



THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

**How Consumers Perceive, Process and Respond to Innovativeness:
An Examination of Consumer Perceived Brand Innovativeness**

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Bachelor of Business Administration

Master of Business Administration (Marketing Major)

A thesis submitted for the degree of Doctor of Philosophy at

The University of Queensland in 2014

UQ Business School

Abstract

As a source of sustainable competitive advantage, a brand is the most important intangible asset of a firm (Keller, 2013). A brand not only serves as an encoding cue for brand-related information such as understanding of a new product's characteristics (Keller, 1993), but also serves as a powerful heuristic cue for evaluations and choice decisions (Park & Lessing, 1981). Each year, corporations collectively spend billions of dollars to promote the perception that their brands are innovative and that they regularly introduce product innovations to the marketplace. While these companies obviously view the "innovativeness" image to be commercially beneficial for their brands and actively pursue higher levels of consumer perceived brand innovativeness, the literature provides little empirical evidence to evaluate the validity of such a viewpoint. Much of the innovation literature centres on the tangible impact that new product development programs may have on outcomes of product innovation (Henard & Dacin, 2010), leaving less tangible facets of innovation, such as brand innovativeness relatively unexplored. To address this research gap, a programmatic three-step multi-method investigation including eight successive studies was conducted.

In the first phase, upon identification of the limitations of *product* and *firm* innovativeness conceptualisations with regard to *brand* innovativeness, the Consumer Perceived Brand Innovativeness (CPBI) construct was conceptualised and operationalised through six studies, using six different samples of university students. Initially, three exploratory qualitative studies (Studies A1–A3) were conducted to generate an enriched understanding of what brand innovativeness means to consumers. Next, three quantitative scaling studies were conducted to develop and validate CPBI measurement (Studies B1–B3). In the second phase, based on the findings from exploratory and scaling studies, a theoretically well-grounded CPBI model was developed, examining CPBI in its nomological network of relationships. Qualitative findings from Study A2, the concept specialisation model (Cohen & Murphy, 1984; Hampton, 1987; Murphy, 1988), information integration theory (Anderson, 1971, 1981a) and the associative network memory model (Anderson, 1984; Anderson & Bower, 1973) were considered collectively to guide the development of hypotheses. In a laboratory study, an experimental design was adopted to test the model for hypothetical product innovations, using a consumer panel of Australian adults. Finally in phase 3, the generalisability and validity of the proposed CPBI scale and model was examined for real product innovations and American consumers in a field study.

In sum, findings provide support for the proposed CPBI scale and model, repeatedly validated through the three phases of the program. Results indicated that in an exposure to a product innovation, consumers' current perception of brand innovativeness (pre-CPBI) and consumers'

perception of the technological newness of the innovation (TN) shape consumers' perception of product innovativeness (CPPI). The resulting CPPI along with pre-CPBI lead to formation of post-CPBI. Finally, post-CPBI has both attitudinal and behavioural outcomes. This research contributes to existing branding and innovation literature by proposing and empirically validating a new construct. Theoretically, the thesis examines how consumers perceive, process and respond to CPBI by combining information processing and inference making perspectives. Managerial implications of this research extend to product and brand managers faced with the challenge of effectively leveraging huge new product investments and publicly fostering an innovative perception for their brands and assessing return on such investments.

Declaration by author

This thesis is composed of my original work, and contains no material previously published or written by another person except where due reference has been made in the text. I have clearly stated the contribution by others to jointly authored works that I have included in my thesis.

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Shams, R., Alpert, F. & Brown, M. (2014, August). Customer perceived brand innovativeness: Concept, measurement, and validation. Poster session presented at the American Marketing Association Summer Marketing Educators' Conference (AMA), San Francisco, CA, USA.

Shams, R. & Pappu, R. (2012). Predictive validity of two firm innovativeness scales: Empirical evidence. In: R. Lee (Ed.). *Proceedings of ANZMAC 2012*. Adelaide, Australia: Australian and New Zealand Marketing Academy Conference.

Publications included in this thesis

Shams, R., Alpert, F. & Brown, M. (2014, August). Customer perceived brand innovativeness: Concept, measurement, and validation. Poster session presented at the American Marketing Association Summer Marketing Educators' Conference (AMA), San Francisco, CA, USA. Included as sections of Chapter 2.

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Shams, R. & Pappu, R. (2012). Predictive validity of two firm innovativeness scales: Empirical evidence. In: R. Lee (Ed.). *Proceedings of ANZMAC 2012*. Adelaide, Australia: Australian and New Zealand Marketing Academy Conference. Included as a footnote in Chapter 2.

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Contributions by others to the thesis

Professional editor, Dr. Adele Fletcher, provided copyediting and proofreading services according to the guidelines laid out in the university-endorsed national "Guidelines for editing research theses" (less than 5% contribution).

Statement of parts of the thesis submitted to qualify for the award of another degree

None

Acknowledgements

First and foremost, thank you to God—the compassionate and the merciful—who was next to me for every single step until this research came to fruition. On the completion of my thesis, there are also plethora of people I am indebted to for their counsel and support.

I would like to thank my principal advisor, Associate Professor Frank Alpert, for his thoughtful and invaluable comments and for pushing me to aim high. If I am an independent researcher now, it is mainly because of his advisory style. He not only provided valuable and clear advice, but also gave me the space to figure things out for myself and my thesis. I owe my thanks to my other advisor, Dr. Mark Brown, for joining my advisory team just in time when things inevitably went pear shaped. Thank you for believing in me. Thank you for being always available through this entire life-changing experience. I would also like to thank Dr. Ravi Pappu who first introduced me to this research area (brand innovativeness) four years ago, who encouraged me to pursue the brand innovativeness scaling project, which resulted in a desired and valuable academic outcome in my last year of candidacy. Thank you for supervising the thesis for the first two years of my candidacy.

I extend my greatest appreciation to the University of Queensland for granting me two scholarships; the University of Queensland International Research Tuition Award (UQIRTA) and the University of Queensland Research Scholarship (UQRS) and to the UQ Business School for awarding me the Top-Up Scholarship as well as financial support for conference attendance and data collection. I must also thank my fellow University of Queensland Business School (UQBS) Research Higher Degree (RHD) students: Rebecca, Micheal, Sabrina, Ann, Teegan and Hamed for your friendship and support. Thanks also to my dearest Sarah, my bestie since we first met in 2008, back home. Ali and Haura, thank you too for all of your kindness and support!

On a personal level, the unconditional love of my fabulous family made this thesis possible and at times was all that kept me going. To my beloved parents, thank you for your endless support and love. You taught me how to work hard and survive, how to be proud of myself and enjoy my PhD journey. Without your prayers and positivity none of this would have happened. How lucky I am to have you, even 14 000 km far from me. I can never praise you enough! To my fantastic and cheerful brothers; Saleh and Issac, having you guys around has reminded me of how life is meaningful, thank you! To my darling husband and fellow traveller in this journey, Hamed, since we got married in December 2012, THANK YOU! How blessed I am to have you next to me! How kind and understanding partner you are! The shoulders for all the tears! The wind beneath my wings! The light in the dark lonely moments! Thank you, dear, for being patient with all of the craziness of this Permanent Headache Degree around me: PhD! ☺

Keywords

Branding, innovation, brand innovativeness, consumer perceived brand innovativeness, consumer perceived product innovativeness, scale development, SEM, MGA

Australian and New Zealand Standard Research Classifications (ANZSRC)

ANZSRC code: 150503 Marketing Management (incl. Strategy and Customer Relations), 60%

ANZSRC code: 150504 Marketing Measurement, 40%

Fields of Research (FoR) Classification

FoR code: 1505, Marketing, 100%

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List of Abbreviations, Acronyms and Symbols

α – Cronbach's Alpha

ANOVA – Analysis of Variance

AVE – Average Variance Extracted

β – Standardised Regression Coefficient

CPBI – Consumer Perceived Brand Innovativeness

CPFI – Consumer Perceived Firm Innovativeness

CPPI – Consumer Perceived Product Innovativeness

CFA – Confirmatory Factor Analysis

CFI – Comparative Fit Index

CR – Composite Reliabilities

df – Degree of Freedom

EFA – Exploratory Factor Analysis

F – F -statistic

IIT – Information Integration Theory

IMC – Instructional Manipulation Check

λ – Factor loadings

λ^2 – Squared multiple correlations

M – Mean

MGA – Multiple Group Analysis

MGCFAs – Multiple Group Confirmatory Factor Analysis

n – Sample size

ns – Not significant

p – Probability value

PC – Product Category

R^2 – Coefficient of Determination

RMSEA – Root Mean Square Error of Approximation

SE – Standard Error

SEM – Structural Equation Modelling

SRMS – Standardised Root Mean Square

t – t -statistic

TLI – Tucker-Lewis Index

TN – Technological Newness

χ^2 – Chi-square statistic

1.1 Research Rationale and Research Questions

Firms invest significant resources in marketing programs to enhance innovativeness because innovativeness leads to growth and profitability (Aaker, 2007) and enhances firm performance (Hult, Hurley, & Knight, 2004). Moreover, successful innovations (e.g., Apple iPod, iPhone, iPad) can help a firm create an image of market leadership and establish entry barriers for competitors (Srinivasan, Lilien, & Ragaswamy, 2002). Researchers have also argued that *consumer* perceived innovativeness might develop sustainable competitive advantage for firms (Danneels & Kleinschmidt, 2001). However, many companies' new offerings fail within the first three years of innovation introduction (Wilke & Sorvillo, 2005) at an average cost of around US\$15 million for each such offering (Steenkamp, Hofstede, & Wedel, 1999). Considering these high estimates, clever firms must seek viable opportunities to maximise potential success in terms of a higher level of innovation adoption.

The present research proposes that in many cases a firm's success depends on how consumers perceive its brand(s) as offering innovations rather than the mere product attributes of the innovation. For example, both HTC and Samsung use the same cutting-edge technology of Android operating software in their smart phones and they have barely differed in terms of objective product innovation (e.g., features and functions) (Williams, 2012). Yet, Samsung smart phones are thought to be more innovative than those of HTC's (Einhorn & Arndt, 2010). It seems that there is another potential level of perceived innovativeness that consumers associate with brand names rather than product innovations.

Although the strategic impact of branding theory is duly recognised in the marketing literature (cf., Aaker, 1991; Keller, 1993), it is rarely treated extensively in the innovativeness literature. Established conceptualisations of perceived innovativeness from the consumer perspective, such as product innovativeness (Calantone, Chan, & Cui, 2006) and firm innovativeness (Kunz, Schmitt, & Meyer, 2011) are limited in their ability to explain how consumers perceive innovativeness at the brand level. Moreover, the majority of the conceptualisation and operationalisation of perceived innovativeness relies on the managerial perspective (e.g., Lee & O'Connor, 2003; McNally, Cavusgil, & Calantone, 2010; Sethi, Smith, & Park, 2001). Such lack of consideration of the consumer perspective is at odds with the current marketing practice that emphasises the role of the consumer's perceptions in the success of innovations (e.g., Hanna, 2012).

Therefore, the central argument of the present thesis is that in order to have a more complete picture of consumers' innovativeness perceptions, it is essential to incorporate a branding perspective (Aaker, 1991; Keller, 1993) to the study of innovativeness. To be successful in positioning as an innovative brand, managers need to first understand how consumers perceive innovativeness at the brand level—what I will formally call here *Consumer Perceived Brand Innovativeness* (CPBI), and second, how to measure CPBI. While recent research has begun to consider consumer perceived innovativeness at the brand level (Eisingerich & Rubera, 2010), the research confounds the notion of product innovativeness with brand innovativeness. Although it is acknowledged that there is some causative correlation between the concepts of brand and product (Gardner & Levy, 1955), the study does not recognise that the concept of brand is different and broader than the concept of product. As a result the only currently available brand innovativeness scale from the consumer's perspective does not provide a comprehensive operationalisation of what brand innovativeness means for consumers (see Chapter 2 for a detailed literature review on conceptualisation and operationalisation of CPBI).

