100k  

Question 6/18

On a scale of 1 to 9 (1 being 'disagree' and 9 being 'agree'), please consider the following 11 statements:

She looks like she has a positive attitude to life.

- 1 (Disagree)  
- 2  
- 3  
- 4  
- 5  
- 6  
- 7  
- 8  
- 9 (Agree)  

Question 7/18

She is creative.

- 1 (Disagree)  
- 2  
- 3  
- 4  
- 5  
- 6  
- 7  
- 8  
- 9 (Agree)  

Question 8/18

She looks feminine.

- 1 (Disagree)  
- 2  
- 3  
- 4  
- 5  
- 6  
- 7  
- 8  
- 9 (Agree)  

Question 9/18

She looks trustworthy.

- 1 (Disagree)  
- 2  
- 3  
- 4  
- 5  
- 6  
- 7  
- 8  
- 9 (Agree)  

Question 10/18

She looks elegant.

- 1 (Disagree)  
- 2  
- 3  
- 4  
- 5  
- 6  
- 7  
- 8  
- 9 (Agree)
Question 11/18

She looks stylish.

☐ 1 (Disagree)  ☐ 2   ☐ 3   ☐ 4   ☐ 5   ☐ 6   ☐ 7   ☐ 8   ☐ 9 (Agree)

Question 12/18

She is attractive.

☐ 1 (Disagree)  ☐ 2   ☐ 3   ☐ 4   ☐ 5   ☐ 6   ☐ 7   ☐ 8   ☐ 9 (Agree)

Question 13/18

She appears generous.

☐ 1 (Disagree)  ☐ 2   ☐ 3   ☐ 4   ☐ 5   ☐ 6   ☐ 7   ☐ 8   ☐ 9 (Agree)

Question 14/18

She looks reliable.

☐ 1 (Disagree)  ☐ 2   ☐ 3   ☐ 4   ☐ 5   ☐ 6   ☐ 7   ☐ 8   ☐ 9 (Agree)

Question 15/18

She looks efficient.

☐ 1 (Disagree)  ☐ 2   ☐ 3   ☐ 4   ☐ 5   ☐ 6   ☐ 7   ☐ 8   ☐ 9 (Agree)

Question 16/18

She looks organized.

☐ 1 (Disagree)  ☐ 2   ☐ 3   ☐ 4   ☐ 5   ☐ 6   ☐ 7   ☐ 8   ☐ 9 (Agree)

Question 17/18

Thank you. Please choose your age.

☐ Under 20  ☐ 20-29   ☐ 30-39   ☐ 40-49   ☐ 50-59   ☐ 60 or above
Question 18/18

What is your gender?

☐ Male  ☐ Female

Survey completed
Thank you for taking part.
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Email: __________________________
APPENDIX C

Question 1/18

In the picture above, a woman is with her car. Can you give your impression of her by answering the question?

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

Question 2/18

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

Question 3/18

How old do you think she is?

Enter your answer below:

Question 4/18

What level of education did she achieve?
- Up to Year 9
- Up to Year 12
- Up to Technical & Further Education (TAFE)
- Up to Degree
- Up to Post Graduate
Question 5/18

What do you think her annual income will be?

☐ 20k  ☐ 30k  ☐ 40k  ☐ 50k  ☐ 60k  ☐ 70k  ☐ 80k  ☐ 90k
☐ 100k

Question 6/18

On a scale of 1 to 9 (1 being 'disagree' and 9 being 'agree'), please consider the following 11 statements:

She looks like she has a positive attitude to life.

☐ 1 (Disagree)  ☐ 2  ☐ 3  ☐ 4  ☐ 5  ☐ 6  ☐ 7  ☐ 8  ☐ 9 (Agree)

Question 7/18

She is creative.

☐ 1 (Disagree)  ☐ 2  ☐ 3  ☐ 4  ☐ 5  ☐ 6  ☐ 7  ☐ 8  ☐ 9 (Agree)

Question 8/18

She looks feminine.

☐ 1 (Disagree)  ☐ 2  ☐ 3  ☐ 4  ☐ 5  ☐ 6  ☐ 7  ☐ 8  ☐ 9 (Agree)

Question 9/18

She looks trustworthy.