Furthermore, while from a brand's perspective one of the main goals of new product developments is to signal brand innovativeness image to its consumers (Aaker, 2007), the current research does not explain how product innovations can enhance consumers' perceived innovativeness for a brand. In addition, although the current emerging literature provides a few evidences for the consequences of consumer perceived brand innovativeness (e.g., stock return, brand commitment, attitude toward service extension), the findings are limited by confounding either brand innovativeness and product innovativeness (Boisvert & Ashill, 2011; Eisingerich & Rubera, 2010) or brand innovativeness and firm innovativeness (Mizik & Jacobson, 2008).

Hence, the present thesis specifically examines four key research questions. The thesis starts with the basic question: **(1) how do consumers perceive innovativeness at the brand level?** It then moves on to operationalising CPBI by answering the question; **(2) how do we measure consumer perceived brand innovativeness?** In the next step, a CPBI processing model is developed and tested by answering two further questions; **(3) do firms' efforts to launch product innovations lead to CPBI and if so, how does exposure to the innovation affect consumer evaluations of the brand's innovativeness?** And **(4) what are the consequences of CPBI?** To answer these research questions, an integrated research program is conducted over eight progressive studies. The thesis research program is detailed below. The terms *consumer perceived brand innovativeness*, *CPBI*, and *brand innovativeness* have been used interchangeably in the present thesis. The key constructs employed in this thesis and their definitions are presented in Appendix F.

1.2 Thesis Overview and Program of Research

This thesis advances over six chapters. The first, this chapter, lays the foundation of the thesis, and poses research questions addressed by the thesis. The remainder of this thesis is structured as follows (see Figure 1.1 below):

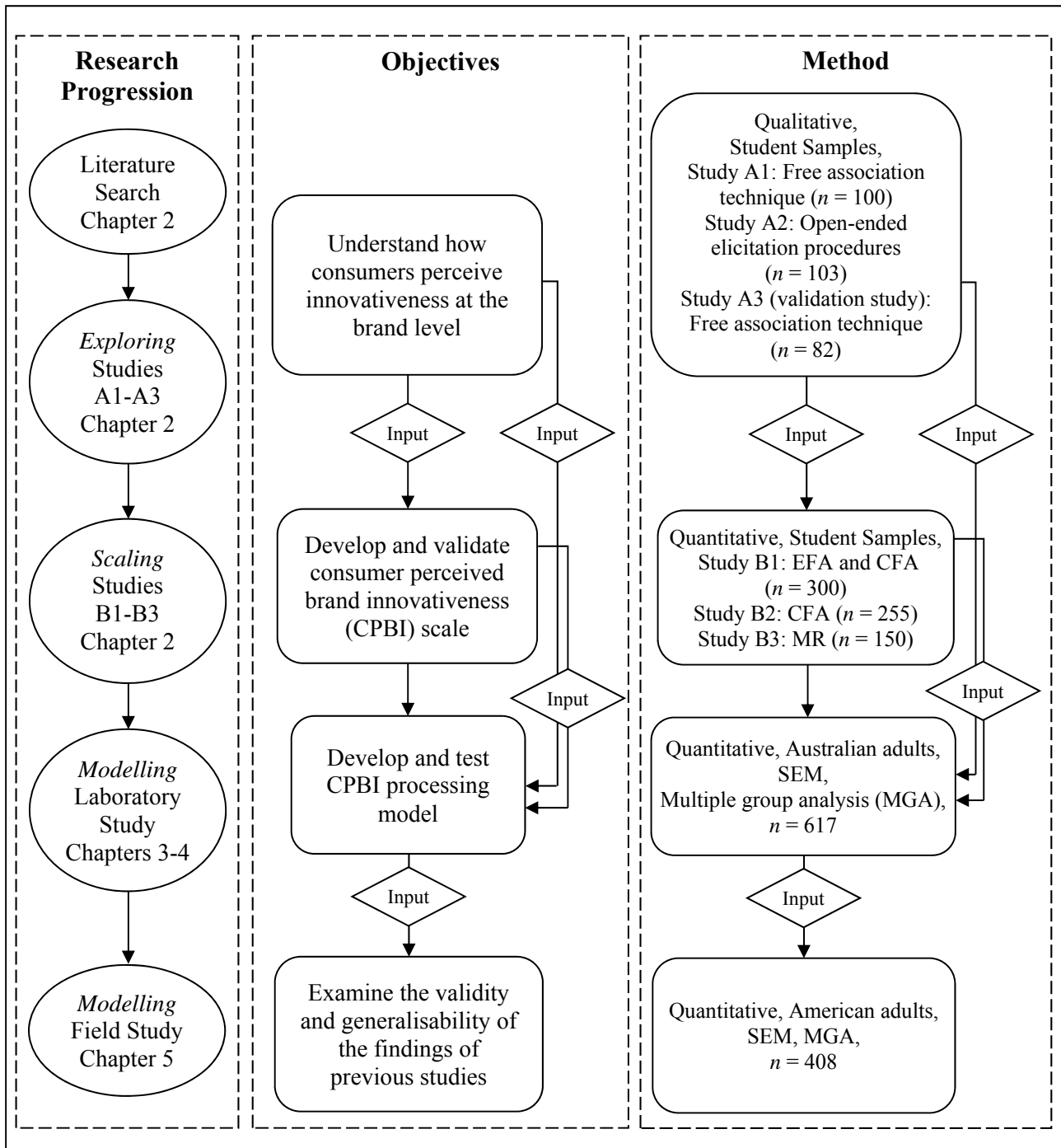


Figure 1.1 The overall thesis program

Chapter 2 answers research questions 1 and 2 and is divided into two parts: conceptualisation of CPBI and operationalisation of CPBI. In the first part, a comprehensive review in the areas of perceived product, firm and brand innovativeness from the consumer's perspective is provided. This part ends by conceptualising CPBI based on the associative network model of memory (Anderson, 1983) and signalling theory (Spence, 1974). In the second part, two series of studies are reported. Specifically, Studies A1 to A3 qualitatively explore how consumers perceive brand innovativeness. The findings answer research question 1. Next, based on these findings, in Studies B1 to B3, the CPBI scale is developed and validated. The findings answer research question 2; how do we measure consumer perceived brand innovativeness?

In the next step and toward a CPBI model, the CPBI processing model of the present thesis is argued and developed in Chapter 3. The framework builds on the concept specialisation model (Cohen & Murphy, 1984; Hampton, 1987; Murphy, 1988), information integration theory (Anderson, 1971, 1981a) and the associative network memory model (Anderson, 1984; Anderson & Bower, 1973), and explores the formation of CPBI and its consequences. The process of initial model validation using the results of Study A2 is also presented.

Chapter 4 is dedicated to reporting the method, analysis and results of testing the CPBI model developed in Chapter 3. The discussion starts with the method and the overall research design adopted to address research questions 3 and 4. This is followed with data analysis and reporting of results for the measurement and structural model using a multiple group confirmatory factor analysis approach. The model is tested in a laboratory setting among 617 Australian adults. The chapter ends with a detailed discussion about the overall results of testing the CPBI processing model as well as the results of the analysis of the equivalency of the structural paths across experimental groups

In Chapter 5, the majority of the CPBI processing model is replicated in a field study among 408 American adults to (1) enhance the generalisability of the findings of previous chapters, (2) examine the application of results to real world situations and (3) test construct validity of the CPBI across different populations. Specifically this field study examines the CPBI processing model for the Apple and Nokia brands in the tablet product category, and their recent introductions of iPad Air and Lumia 2520 respectively. Data collection for the laboratory and field studies was completed in five months from December 2013 to April 2014.

Finally, Chapter 6 concludes the thesis by summarising the findings of these eight studies in relation to the research questions. The chapter provides an in-depth discussion of the thesis' theoretical contributions and managerial implications. Lastly, limitations and directions for future research are covered. Copies of the survey instruments used for the thesis studies are presented in the appendices.

1.3 Thesis Originality

The main contribution of this thesis is to develop the first theoretical framework on which to base branding and innovation interactions (Di Benedetto, 2012) by applying branding principles to innovation theory (Rogers, 2003), while simultaneously contributing to the branding theories (Aaker, 1991; Keller, 1993) by applying the concept of innovativeness from the consumer perspective. Specifically, the present thesis is the first to identify the limitations of product and firm innovativeness conceptualisations with regard to brand innovativeness. It develops a unique and theoretically supported conceptualisation and operationalisation of consumer perceived brand innovativeness. It provides the first qualitative elicitation of how consumers understand brand innovativeness utilising two complementary methods (free association and open-ended elicitation procedures). The thesis presents the first brand concept map for the concept of innovative brands. It introduces, develops and repeatedly validates the consumer perceived brand innovativeness (CPBI) scale. It advances a theoretically-grounded model to argue for the CPBI system of relationships. The thesis presents the first examination of the relationship between consumer perceived product innovativeness (CPPI) and CPBI. It is among the very first studies to empirically test the outcomes of CPBI. These efforts are accomplished through eight successive studies using eight independent samples ($n_{\text{total}} = 2015$). See Chapter 6 for a detailed discussion on the contribution to theory and practice.

1.4 Research Philosophical Approach

This thesis adopts the post-positivist approach that has traditionally dominated consumer and marketing research. This approach guides the program of this thesis in investigating the research questions. Post-positivists differ from other philosophical traditions on ontology (the nature of reality), epistemology (the relationship between the inquirer and the object of investigation) and methodology (gaining knowledge of the world) (Denzin & Lincoln, 2012).

The realist ontology states that reality can never be perfectly comprehended; and, as Guba (1990) discusses, researchers are only able to continually move towards understanding reality. Thus, the fundamental assumption that underpins this thesis is that the researcher does not attempt to fully apprehend reality; she can only approximate what the real world is (Gabbott & Jevons, 2009). With this assumption in mind, this thesis aims to examine and explore the experiences, processes and effects of perceived brand innovativeness through the perspectives of consumers.

Post-positivists also pursue objectivistic epistemology (Lincoln & Guba, 2011). This refers to the beliefs that (1) there is an objective and given reality beyond human consciousness which is seen as the ultimate foundation for all human knowledge (Sandberg, 2001), and that (2) both the

subject and object of study are independent of each other (Lincoln & Guba, 2011). Adopting this paradigm in this thesis, eight studies are systematically conducted to gather data that will be used to carefully monitor the extent to which the proposed CPBI conceptual model corresponds to the particular aspect of objective reality that is investigated. Accordingly, through this systematic approach and using a multi-method research design, it is assumed that the research will approach a true picture of reality (Jick, 1979).

Finally, in terms of methodology (i.e., how do we gain knowledge of the world? Guba, 1990; Lincoln, 1989) a combination of qualitative and quantitative research methods have been used by researchers within the post-positivist tradition in order to capture reality as far as possible. Emphasis has been placed on discovery and verification of theories (Denzin & Lincoln, 2012), and falsifying hypotheses by explaining, predicting, controlling and making generalisations about the phenomena under study across respondents (Leedy & Ormrod, 2005; Van Dyne & Pierce, 2004). Therefore, this thesis employs qualitative methods to examine the complex nature of perceived brand innovativeness in order to describe and understand the phenomenon from the consumer's perspective. In addition, quantitative methods are employed to examine the relationships proposed among consumer perceived brand innovativeness, its drivers and consequences. The use of multiple research methods will result in overcoming common methods bias (Podsakoff, MacKenzie, & Podsakoff, 2012) by counter-balancing the weaknesses of any single method in studying CPBI (Jick, 1979).

Overall, the post-positivist approach provides a fit between the research questions and the multiple-method research design used in this thesis. The consistency of the ontology, epistemology and methodology adopted for this thesis assures the legitimacy of the knowledge created.

1.5 Ethical Considerations

This thesis adheres to the guidelines of the ethical review process of The University of Queensland, from data collection and storage, to reporting the results. All eight studies were approved by one of the human ethics committees of The University of Queensland in accordance with the guidelines of the National Health and Medical Research Council, before the commencement of studies. Participants were recruited on a voluntary basis in all the studies and there was no added risk to the participants over and above the risks of everyday living. Efforts were also made to minimise any unforeseeable harm in the design of the studies, the wording of the questionnaire, and the delivery of the procedure.

The Information Sheet and Consent Form provided participants with sufficient information on (1) the title of the project; (2) the purpose of the proposed study; (3) the expected duration of their participation in the study; (4) a clear and precise description of procedures for their

involvement; (5) a clear description of any foreseeable risks due to their involvement in the study; (6) the method used to maintain their confidentiality and privacy, along with the security of the data once collected and stored; (7) a statement that their participation was voluntary and that they might withdraw at any time without prejudice; (8) a statement that advised what would happen to data already collected should they withdraw after commencing the project; and (9) the name and contact details of the researcher and her supervisors to answer any further questions they might have concerning their participation in the project. Finally, the University's ethical code was included in these forms which provided participants with an avenue of complaint should they feel they were not able to discuss their concerns with the researchers themselves.

There was no collection of personal information in any of the eight studies. Only overall patterns of results are reported and individual respondents are not identifiable. Some demographic data were collected, for example, the age and gender of participants. However, this information was required simply to understand the broad characteristics of the sample and how sample characteristics might influence the overall pattern of results (and their interpretation). This information was not used (and could not be used) to identify individual respondents. Finally, to ensure data security, data are stored in three separate copies on the researcher's personal computer, on the researcher's computer at the University and on the researcher's external drive as backup. All three require a password to be accessed. No further copies of the data were made or distributed. Overall, participation in the study involved no foreseeable physical and psychological risks as the studies only involved paper-and-pencil and online tests.

1.6 Conclusion

This chapter provided the foundation for this thesis. The chapter argued the rationale and motivation for the study of consumer perceived brand innovativeness (CPBI) followed by the research questions. Subsequently, the thesis overall structure was presented, as were the original contributions of the thesis to the field. Then the thesis philosophical underpinnings were discussed. Finally, ethical considerations adopted by the researcher were explained. Based on this foundation, a detailed review of the consumer perceived innovativeness literature and the conceptual development of the CPBI construct follows in the next chapter.

Chapter 2 Consumer Perceived Brand Innovativeness: Conceptualisation and Operationalisation— Exploratory and Scaling Studies

2.1 Introduction

Chapter 1 introduced an overview of the research problem including a discussion of the need for research and provided the thesis structure. The main purpose of Chapter 2 is to theorise the CPBI conceptualisation and to develop the CPBI measurement by answering two research questions. (1) How do consumers perceive innovativeness at the brand level? And (2) how do we measure consumer perceived brand innovativeness? In doing so, the following sections first provide a review of the key findings in the literature on consumer perceived innovativeness. The discussion paves the way to better understand brand innovativeness from a consumer's perspective, and to further delineate the shortcomings of the current conceptualisations and operationalisations of perceived innovativeness at the product, firm and brand levels. Next, the theoretical foundation of the CPBI conceptualisation is described, followed by the research methodology including exploratory and scaling studies. Finally, the major contribution and limitations of these studies are briefly discussed. By covering some of the main limitations of these studies, Chapter 3 is linked to this chapter.

2.2 Background Literature

A brand can be defined as “a name, term, sign, symbol, or design, or combination of them which is intended to identify the goods and services of one seller or group of sellers and to differentiate them from those of competitors” (Keller, 2013, p. 2). The strategic impact and role of brands are extensively recognised elsewhere in the marketing literature (see Aaker, 1991; De Chernatony, McDonald & Wallace, 2011; Kapferer, 2012; Keller, 2013). As a source of sustainable competitive advantage, a brand is the most important intangible asset of a firm (Keller, 2013) which can develop sustainable competitive advantage for companies (Aaker, 1989). A brand not only serves as an encoding cue for brand-related information such as understanding of a new product's characteristics (Keller, 1993), but also serves as a powerful heuristic cue for evaluations and choice decisions (Park & Lessing, 1981). Firms collectively spend billions of dollars per year to promote the perception that their brands are innovative (Aaker, 2007) and actively pursue higher levels of consumer perceived brand innovativeness. Yet, much of the innovation literature devoted to the tangible impact that new product development programs may have on outcomes of product innovation (Henard & Dacin, 2010), leaving less tangible facets of innovation, such as brand

innovativeness relatively unexplored.

There is relative agreement among marketing and innovation researchers that innovation is an outcome of firm activity (e.g., goods and services) (Crawford & Di Benedetto, 2011; Kunz et al., 2011). An innovation is “a new idea, practice, or object which is perceived as new by the individuals or other units of adoption” (Rogers, 2003, p. 12). It may be “a recombination of old ideas, a schema that challenges the present order, a formula, or a unique approach” (Van de Ven, 1986, p. 591). Depending on the basic need (utilitarian or affective) which is meant to be served, innovations could be categorised as symbolic (e.g., fashion products such as Gucci sunglasses) or technological ones (e.g., iPod) (Hirschman, 1982). While technological innovations are centred in a product’s tangible features, a symbolic innovation communicates a new social meaning (Dell’Era & Verganti, 2011).

However, the current literature on innovation diffusion does not provide a consensus on the exact meaning of innovativeness. There are two levels of conceptualisation of innovativeness based on whether the subject of perception is the outcome of the firm (goods and services) or the firm itself. While the former is referred to as product innovativeness, the latter is labelled as organisational or firm innovativeness. Both levels of conceptualisation have been examined from the perspective of managers (e.g., Hult et al., 2004) and consumers (e.g., Kunz et al., 2011). Consumer perceived innovativeness is a very important brand association that positively affects consumer evaluations of products (Brown & Dacin, 1997) and firms (Aaker, 2007). Therefore, the present thesis takes a consumer-centric approach to the conceptualisation of perceived innovativeness at the brand level.

2.2.1 Consumer Perceived *Product* Innovativeness (CPPI)

From the consumer’s perspective, product innovativeness has been defined along two broad dimensions: (1) the classical notion of newness (novelty) defined in terms of the relative difference between new and previous offerings (Garcia & Calantone, 2002) and (2) meaningfulness (value, usefulness, utility or advantage), which is the degree to which any new offering is also perceived as appropriate and useful by consumers (Rubera, Ordanini, & Griffith, 2011).

The theory of diffusion of innovations (Rogers, 1962) has been widely used to conceptualise product innovativeness from a consumer perspective (e.g., McNally et al., 2010). Technology-driven innovation is the fundamental characteristic of this theory to the extent that the words innovation and technology are synonymous (Rogers, 1962, p. 12; Rogers, 2003, p.13). Although Rogers’ definition of technology is broader than merely product characteristics, the conceptualisation and operationalisation of consumer perceived innovativeness at the product level in prior studies has typically focused on technological innovation in terms of product features and

functionality (cf., Danneels & Kleinschmidt, 2001; Gima, 1995; Hoffmann & Broekhuizen, 2010; Lee & O'Connor, 2003; McNally et al., 2010).

However, innovations may be adopted for either their cutting-edge technological features, their symbolic meanings that they convey to consumers or both (Dell'Era & Verganti, 2011). For instance, in the smart tablets market (e.g., Samsung's Galaxy Tab, ASUS's Transformer, HTC's Flyer, Blackberry's PlayBook and Apple's iPad), the battle is mainly between Apple and Android. Surprisingly, it seems that the winner is Android, when it comes to product innovativeness and technological innovations from the perspective of technology experts (Raphael, 2010). From the more everyday consumer's perspective, however, the iPad is still rated among the top innovations around the world (McCracken, 2010) and Apple remains synonymous with innovativeness. It seems that the Apple brand has a special advantage regarding perceived innovativeness that could overcome the objective technology battle. Apple develops its own language to appear innovative. It successfully utilises both technology and non-technology drivers to create the image of innovativeness for its brand. Hence, the broader conceptualisation of innovativeness at the brand level allows for a more complete picture of innovation adoption by emphasising not only the product features and technology but also the special meaning that a brand signals to the market in order to create the image of innovativeness. Brands can use innovation language (e.g., colour, feel and look, logo, design and brand name properties) to signal a specific meaning such as innovativeness (e.g., Verganti, 2008).

Another relevant point in support for differentiating between perceptions of product and brand innovativeness is that brands can have different perceptions in different product categories. Innovativeness has been claimed to be a product category level perception (Pappu & Quester, 2013). A corporate brand like Samsung can have different levels of consumer perceived brand innovativeness in TV, mobile phone, refrigerator, camera and PC product categories. For example, Samsung mobile phones may be perceived highly innovative while Samsung PCs may be rated lower.

The above limitations of perceived innovativeness conceptualisations at the product level lead to another major limitation with the current research regarding the operationalisation of consumer perceived product innovativeness. While acknowledging the necessity of the consumer's perspective, most previous studies (e.g., Calantone et al., 2006; Garcia & Calantone, 2002; Gima, 1995; Lee & O'Connor, 2003) assume that the consumer's perception of innovativeness is a single or multiple product judgment. Indeed, the majority of studies measure product innovativeness for the most recent new products launched in the market. For example, the results of a recent meta-review (Arts, Frambach, & Bijmolt, 2011) of 77 studies in the innovation adoption literature between 1970 and mid-2007 show that over 60% of the studies have focused on analysing a single

innovation and only 10% of the studies examined more than five different innovations. However, consumers' perceptions of new offerings are not simply a snap shot of the new launched product without any brand context because innovations are launched under their parent brand's name. Consumers (consciously or unconsciously) also use their brand knowledge in making judgments about innovativeness. For example, in terms of product features, the iPhone 6 represents only a minor increment from the iPhone 5s in terms of technological advancement; however, thanks to the name "Apple", all new Apple branded products are widely perceived to be innovative.

Finally, the majority of studies that examine consumer perceived product innovativeness, investigate consumer perceptions through managers' self-reported scales (e.g., Calantone et al., 2006; Gima, 1995; Lee & O'Connor, 2003; MacNally et al., 2010), although a few others take a slightly improved approach and validate managers' responses using a convenience sample of consumers (e.g., Sethi et al., 2001). This is inconsistent with the large body of literature emphasising the importance of consumers' perceptions and the perceptual mismatch between managers and consumers (Danneels & Kleinschmidt, 2001). In fact, "it is the characteristic of a new product not as seen by experts but as perceived by the potential adopter that really matters" (Rogers, 1962, p. 123).

2.2.2 Consumer Perceived *Firm* Innovativeness (CPFI)

From a consumer's perspective, firm innovativeness has been conceptualised from a long-term perspective and defined as "a consumer's perception of an enduring firm capability that results in novel, creative, and impactful ideas and solutions for the market" (Kunz et al., 2011, p. 817). Firm innovativeness, from the consumer's perspective, is viewed as the product of years of successful innovative tracks in the consumer's mind, which takes time to create (Henard & Dacin, 2010). This image creating approach is also suggested by other studies (e.g., Cowart, Fox, & Wilson, 2008), emphasising the usefulness of innovativeness image creation as a strategic tool that companies can apply to facilitate the diffusion of innovations. The few available conceptualisations of firm innovativeness from a consumer's perspective (e.g., Henard & Dacin, 2010; Kunz et al., 2011) are closer to the branding perspective on perceived innovativeness employed in this thesis. However, the main assumption that consumers' judgment of innovativeness is about firms, is one key difference underlying these studies.

While consumers may be familiar with firm (company) brands such as Apple or Sony, most consumers would have trouble identifying the products such as Duracell, Tylenol and Dettol with companies that actually own them (i.e., Procter and Gamble, Johnson and Johnson, Reckitt Benckiser). Moreover, company brands may not be perceived at the same level of innovativeness for all of their product categories. For example, BMW is perceived as more innovative than Suzuki

in the car category. However, in different product categories in which two brands compete, this may be different (e.g., BMW vs. Suzuki motorcycles). Hence, brand innovativeness can provide more precise information within and between product categories. Furthermore, it would be helpful for company brands such as Samsung to capture the innovativeness level of each of its mobile phone brands (e.g., Galaxy, Nexus or Omnia) that may contribute to brand innovativeness of the brand Samsung in the mobile phone product category.