☐ 1 (Disagree)  ☐ 2  ☐ 3  ☐ 4  ☐ 5  ☐ 6  ☐ 7  ☐ 8  ☐ 9 (Agree)

Question 10/18

She looks elegant.

☐ 1 (Disagree)  ☐ 2  ☐ 3  ☐ 4  ☐ 5  ☐ 6  ☐ 7  ☐ 8  ☐ 9 (Agree)
Question 11/18

**She looks stylish.**

○ 1 (Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 (Agree)

Question 12/18

**She is attractive.**

○ 1 (Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 (Agree)

Question 13/18

**She appears generous.**

○ 1 (Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 (Agree)

Question 14/18

**She looks reliable.**

○ 1 (Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 (Agree)

Question 15/18

**She looks efficient.**

○ 1 (Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 (Agree)

Question 16/18

**She looks organized.**

○ 1 (Disagree) ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 (Agree)

Question 17/18

**Thank you. Please choose your age.**

○ Under 20 ○ 20-29 ○ 30-39 ○ 40-49 ○ 50-59 ○ 60 or above
Question 18/18

What is your gender?

☐ Male  ☐ Female

Survey completed
Thank you for taking part.
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Email: ___________________________
Question 1/18

How tall do you think he is? (In cm)
- 140
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Question 2/18

How heavy do you think he is? (In kg)
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- 85
- 90
- 95
- 100

Question 3/18

How old do you think he is?
Enter your answer below:

Question 4/18

What level of education did he achieve?
- Up to Year 9
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- Up to Degree
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Question 5/18

What do you think his annual income will be?

- 20k  
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Question 6/18

On a scale of 1 to 9 (1 being 'disagree' and 9 being 'agree'), please consider the following 11 statements:

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- 1 (Disagree)  
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Question 7/18

He is creative.

- 1 (Disagree)  
- 2  
- 3  
- 4  
- 5  
- 6  
- 7  
- 8  
- 9 (Agree)

Question 8/18

He looks masculine.

- 1 (Disagree)  
- 2  
- 3  
- 4  
- 5  
- 6  
- 7  
- 8  
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Question 9/18

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- 1 (Disagree)  
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Question 11/18

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He appears generous.

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Question 15/18

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Question 16/18

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Question 17/18

Thank you. Please choose your age.

☐ Under 20 ☐ 20-29 ☐ 30-39 ☐ 40-49 ☐ 50-59 ☐ 60 or above
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○ Male ○ Female

Survey completed
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○ 20k  ○ 30k  ○ 40k  ○ 50k  ○ 60k  ○ 70k  ○ 80k  ○ 90k
○ 100k

Question 6/18
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Question 8/18
He looks masculine.
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Question 10/18
He looks elegant.
○ 1 (Disagree)  ○ 2  ○ 3  ○ 4  ○ 5  ○ 6  ○ 7  ○ 8  ○ 9 (Agree)
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Question 12/18

He is attractive.

☐ 1 (Disagree) ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 (Agree)

Question 13/18

He appears generous.

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Question 14/18

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Question 17/18

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Question 18/18

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Survey completed
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Email: __________________________
PUBLICATIONS ARISING FROM THIS THESIS

1. Author of a conference proceeding entitled: „The Product Effect: a new technique for automotive market research”
   Conference name: Cumulus Conference: 38º South: Hemispheric Shifts Across Learning, Teaching and Research
   Conference location: Melbourne, Australia
   Date: 12-14 November 2009

2. Co-author of a conference proceeding entitled: „Multi Dimensional Scaling: an interactive method for establishing perceptions of the appearance of products”
   Conference name: Cumulus Conference: 38º South: Hemispheric Shifts Across Learning, Teaching and Research
   Conference location: Melbourne, Australia
   Date: 12-14 November 2009

3. Co-author of a conference proceeding entitled: „Designer roles in research perceptions of product appearances”
   Conference name: Conference on Arts, Social Sciences & Technology 2010
   Conference location: Penang, Malaysia
   Date: 24-25 February 2010