2.2.3 Consumer Perceived *Brand* Innovativeness (CPBI)

The term *brand innovativeness* has recently been introduced in the perceived innovativeness literatures. One of the first attempts to conceptualise the construct is offered by Quellet (2006) as “consumers’ perceptions about a brand’s tendency to engage in and support new ideas, novelty, experimentation, and creative processes” (p. 312). However, it is not clear what the difference is between new ideas and novelty. Furthermore, the author does not clarify what is meant by experimentation in the definition.

More recently and based on exchange theory (Bagozzi, 1975), Eisingerich and Rubera (2010) argue that consumers reciprocate with brands that view them as being focused on their needs. They conceptualise brand innovativeness as “the extent to which consumers perceive brands as being able to provide new and useful solutions to their needs” (p. 66). However, there are two main limitations in their proposed conceptualisation of brand innovativeness. Firstly, they take a *product* level perspective to the notion of brand by narrowing the definition to product newness and usefulness. Secondly, under this definition, the innovativeness perception is dependent on a brand’s capability to satisfy “their [consumers’] needs”. This limitation is mainly due to the theoretical foundation of the definition. Consumers may still have innovativeness-related associations for a focal brand, although they do not need its offerings. For example, people may not need a Segway personal transporter or a Google driverless car system, but they would still recognise these as innovations. The study made a significant contribution by developing the first brand innovativeness scale from consumers’ perspective, but I believe there are conceptual and empirical limitations¹.

¹ A preliminary study I conducted to examine the dimensionality, reliability and scale sensitivity of Eisingerich and Rubera’s brand innovativeness scale identified two problems with their measure. A total of 163 university students (53% female) rated one of four brands on their scale (26% Samsung, 25% Nokia, 27% Nike and 21% Hush Puppies). A pretest was conducted to select brand names and product categories. The data were subjected to exploratory factor analysis. Negatively worded items loaded on one dimension and positive worded items loaded on the second dimension, which can be attributed to the wording redundancy that is known to threaten the dimensionality of a measure (Floyd & Widaman, 1995). In addition, the results of ANOVA analysis indicated that the scale performance appears to be product category specific. While the scale worked for shoes, it was not sensitive enough to distinguish between highly and less innovative brand names in the mobile phone category. Specifically, in the mobile-phone category ($n = 84$), the difference between Samsung (as the highly innovative brand) and Nokia (as the less innovative brand) was not significant ($F_{1, 82} = 3.443, p > 0.05$). However, the difference between Nike (as the highly innovative brand) and Hush Puppies (as the less innovative brand) was significant ($F_{1, 77} = 7.379, p < 0.05$).

Finally and drawing on signalling theory (Spence, 1974), Henard and Dacin (2010) explore the notion of perceived innovativeness at the firm level by conceptualising *corporate reputation for product innovation* (RPI) as a “constituent-specific perception of a firm’s track record of product innovations, degree of creativity, and potential for continued innovative activity in the future” (p. 321). The current study adapts the above definition for consumer perceived brand innovativeness and defines the construct as “*consumers’* perception of a *brand’s* track record of product innovations, degree of creativity, and potential for continued innovative activity in the future *in a given market*”. An innovative brand needs to be concerned with its target market. A brand could be perceived as an innovative one by a group of consumers and simultaneously may not be associated with innovativeness by another target market. Therefore, it is necessary to narrow the definition to target markets.

Consumer perceived brand innovativeness is a subjective assessment based on the consumer’s perception. CPBI could result from technological and/or symbolic innovations. It could result from really new offerings (e.g., breakthroughs and cutting-edge offerings), extensions, new product features, and new marketing communications (Kunz et al., 2011). To build up consumers’ perceptions of innovativeness, the characteristics and behaviours of brands should be stable over time (Brown & Dacin, 1997) and consistent with such an image. The innovative efforts and offerings of a brand should be in a “timely way” (Mizik & Jaconson, 2008, p. 17), on a “continuous basis” (Eisingerich & Rubera, 2010, p. 66) and with a “historical consistency of action” (Henard & Dacin, 2010, p. 322). Consumer perceived brand innovativeness is usually the outcome of years of demonstrated competence. To further elaborate the adapted definition for brand innovativeness, the theoretical foundations of the above conceptualisation are discussed in the following section.

2.3 Theoretical Foundation

In order to incorporate a branding perspective to the notion of innovativeness, the present thesis builds partly on signalling theory (Spence, 1974) from information economics and mainly on the associative network model of memory (Anderson, 1983) from cognitive psychology.

2.3.1 Signalling Theory

CPBI can act as a signal to consumers. According to signalling theory (Spence, 1974), firms possess tangible as well as other intangible attributes (e.g., brand innovativeness) that are subject to manipulation. A further premise is the assumption that most product markets are associated with the imperfect and asymmetric information state that leads to consumer uncertainty about brands and their attributes (Stiglitz, 1987). Consumer uncertainty leads to consumer

perceived risk because consumers cannot readily evaluate the product quality (Robertson, Zielinski, & Ward, 1984). Hence, consumers get involved in information gathering about brands to reduce uncertainty and perceived risk. In these markets, brands can serve as signals of product positions and convey information about product attributes, consequently reducing the consumer perceived risk (Erdem & Swait, 2004).

Information asymmetries are likely to also exist among consumers of innovative brands in a new product marketplace. For example, consider a home lighting system that converts solar energy directly to electricity. Lack of perfect information among consumers about the innovation makes them rely on a firm's reputation and image when forming perceptions about its brands' innovations. Within the context of this research, CPBI is viewed as an intangible company asset that is subject to manipulation (via signalling) by the company. Given that the marketplace is inherently uncertain, a promotion of brand innovativeness serves as a signal to potentially influence consumers' behaviour (Henard & Dacin, 2010; Stock, 2011).

However, with regard to the present study, signalling theory has two underlying limitations that lead to an incomplete picture for conceptualising CPBI. First, signalling literature largely draws on information economics in which consumers are assumed to be rational decision-makers that make trade-off decisions to adopt the brand's offering (e.g., an innovation) by considering two factors; namely, expected utility and perceived risk (Erdem & Swait, 1998; Stiglitz, 1987). However, recent studies report that the innovation adoption process could be emotion generating (hedonic) and independent from the net of utilities (Wood & Moreau, 2006). In fact, innovativeness excites consumers (Haberland & Dacin, 1992) and is associated with surprise (Besemer & O'Quin, 1986).

Second, although signalling theory is useful to demonstrate the strategic role of CPBI as a firm's signal and its possible effects on consumers' behaviour, this theory is not capable of incorporating the meaning of brand innovativeness in the minds of consumers, which is the primary goal of the present research. Thus, although the adapted definition of the CPBI concept is originally based on signalling theory (refer to Henard & Dacin's [2010] conceptualisation of corporate reputation for product innovation), the full conceptualisation of CPBI encompasses both rational and emotional dimensions in the present thesis. To draw a more complete picture of CPBI, I also build on the associative network model of memory.

2.3.2 The Associative Network Model of Memory

The associative network model of memory (Anderson, 1983) has been used in marketing to explain the structure of memory (Krishnan, 1996) and to represent the organisation of a brand in human memory (John, Loken, Kim, & Monga, 2006). This model will be used to elucidate how

innovative brands are represented in memory and processed by consumers. The associative network model views semantic memory or knowledge as a cognitive system, consisting of a set of nodes and associative links. These nodes are pieces of information such as brand names that become connected via associative links with varying degrees of strength (Krishnan, 1996). Thus, a brand is a collection of associations (Keller, 1993). When information about an item is retrieved, the activation of the concept representing that item is increased, and activation spreads through the network, enhancing the activation of other nearby concepts (Ratcliff & McKoon, 1988). The amount of activation is purported to be a function of the strength of associative links, or distance between nodes (Krishnan, 1996).

Consistent with the associative network memory model, brand knowledge consists of a brand node in consumers' memory with a variety of associations that are linked to it. For example, the brand node "Samsung" can have an association with the node "innovativeness", such that each entity becomes part of the other's association set. The strength of the link between "Samsung" and "innovativeness" provides the opportunity for node activation. If the node "Samsung" is activated and "Samsung" is strongly associated with "innovativeness", then the node "innovativeness" in the context of Samsung is likely to be activated in the consumer's mind. This activation process may operate in the reverse direction.

Powerful brands (e.g., a highly innovative brand) have richer associative networks with stronger linkages between the brand node and other nodes. According to the associative network memory model, innovativeness would act as an additional node in memory which is associated with a brand node. These links in memory, such as the links between innovativeness and a brand, can vary in strength of association. Multiple associations for a brand make it easier to locate the brand node in consumers' mind (Aaker, 1991). Moreover, for a highly innovative brand, nodes such as innovativeness, novelty, forward-looking and up-to-date (Eisingerich & Rubera, 2010; Kunz et al., 2011) are more strongly linked to the brand name, and collectively help bring up the brand name when the consumer thinks about innovativeness.

For example, one of the most recent innovations in the automobile market is the introduction of hybrid automobiles. Interestingly, while Honda actually launched the first product innovation in this market, Toyota (under the brand name of Toyota Prius) was successful in creating the image of market leader for hybrid innovations. One explanation for this success could refer to Toyota's rich innovativeness-related association network over its history with strong linkages between Toyota (i.e., brand node) and newness, creativity, innovation and extended car line in the consumer's mind. Thus, consumers may consider Toyota cars more related to innovativeness than Honda cars.

Finally, brand associations can be classified into two major categories of performance (i.e., meeting consumers' functional needs) and imagery (i.e., meeting consumers psychological and social needs) with several additional sub-categories within these categories (Keller, 2013). Performance associations include primary ingredients and supplementary features, product reliability and durability, service effectiveness and efficiency, style and design, and price. Imagery associations are mainly classified as user profile, purchase and usage situations, personality and values, and history and experiences. Strong, favourable and unique associations help produce feelings for brands (Keller, 1993; 2013).

As argued earlier, a highly innovative brand is more likely to have richer associative networks with stronger linkages between the innovative brand and other nodes. Consider, for example, IKEA as a highly innovative brand in the furniture industry in terms of the design and style of its products (Verganti, 2008). The brand node of "IKEA" is strongly associated to the node "design". Furthermore, most innovative brands will likely have the "excitement" personality in the consumers' mind, and are strongly associated to nodes such as daring, spirited, imaginative and up-to-date (Aaker, 1997). These strong and favourable associations for an innovative brand may produce feelings of fun and excitement for consumers.

2.4 Exploratory and Scaling Studies Method

The previous sections explain the conceptualisation of CPBI from a theory perspective. I now focus on *consumers*, and investigate (a) how consumers understand brand innovativeness in their own terms and (b) how to operationalise CPBI. This investigation will detail and enrich our understanding of CPBI. Six studies were conducted in person and in two successive steps: exploratory and scaling investigations. Exploratory Studies A1, A2 and A3 address the first research question: how do consumers perceive innovativeness at the brand level? These qualitative studies were aimed at determining how consumers define brand innovativeness and the characteristics they associate with it. To ensure that (1) both explicit and implicit innovative brand knowledge (Koll, Wallpach, & Kreuzer, 2010) are retrieved, and (2) a more comprehensive concept map for CPBI is produced, two complementary methods including free association (Nelson, McEvoy, & Dennis, 2000) and open-ended elicitation techniques (Netemeyer, Burton, & Lichtenstein, 1995) were used in Exploratory Studies A1, A2 and A3. Copies of the questionnaires for these studies are presented in Appendix A.

Next, in the scaling investigation, based on the procedures proposed by Churchill (1979) and Netemeyer, Bearden and Sharma (2003), a CPBI measurement scale was developed in Studies B1, B2 and B3. Scaling Studies B1, B2 and B3 address the second research question; how do we measure consumer perceived brand innovativeness? Copies of the questionnaires for these studies

are presented in Appendix B. Following conventional exploratory factor analysis (EFA), confirmatory factor analysis (CFA) using AMOS 21 was performed on the proposed CPBI scale to determine the fit of the measurement model. Theoretical considerations as well as model fit indices guided the analysis of the data and the evaluation of the model fit.

While there are a variety of fit indices that can be used to evaluate a hypothesised model fit (Anderson & Gerbing, 1988), following Bagozzi and Yi (2012) and Hu and Bentler (1998), this thesis utilises Chi-square (χ^2 , $p > 0.05$), root mean square error of approximation (RMSEA), standardised root mean-square (SRMS), Tucker-Lewis index (TLI) and comparative fit index (CFI). These fit indices are the most commonly accepted in respected academic marketing journals. RMSEA values of about 0.08 or less would indicate a reasonable error of approximation and one would not want to employ a model with a RMSEA greater than 0.1 (Arbuckle, 2012). SRMS values of about 0.08 or less are considered acceptable (Bagozzi & Yi, 2012; Hu & Bentler, 1998). The generally accepted threshold for TLI and CFI is above 0.95 (Arbuckle, 2012; Bagozzi & Yi 2012; Hu & Bentler, 1998). In addition to the above, factor loadings (λ) above 0.50, squared multiple correlations $\lambda^2 \geq 0.50$ and absolute standardised residual covariance values less than 2.58 were deemed as acceptable (Jöreskog & Sörbom, 1993).

2.4.1 Participants

Six different convenience samples of students were recruited for Studies A1 to B3. The samples were collected at a large, cosmopolitan Australian university, but no major differences with regard to perceived innovativeness are expected between students here and in most other Western industrialised nations. It can be argued that student samples used in the study of innovativeness are meaningful and the results can be generalised to non-student samples for the following reasons.

First, consumers who adopt an innovation earlier than other members in a social system are called innovators (Rogers, 2003). Younger generations typically adopt innovations at a faster rate than older generations, hence they are considered to be more innovative than older generations (cf., Steenkamp et al., 1999; Vandecasteele & Geuens, 2010). A student sample can feasibly be assumed to include a large proportion of “innovators”, which are often the main target market for new offerings (Mahajan & Muller, 1998) because innovators also influence the behaviour of late adopters (Rogers, 2003). Furthermore, student samples have been used successfully for the study of consumer perceived innovativeness (e.g., Kunz et al., 2011). Moreover, the issue of generalisability of empirical findings across student and non-student samples is addressed in the previous research in the context of brand extensions (Völckner & Sattler, 2007). The results of their two large-scale empirical studies with more than 160 brand extensions by 70 brands indicated that findings derived from students largely generalise to non-student samples. Brand extensions signal an innovative

image of the brand to consumers (Aaker & Keller, 1990; Aaker, 2007). Finally, students have been found to exhibit similar cognitive processing mechanisms to the wider population (Anderson, 1981).

2.5 Exploratory Studies Analysis and Results

Three complementary qualitative studies were conducted to address research question (1) how do consumers perceive innovativeness at the brand level? Consistent with the results of literature review and the proposed conceptualisation for the CPBI construct theorised in the previous section, the findings of the following exploratory studies provide further evidence to consider CPBI as a related but distinct concept from product or firm innovativeness concepts. Built on these findings, scaling studies examine how to operationalise CPBI.

2.5.1 Study A1: Free Association Tasks Study

This study was aimed at eliciting innovativeness-related associations at the brand level. Free association is the most powerful method to profile brand associations (Keller, 1993), which focuses on retrieving easily accessible verbal associations from semantic memory (Krishnan, 1996). The method asks participants to produce the first words to come to mind that are related in a specified way to a presented stimulus (e.g., brand name) (Nelson et al., 2000). Brand innovativeness was the stimulus in this study. Participants ($n = 100$, 53% female, $M_{\text{age}} = 22\text{yrs}$) were asked to list up to at least two words that come to their mind when they think of an innovative brand. The questionnaires were distributed in an undergraduate class (see Appendix A.1 for the sample questionnaire).

Two PhD students (majoring in marketing) independently coded all innovative brand associations. Before conducting the coding task, coders were trained by providing verbal and written instructions. The requirements of the task were explained to the coders while the conceptualisation of the consumer perceived brand innovativeness was provided. Then the researcher applied the instruction for five examples outside Study A1 participants' responses. Next, in the presence of the researcher, two coders were asked to undertake a pre-coding task using the task explanation and CPBI conceptualisation for 10 participants' responses in Study A1. At this stage, discussion among the two coders and the researcher resolved any disagreement. Also, new coding categories were recorded for coding new words. The coders found the instruction clear and no confusion was observed with the task.

Following this training step, the judges coded Study A1 innovative brand related associations independently. Coding categories (i.e., innovativeness-related associations at the brand

level), coding examples and non-examples were provided to the coders following procedures prescribed in the literature (Neuendorf, 2002; Weber, 1990). Building on consumer perceived innovativeness literature, coding categories were developed. The coders were asked to use one specific code for each association (i.e., word) that consumers elicited and treated synonym words (e.g., novel and new) under one code. For instance, association examples of code 1 were “creative”, “be(ing) creative”, “creativity”, while “novelty” and “newness” were the non-examples for code 1 because, according to the literature, creativity included two dimensions of “novelty” and “usefulness” (Rubera et al., 2011). For any word that was not listed in the coding categories, the judges were asked to produce a new code. These innovativeness-related associations at the brand level (i.e., coding categories) are listed in Table 2.1. All disagreements were then resolved through discussion with the researcher.

2.5.1.1 Findings of Study A1

First, conventional measures of inter-coder reliability were used to analyse the data. The inter-coder percent agreement (probability of agreement) as well as the Cohen’s coefficient Kappa for all of the nominated brand innovativeness associations were above the threshold of 0.75 (Fleiss, 1981), providing support for inter-coder reliability. Next, the data were subject to simple frequency analysis. For a given word to be considered as a brand association, it needs to be retrieved at least two times (Nelson et al., 2000). The most important brand associations can be identified using frequency analysis to assess importance (Creswell, 1998). The results of the frequency analysis (see Table 2.1) indicate that innovative brands are related to creativity, uniqueness, newness, popularity, quality, usefulness, difference, forward thinking, technology and surprise. Moreover, innovative brands are related to several unexpected and surprising associations (e.g., design, simplicity, fun, colour, fashion, stylishness, cleverness, customisation and flamboyance) that have not been adequately captured in the current perceived innovativeness conceptualisations and operationalisations at the firm and product levels.

Table 2.1 Results of word association tasks study ($n = 100$)

F*	Key Innovativeness-related Associations at the brand level						
25	creative						
20	unique	new					
10	popular	design	quality	convenient-simple			
7	fun	useful	different				
4	functions	forward thinking	wow-surprise	technology	attractive		
3	interesting value	exciting clever, smart	fashion colour	stylish improving	first in the market adaptive	superior	
2	special	identifies needs of consumers	new ideas	new concept	cutting edge	reputation	features
	customer services revolutions	tasty user-friendly	recognisable flamboyant	expensive	new product	customisation	impressive

Note: * Frequency of the association when the two coders' categorisations were similar for the nominated association

However, by focusing on conscious brand knowledge, the above technique is not capable of providing insight into implicit brand knowledge (Koll et al., 2010). Also, listing the innovativeness-related associations would be of less value without considering the relationships between these associations in consumers' minds (i.e., identification of core and secondary associations). This is important because operationalisation efforts should mainly focus on core associations than secondary associations (Netemeyer et al., 2003). Therefore, to gain a deeper understanding about the associations identified from the free association tasks study, a brand concept mapping (BCM) study was also conducted.

2.5.2 Study A2: Brand Concept Mapping Study

In order to expand and confirm the results from Study A1, this study was aimed at identifying core and secondary innovativeness-related associations at the brand level, and how the associations are connected to each other in the consumer's mind. The data were collected using an open-ended elicitation procedure. This technique has been used in brand research (e.g., Eisingerich & Rubera, 2010) and allows consumers to retrieve deeper and more explicit brand knowledge at their own discretion. Another convenience sample of university students ($n = 103$, 56% female, $M_{age} = 21$ yrs) was asked to write the name of a brand [product category] (e.g., Samsung TVs) that they consider as an innovative brand [product category] and then write their thoughts about the nominated brand [product category] with reference to the following questions: "what comes to your mind when you think about an innovative brand?", "how would you describe an innovative brand?" and "why do you think some brands are more innovative than other brands?" Question wording was carefully designed for consistency with the innovativeness literature (e.g., Eisingerich & Rubera,

2010; Kunz et al., 2011; Quellet, 2006). See Appendix A.2 for the sample questionnaire. The questionnaires were distributed in an undergraduate class where students were given 10 minutes to undertake the task.

Data ($n = 103$) were thematically analysed. The writing length ranged from one to 19 lines (Times New Roman 12 pt. font and all four margins 2.54cm) with an average of six lines. The analysis constitutes aggregate (across-informant) brand knowledge. In order to reduce the potential effect of coders associated with manual content analysis techniques, computer-generated methods of coding were applied. Specifically, Leximancer software was used.

The Leximancer software provides a method for transforming natural language into semantic patterns in an unsupervised manner (Smith, 2003). Compared with manual content analysis techniques, Leximancer leads to the reduction of subjectivity with small investment of time and money (Smith & Humphreys, 2006). Thus, automation of this process reduces the costs related to validating code books, training coders and testing for inter-coder reliability (Smith & Humphreys, 2006). Most importantly, the technique has been found to provide valid and reliable concept mapping results (e.g., Smith & Humphreys, 2006). The main limitation of Leximancer is its inability to obtain much detailed grammatical information because the software does not account for word ordering within sentences (Smith, 2003). However, such information was not the focus of Study A2. Hence, this limitation did not affect the findings of Study A2 (see below).

2.5.2.1 Findings of Study A2

Participants named Adidas shoes, Apple iPhone, BMW cars, Channel fashion, Coca Cola soft drinks, Ebay online shopping, Facebook social media, Google search engine, Nike shoes, Samsung smart phones, Sony TVs, Toyota cars, and Virgin mobile as innovative brands [product category]. The results of the text analysis are presented in Figure 2.1 and Table 2.2. The results present a brand concept map (John et al., 2006) that is a network of innovativeness-related brand associations. To produce this map, Leximancer was set to ignore stop words (e.g., *the*, *and*, and etc.) and consolidate synonyms (e.g., brand = brands).

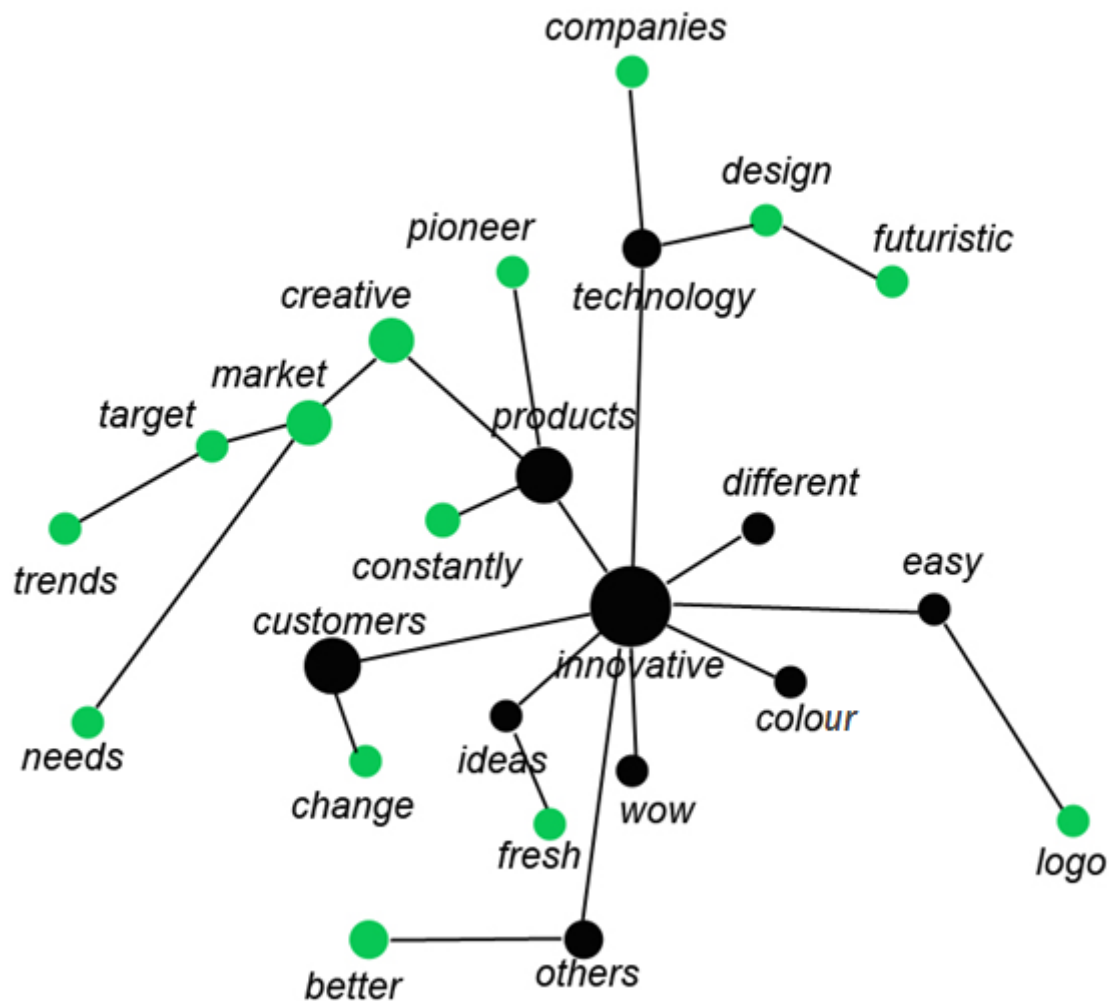


Figure 2.1 Innovative brand concept map (n = 103)
 Black nodes: core associations, Green nodes: secondary associations

Table 2.2 Results of BCM study (n = 103)

Core and secondary innovativeness-related associations			
Core	Related Secondary	Core	Related Secondary
ideas (19)*	fresh	different (26)	
other (44)	better	technology (26)	design, companies
wow (surprise) (2)		products (98)	pioneer, creative, constantly
colour (3)		customers (60)	change
easy (9)	logo		

Note: *Co-occurrence of the core associations with the node “innovative” is reported in parentheses.

A brand concept map could be considered an approximate representation for how brand associations are organised in the consumer mind consistent with the associative network memory model of Anderson (1983). The brand concept map identified the associations that are linked directly or indirectly (through other associations) to the brand and which associations are grouped

together. Hence, the innovative brand network of associations forms the image of innovative brands in the consumer's mind, allowing managers to identify effective strategies to leverage innovativeness image in the marketplace (Aaker, 1991). As illustrated in Figure 2.1, innovativeness is related to nine core (e.g., ideas) and nine secondary (e.g., fresh) associations. Core (black nodes) associations are directly linked to brand innovativeness. Secondary (green nodes) associations are indirectly linked to brand innovativeness.

To read the map, one starts from a core association, for example, "idea" and its connected secondary associations (i.e., fresh and creative) and keeps reading counter clockwise to reach the same place in the map consistent with the previous studies (John et al., 2006). To facilitate readability, the findings presented in the map are supported by relevant responses from participants below.

The concept map suggests that an innovative brand is associated with fresh ideas. The following account illustrates the importance of fresh ideas. "*An innovative brand is one which keeps continually creating new and fresh ideas*" (Respondent 69). Also, an innovative brand is perceived to be better than others. For example, the first respondent believes that: "*Samsung recently did well for the smart phone sales and services. It is better than Apple as well because it just beat iPhone 4 by getting the title the best smart phone in 2011*" (Respondent 1).

An innovative brand surprises consumers and makes them feel "wow", as described by Respondent 89: "*Innovative brands have the "wow" factor that sets them apart from their competitors and makes it so they can be branded as the best*". As stated before, innovative brands have strong associations with excitement, being imaginative (Aaker, 1997), distinctiveness, sophistication, and are more of a status symbol (Alpert & Kamins, 1995).

An innovative brand considers the importance of colour and logo in its brand elements (aesthetics), such that it "*stands out from others, [is] catchy, easy to say, sick colours, [and] has a logo you want to look at...*" (Respondent 84; "sick" in the Urban Dictionary, (n.d.) is defined as a sense of "crazy, cool, insane"). Aesthetic considerations such as size, shape, materials and colour have been stressed as performance associations in the literature (Keller, 2013). These associations which are grouped as design-related attributes (Keller, 2013; Verganti, 2008) are becoming more relevant to innovation consumption research as discussed by Dell'Era & Verganti (2011). Design is also mentioned as a secondary association connected to technology and futuristic associations. It seems that innovative brands pay attention to detail in their new products' designs and their offerings may look futuristic: "*When I think about an innovative brand, [the] first few words that come to my mind are the fancy design, high technology as well as a human friendly product*" (Respondent 36).

An innovative brand is unique and different: “*An innovative brand is one that will stick in my mind by being different*” (Respondent 16). Prior research found that consumers generally view these brands as more distinctive (Alpert & Kamins, 1995). In addition, as the BCM shows, innovative brands may have strong linkages with performance associations. The technology of a new product is an essential product-related attribute (Keller, 1993). An innovative brand uses advanced technologies as it is explained in the following account: “*Innovation is the application of new technology. Therefore it is important to see the visibility of this application*” (Respondent 38).

Furthermore, innovative brands constantly improve and offer creative products which contribute to their leadership: “*An innovative brand is brave as it introduces something new to the market, becomes a leader in their field and leads the rest of the market by continuously innovating and changing their product*” (Respondent 37). In this comment brand innovativeness is also linked to being brave, daring and up-to-date; behaviours that are acknowledged as personality associations in prior studies (Aaker, 1997). Finally, it is also said to be related to willingness to change and dynamic behaviour (Kunz et al., 2011): “*When I think of an innovative brand, I think of one that is dynamic and willing to change itself to meet the needs of the consumer rather than trying to convince a consumer to buy a product*” (Respondent 24).

The findings also confirm the results of Study A1 regarding the existence of some interesting core and secondary associations that are currently absent in the conceptualisation and operationalisation of innovativeness at the product and firm levels (e.g., colour, design and surprise). Furthermore, respondents’ writings about innovative brands were found useful in the item pool generation process of the CPBI measurement. Moreover, these qualitative findings were also used later for initial model validation of the CPBI processing model proposed in the present thesis (see Chapter 3 for details).

However, the directness of the design of the questionnaires in this study and the previous study (Studies A1 and A2) could be seen as leading to and effectively priming innovation responses (though it was not seen as a problem because even if primed their responses are natural and not directed to specific associations). Therefore, to further validate the findings of Studies A1 and A2 in terms of identification of some brand innovativeness associations which have not been addressed in previous conceptualisation and operationalisation of the construct in the literature, the cuing effect was examined in the opposite direction in Study A3.

2.5.3 Study A3: Validation Study

This study was aimed at validating the results from Studies A1 and A2 by cuing the respondents with *brand names rather than innovativeness as the stimulus*. By applying this technique, Study A3 examined if the previously identified innovativeness-related associations could

be extracted without reminding the consumers about innovativeness. The free association technique was used to evoke the top five associations for each nominated innovative brand name. Participants ($n = 82$ students, 60 % male, $M_{age} = 20$ yrs) were randomly assigned to one of the three versions of the questionnaire. In each version of the questionnaire five different innovative brand names were included (15 brand names in total). To choose the brand names, results from the BCM study (Study A2) were used in which respondents were asked to print innovative brand names (see Appendix A.3 for the sample questionnaire). For example, one version of the questionnaire, printed as a sample in Appendix A.3, was aimed at evoking the top five associations for innovative brand names of Louis Vuitton, Apple, Speedo, Coca-Cola and Toyota.

Each version of the questionnaire included two sections, following procedures described by Nelson et al., (2000). Section 1 was aimed at eliciting the first association that came to mind for the nominated innovative brand names. This section started with a short introduction for how to fill out the section. Respondents were asked to write the first word that came to their mind in response to each given word including the nominated innovative brand names. Specifically respondents read that:

In Section 1, you will see a list of words, each of which has a blank next to it. Your task will be to write in each blank the first word you think of that means the same thing as or is strongly associated with the word on the paper. There are no right or wrong answers. For example, if the word were “SKY”, you might write “EMIRATES”. If the word were “BEAUTIFUL”, you might write “CAT” or “PUPPY”. The proper way of indicating this word is:

SKY	<u>EMIRATES</u>
BEAUTIFUL	<u>CAT</u>

Respondents then read through a column of different words, in which five innovative brand names were interspersed among unrelated words (e.g., ocean, golf, and etc.) as well as other brand names which had not been named as an innovative brand in Studies A1-A2 (e.g., Volkswagen, Heinz and etc.). See Appendix A.3 for the sample questionnaire. The unrelated words included in section 1 of the questionnaire were selected from previous studies that used the same technique (Pappu & Cornwell, 2014). These words were constant across the three versions of questionnaires and none of them were previously named as a brand innovativeness association in Studies A1 or A2. The inclusion of unrelated words as well as non-innovative brand names in section 1 would distract respondents from focusing on only innovative brands when recalling the first association (Nelson, Dyrdal, & Goodmon, 2005; Nelson et al., 2002). Next respondents saw a blank page which asked them to attempt the questions in section 2, only after completing the questions in Section 1.

In section 2 of the questionnaire, respondents only saw the same targeted five innovative brands (e.g., Louis Vuitton, Apple, Speedo, Coca-Cola and Toyota) which were printed along with their logos. Respondents were asked to write four words that came to their mind for each of these brands (see Appendix A.3 for the sample questionnaire) following previous studies (Nelson, Dyrdal, & Goodman, 2005; Nelson et al., 2002). In total, participants were provided 10 minutes to complete the tasks.

2.5.3.1 Findings of Study A3

Results of the frequency analysis supported the previous findings from Studies A1 and A2. Almost half of the innovativeness-related associations (20 out of 43 associations) that had been listed in Studies A1 and A2 were identified by respondents in the validation study. Because of indirect cuing effects, this list of elicited associations was not as rich as those from the previous two studies. Specifically, respondents associated innovative brands with innovative, creative, unique, new, popular, design, quality, simple, fun, useful, technology, fashion, stylish, pioneer, value, colour, special, consumer services, tasty/delicious and expensive. The expected associations (e.g., creative, unique) as well as the surprising associations were produced (e.g., design, simplicity, fun, fashion, stylish and colour).

2.5.4 Exploratory Studies Summary of Results and Conclusion

Studies A1 to A3 aimed to determine how consumers defined brand innovativeness. The three exploratory studies show consistent results, including identifying some noteworthy brand innovativeness-related associations that current consumer perceived firm/product innovativeness conceptualisations and operationalisation have paid limited attention to (e.g., wow factor). Figure 2.2 summarises the findings from the literature review and Studies A1 to A3. CPBI shares “newness” as the essential association underlying the notion of being innovative with the concepts of CPPI (consumer perceived product innovativeness) and CPFI (consumer perceived firm innovativeness). Consistent with previous research on CPPI (Rubera et al., 2011), CPBI is associated with “being different”. Consistent with previous research on CPFI (Henard & Dacin, 2010; Kunz et al., 2011), CPBI is associated with “launching new product”, “trend-setter”, “leadership”, “innovative”, “dynamic”, “cutting-edge”, “changing market with its offers” and “constantly generating new ideas”. However, CPBI can be considered a distinct concept by being related to some other specific core and secondary associations such as “wow”, “colour” and “different from other brands”.

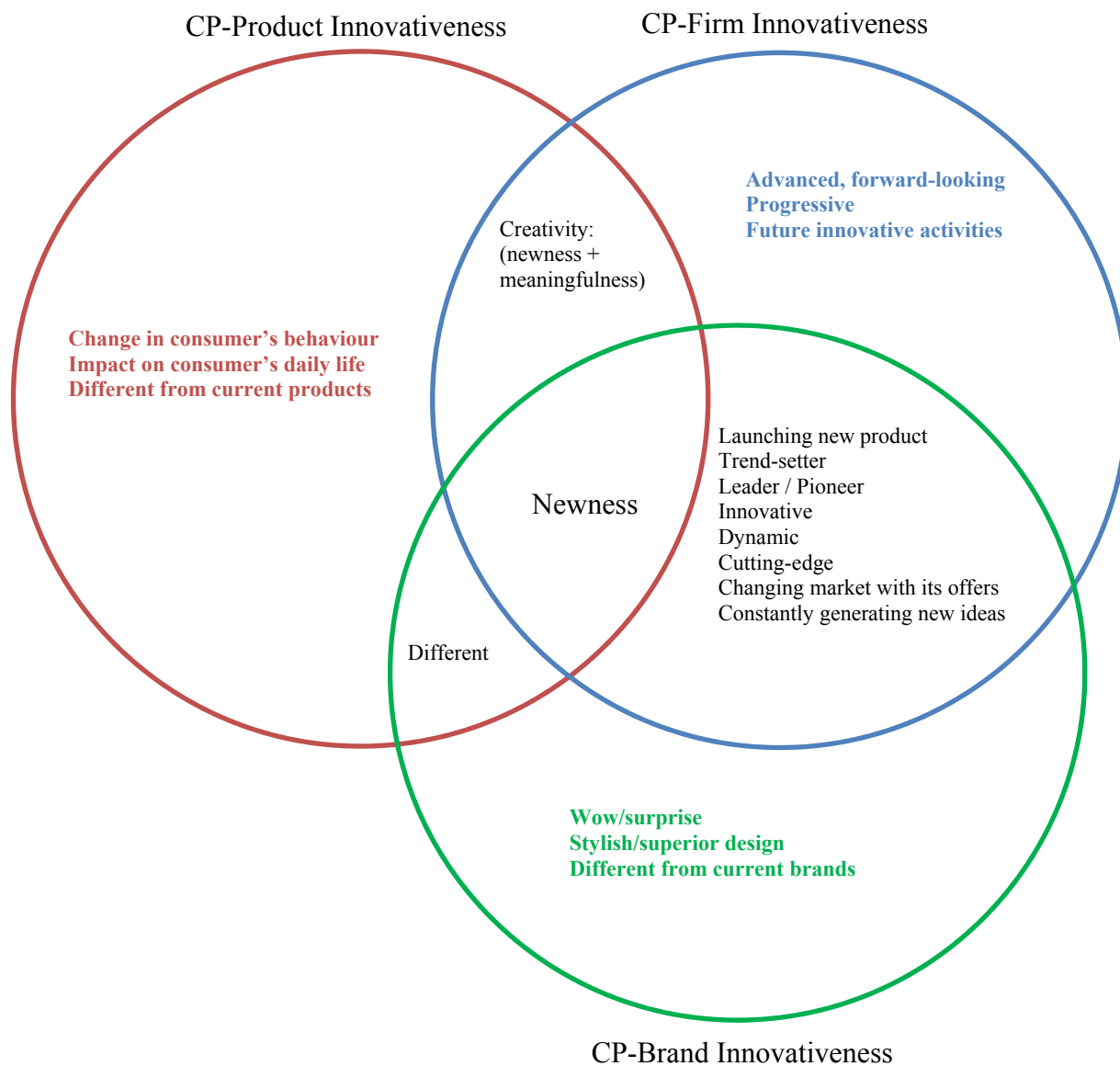


Figure 2.2 Consumer perceived (CP) innovativeness associations

Building on (1) the evidence provided in literature review and exploratory studies in favour of considering CPBI as a related but distinct concept from product or company innovativeness, and (2) the lack of a valid and reliable measure for CPBI, scaling studies examines how to operationalise CPBI consistent with the exploratory findings.

2.6 Scaling Studies Analysis and Results

Three complementary quantitative studies were conducted to address research question (2) how do we measure consumer perceived brand innovativeness? Built on the results of exploratory studies in the previous section and in accordance with the scale development literature, a

unidimensional 10-item scale for measuring CPBI was explored, confirmed and validated in Studies B1 to B3. These studies are presented below.

2.6.1 Item Generation and Content Validation

Following established guidelines for measure development (e.g., Netemeyer et al., 2003) a total set of 30 items was generated. This item pool originates from the review of the literature on consumer perceived innovativeness at the product (e.g., Dell’Era & Verganti, 2011), firm (e.g., Kunz et al., 2011) and brand levels (Eisingerich & Rubera, 2010), consumer innovativeness (e.g., Goldsmith & Hofacker, 1991), as well as the results of the exploratory studies. In addition, using a deductive approach, two expert judges were asked to suggest additional items based on the conceptual definition of CPBI. This is particularly helpful for constructs where no appropriate established scales could be identified in the course of the literature review (Fuchs & Diamantopoulos, 2012). Because the focus of these measures differs, not all items were appropriate to use and selected items needed to be adapted.

In order to assess the content validity of the identified items, three expert judges (marketing faculty members) and two PhD students were provided with the definition of CPBI (see Appendix B.1 for the sample questionnaire). The judges were asked to pay attention to content validity and representativeness. When two or more judges deemed an item not to be representative, the item was deleted. Also, some items were reworded to address the judges’ comments. This procedure yielded 19 remaining items. Examples of non-representative items deleted from the item pool are “It is not complicated to use [brand name]’s [product category name]” and “[Brand name] always consider product customisation as an important factor”.

In a second step, content validity of the items was further established by having two practitioners (sales managers) review the generated items’ relevance and adequacy with respect to what was intended to be measured (see Appendix B.2 for the sample questionnaire). The appropriateness of the included items was confirmed by the practitioners. Finally, an informal pretest was conducted to assess how the generated items worked in an empirical setting. Fifteen consumers participating in a pilot study were asked to rate their current mobile phone on the item pool on a seven-point Likert scale (see Appendix B.3 for the sample questionnaire). After the completion of the task, the researcher used the debriefing approach (Hunt, Sparkman, & Wilcox, 1982) to ask respondents about the clarity and readability of the questions. In the debriefing method, the respondent is asked to fill out the questionnaire completely while the researcher makes careful observations. After the questionnaire is completed, the researcher probes the respondent for any potential problems with the format of the questionnaire and with individual questions (Hunt et al., 1982). The overall feedback obtained from consumers was positive. Only one item was found to

be problematic ([Brand name] makes new smart phones with unusual colours) and thus eliminated. The resulting 18 item pool was retained for further (quantitative) analysis. These 18 items are listed in Appendix B.4.

2.6.2 Selection of Product Category and Brand Names

The choice of product category and brand names used in developing the CPBI scale was important. The brand names used must have a variance regarding consumer perceptions of brand innovativeness. An industry that contains multiple brands capable of eliciting this perceptual variance is a prerequisite (Henard & Dacin, 2010). Hence, the mobile phone category was selected which (a) offers variation in innovativeness, (b) has several well-established brands available to consumers and (c) has personal relevance for the young sample used. Moreover, the use of mobile phone technology in Australia has recently grown significantly and Australia is a world leader in mobile phone use (Department of Broadband, Communications and the Digital Economy, 2008). As of December 2011, the majority of Australian population (88 per cent of 14 years and above) owned or used a mobile phone (Roy Morgan Research Single Source, 2012). Finally, the mobile phone category has been used in previous consumer perceived innovativeness literature for scale development purposes and model estimations (Kunz et al., 2011).

Mobile phone brand names were identified that were perceived to be of high and low perceived innovativeness using a pre-test. A convenience sample of university students ($n = 75$) and non-student adults ($n = 25$) were asked to name their three most and three least innovative mobile phone brands. The results of frequency analysis indicated that participants considered Apple iPhone ($n = 103$), Samsung ($n = 98$) and HTC ($n = 40$) as the most innovative mobile phone brands and Nokia ($n = 73$), Motorola ($n = 39$) and BlackBerry ($n = 28$) as the least innovative mobile phone brands. These brand names were used in the main study.

2.6.3 Measure Development and Validation

Three studies (B1, B2 and B3) were conducted. Study B1 aimed at examining the factor structure of CPBI and identifying the most promising items. The discriminant validity of the CPBI scale was examined in Study B2. Predictive and comparative validities were further established in Study B3.

2.6.3.1 Study B1: Scale purification and refinement

A sample of 300 university students (60% female, $M_{\text{age}} = 21$ yrs) filled out a questionnaire relating to one of the six brand names in the mobile phone category (Apple: $n = 75$, Samsung: $n =$

57; HTC: $n = 30$; Nokia: $n = 49$; Motorola: $n = 51$ and BlackBerry: $n = 38$). The questionnaires were distributed in an undergraduate class and participants were free to choose which brand they would prefer to answer questions about. Respondents rated the 18 CPBI items on a seven-point Likert scale (1 = strongly disagree, 7 = strongly agree). See Appendix B.4 for an example.

More than 10% missing data is considered as problematic (Nunnally & Bernstein, 1994); the examination indicated only 0.5% of data missing, thus, there was no violation of the threshold in this data set. Also, The Mann-Whitney U -test indicated no significant differences between missing and non-missing groups at a 0.05 confidence level. Thus, the missing data were considered as random (Alford & Engelland, 2004; McQuitty, 2004). The mean substitution method was chosen to handle missing data because it provides all cases with complete information (Hair, Black, Babin, Anderson, & Tatham, 2010). A few outliers were detected using the Mahalanobis D^2 measure. Upon examination it was felt that these observations were not extraordinary in nature and may well represent a valid element of the population. Furthermore, the inclusion/exclusion of these data did not make any difference to the factor structure of CPBI or the results of the EFA and CFA examinations. Hence, they were retained for the purpose of statistical analysis. Finally, the data were checked and there were no major departures from the assumptions required for use of Maximum Likelihood estimation (e.g., independence of observations, multicollinearity, homoscedasticity and normality²).

Following established procedures in scale development (e.g., Netemeyer et al., 2003), first a series of exploratory factor analyses (EFAs) was conducted on the pool of items ($n = 18$). The KMO coefficient of sampling adequacy was 0.97 and significant. Maximum Likelihood analysis (direct oblimin rotation) yields a one factor structure (eigenvalue > 1) corresponding to the unidimensional conceptualisation of CPBI. Furthermore, the evaluation of the number of factors was qualitatively confirmed from the scree plot that was generated. Items that load higher than 0.60 are retained (Netemeyer et al., 2003), resulting in a 10 item pool for CPBI. The one-factor solution explained 61% of the common variance in the items. The coefficient alpha estimate of internal consistency was comfortably high ($\alpha = 0.95$).

Among the 8 items that were dropped from the scale 6 items produced factor loadings of less than 0.40. Two items - [Brand name] has a track record of successful new smart phones and [Brand name] is an advanced, forward-looking brand in the smart phone market – though produced factor loadings of 0.50 were dropped from the final scale. Item “[Brand name] has a track record of successful new smart phones” was dropped due to content validity issue. Even brands with unsuccessful records of product innovation may currently perceive as an innovative brand because

² Detailed discussions about *assumptions required for use of Maximum Likelihood estimation* are presented in testing the CPBI processing model, Chapters 4 and 5.

of a recent successful new product innovations. For example, the results of exploratory studies indicated that HTC was not among innovative mobile phone brands. However, two years later when scaling studies data collection was completed the results showed that HTC could build an innovative brand image in the mobile phone category and was named as a highly innovative mobile phone brand. Item “[Brand name] is an advanced, forward-looking brand in the smart phone market” was found to capture the same idea as of item “[Brand name] is a cutting-edge mobile phone brand” and is dropped to prevent un-necessary item redundancy (Netemeyer et al., 2003).

A series of confirmatory factor analyses (CFAs) on CPBI scale was subsequently performed. The overall fit statistics of the final CFA model was satisfactory ($\chi^2 [34] = 113.930, p < 0.001$; NFI = 0.956; CFI = 0.968; TLI = 0.958; RMSEA = 0.079; SRMR = 0.028) with all fit indices above and within the recommended cut-offs. All factor loadings were positive (0.74–0.85) and highly significant ($p < 0.001$). Squared multiple correlations for each item were also well above the recommended benchmark of 0.50 (Fornell & Larcker, 1981), ranging from 0.55 to 0.74. Finally, none of the absolute standardised residual covariance values were greater than 2.58. The final scale items are presented in Table 2.3. The composite reliability (0.95) exceeded the threshold of 0.80 (Hair et al., 2010; Raykov, 1997) and the average variance extracted (AVE) of the construct (0.67) was above 0.50 (Garver & Mentzer, 1999).

Table 2.3 CPBI final scale items ($n = 300$)

Items	Estimates*	t-value	Factor loading	Squared multiple correlations
1. [Brand name] sets itself apart from the rest when it comes to mobile phones.	1.17	14.79	0.74	0.55
2. With regard to mobile phones, [brand name] is dynamic.	1.25	17.69	0.84	0.70
3. [Brand name] is a cutting-edge mobile phone brand.	1.32	17.32	0.83	0.68
4. [Brand name] mobile phones make me feel “Wow!”	1.38	18.12	0.85	0.72
5. [Brand name] launches new mobile phones and creates market trends all the time.	1.42	17.76	0.84	0.70
6. [Brand name] is an innovative brand when it comes to mobile phones.	1.39	18.54	0.86	0.74
7. [Brand name] makes new mobile phones with superior design.	1.37	17.73	0.84	0.70
8. With regard to mobile phones, [brand name] constantly generates new ideas.	1.26	16.97	0.81	0.66
9. [Brand name] is a new product leader in the mobile phone market.	1.41	16.57	0.80	0.64
10. [Brand name] has changed the market with its mobile phones.	1.42	15.62	0.77	0.59

Note: * significant at $p < 0.001$

Although the result of the CFA model fit assessment did not pass the strict test of exact fit (chi-square test at $p = 0.05$), for the following reasons it was concluded that the unidimensionality of the proposed measurement was warranted: Chi-square test is very sensitive to sample sizes greater than 200 (Bentler, 2010); the proposed measurement is based on the result of three complementary studies in the exploratory phase; the item generation process was carefully examined and the scale passed excessive qualitative content validity examinations; item redundancy was not found to be an issue and it was concluded that every single item proposed a unique piece of information; brand innovativeness has been proposed as a unidimensional scale in previous studies (Eisingerich & Rubera, 2010) ; and similar established scales in the firm innovativeness literature (e.g., Henard & Dacin, 2010; Kunz et al., 2011) were proposed as unidimensional scales with more than seven items.

2.6.3.2 Study B2: Discriminant validity

In Study B2, discriminant validity of the CPBI scale vis-a-vis related constructs was examined. Participants (student sample, $n = 255$, 55% female, $M_{\text{age}} = 22$ yrs) again were asked to choose and fill out one of the six survey instruments (Apple: $n = 71$, Samsung: $n = 53$; HTC: $n = 24$; Nokia: $n = 48$; Motorola: $n = 29$ and BlackBerry: $n = 30$). They completed the CPBI scale and also scales measuring consumer perceived product innovativeness (CPPI) and consumer perceived firm innovativeness (CPFI). Specifically, CPPI was measured using a ten-item semantic differential scale ($\alpha = 0.92$) from Andrews and Smith (1996) which has been adapted in previous studies (e.g., Sethi et al., 2001). CPFI was measured using a seven-item Likert scale ($\alpha = 0.93$) of Kunz et al. (2011). See Appendix B.5 for the sample questionnaire and scales' items.

The sample size used in Study B2 was above the threshold of 200 and was adequate for the analysis (Hoelter, 1983). Similar to the procedures explained in Study B1, the data were checked and there were no major departures from the assumptions required for use of Maximum Likelihood estimation. Following procedures recommended by Bagozzi, Yi, and Phillips (1991) a series of CFAs were conducted. For each pair of constructs in the measurement model, I tested whether a two-factor model would fit better than a single factor model; namely nested model analysis. Nested models are those that contain some function of its free parameters equal to another free parameter or equal to a constant (Anderson & Gerbing, 1988). This thesis employs the chi-square difference test exhibiting a probability < 0.05 (Bollen, 1989; Byrne, 2010; Jöreskog & Sörbom, 1993). If the two-factor model provides significantly better fit than the one-factor (constrained) model then discriminant validity is supported. Chi-square difference tests indicated that, in all cases, the fit for the two-factor model was significantly better than the fit for the single factor model ($\Delta df = 1$; $p < 0.001$), providing support for discriminant validity (see Table 2.4).

Table 2.4 CFA results for discriminant validity ($n = 255$)

<i>Factors</i>	Two-factor model		One-factor model		$\Delta\chi^2$	Δdf
	χ^2	<i>df</i>	χ^2	<i>df</i>		
CPBI and CPPI	622.339	169	1016.183	170	393.844	1*
CPBI and CPFI	338.889	118	1416.353	119	1077.464	1*

Notes: * $p < 0.001$. CPBI = Consumer perceived brand innovativeness; CPPI = Consumer perceived product innovativeness; CPFI = Consumer perceived firm innovativeness.

2.6.3.3 Study B3: Predictive and comparative validities

To demonstrate predictive validity, the extent to which the proposed CPBI measure can effectively predict brand attitude, excitement toward the brand and consumer satisfaction was assessed. A positive relationship was expected between CPBI and brand attitude because brand attitude has been suggested in the literature as being important outcome of CPBI (Aaker, 2007). Based on associative network memory model (Anderson, 1984; Anderson & Bower, 1973), it could be argued that CPBI as an association in consumers' minds would lead to consumer attitudes and behaviours vis-à-vis the brand (Krishnan, 1996; Van Osselaer & Janiszewski, 2001). Furthermore, based on attitude theory (Fishbein & Ajzen, 1975) it has been theorised and found that consumer perceived innovativeness at the firm level has a positive impact on excitement toward the firm (Henard & Dacin, 2010). There is also empirical evidence to say that consumer perceived brand innovativeness positively affects consumer satisfaction and consumer loyalty (Pappu & Quester, 2013). Therefore, brand attitude, excitement toward brand and consumer satisfaction constitute valid criteria for testing the CPBI scale's predictive validity.

Following prior scale development studies (Fuchs & Diamantopoulos, 2012), the comparative validity of the CPBI scale was assessed by comparing the predictive ability of the measure relative to Eisingerich and Rubera's (2010) four-item scale of brand innovativeness. Specifically, I aimed to establish whether the CPBI measure was a better predictor of the above dependent variables than Eisingerich and Rubera's scale.

As per the procedure from Studies 4 and 5, participants (student sample, $n = 150$, 57% female, $M_{age} = 20$ yrs) filled out the survey instrument on one of the six mobile phone brands (Apple: $n = 57$, Samsung: $n = 52$; HTC: $n = 22$; Nokia: $n = 3$; Motorola: $n = 10$ and BlackBerry: $n = 6$) that they chose to complete. Respondents were asked to rate a mobile phone brand on the CPBI measure ($\alpha = 0.96$) as well as on previously established scales of the above interested variables and Eisingerich and Rubera (2010)'s four-item scale of brand innovativeness ($\alpha = 0.70$). Brand attitude was measured using a four-item semantic differential scale ($\alpha = 0.97$) of Holbrook and Batra (1987). Excitement toward brand was measured using a five-item Likert scale ($\alpha = 0.96$) based on

Henard and Dacin (2010). For consumer satisfaction the five-item Likert scale ($\alpha = 0.94$) of Stock (2011) was used. See Appendix B.6 for the sample questionnaire and scales' items.

According to Cohen (1992) for regression analysis of two independent variables, the required sample sizes for population effect size of medium to large are 97 and 45 respectively ($\alpha = 0.01$) and 67 and 30 ($\alpha = 0.05$) respectively. These sample sizes increase by increasing in the number of independent variables. Thus, the 150 sample size of the present study for only one independent variable per each bivariate regression analysis is adequate for analysis. Other studies used a sample size of 100 respondents for similar analysis (Fuchs & Diamantopoulos, 2012).

A series of bivariate regression analyses were conducted on the pooled data to test for the predictive and comparative validities. The data ($n = 150$) were checked and there were no major departures from the assumptions required for use of regression analysis (e.g., linearity, normality and multicollinearity). The result indicated that CPBI has a significant and positive effect on brand attitude, excitement toward the brand and consumer satisfaction. The strongest impact was on excitement toward the brand with a standard coefficient of 0.846 (see left panel of Table 2.5). Moreover CPBI explained 54% of the variance in brand attitude, 72% of the variance in excitement toward brand and 60% in consumer satisfaction (see left panel of Table 2.5). These results confirm the predictive validity of the CPBI scale.

Table 2.5 Predictive and comparative validities ($n = 150$)

	CPBI scale		E & R scale	
	β	R^2	β	R^2
Brand attitude	0.735*	0.541	0.514*	0.264
Excitement toward brand	0.846*	0.716	0.597*	0.357
Consumer satisfaction	0.778*	0.605	0.553*	0.306

*Notes: * $p < 0.001$. E & R = Eisingerich and Rubera (2010)*

Finally, a comparison between the results of the regression analyses provides clear empirical support for the comparative validity of the CPBI scale because the scale explains substantially more variance in the dependent variables than the Eisingerich and Rubera's scale (brand attitude: 54% vs. 26%; excitement toward brand: 72% vs. 36%; consumer satisfaction: 60% vs. 31%, respectively; see Table 2.5).

2.6.4 Scaling Studies Summary of Results and Conclusion

Studies B1 to B3 aimed at developing and validating a CPBI scale based on the CPBI conceptualisation developed from the literature review and through the exploratory studies. First, in

Study B1, a unidimensional 10-item scale was explored and confirmed for CPBI. The results of Study B2 provided empirical support for the distinctions among CPPI, CPFI and CPBI constructs by demonstrating discriminant validity of the CPBI scale vis-a-vis these constructs. In Study B3, predictive validity was supported by the strong relationship between the CPBI measure and brand attitude, excitement toward the brand and consumer satisfaction. Furthermore, Study B3 showed that the CPBI scale performs better in terms of predicting these dependent constructs than the only existing brand innovativeness scale (Eisingerich & Rubera, 2010). In sum, results of scaling studies support the view that the proposed unidimensional 10-item CPBI measure is valid and reliable.

2.7 Conclusion

In this chapter research questions 1 and 2 were addressed. First, the CPBI definition and conceptualisation was theorised based on (1) consumer perceived product, firm and brand innovativeness literature, (2) signalling theory (Spence, 1974) from information economics and (3) the associative network model of memory (Anderson, 1983). Next, the method, analysis and results of exploratory and scaling studies were reported. Three exploratory qualitative studies (Studies A1 to A3) were conducted to generate an enriched and more detailed understanding of what brand innovativeness means to consumers—CPBI conceptualisation. Data were collected using free association and open-ended elicitation techniques. Then, following established procedures for scale development, a CPBI scale was developed and validated in three quantitative studies (Studies B1 to B3)—CPBI operationalisation. Data were collected from six different Australian university student samples.

Altogether the six studies reported in this chapter confirm that the proposed CPBI conceptualisation and operationalisation is valid and reliable. The chapter presents the first brand concept map for the concept of innovative brands. The results of the studies indicate the measure's ability to successfully predict important consumer behaviour variables such as brand attitude, and to demonstrate superior predictive performance compared with the only currently available brand innovativeness scale from the consumer's perspective (Eisingerich & Rubera, 2010). More discussion of the findings and implications of these studies are provided in Chapter 6.

Given the lack of research and dearth of relevant literature in the area of brand innovativeness to date, rigorous examination of CPBI is a deserving research objective. One interesting topic from both a theoretical and practical perspective would be to discover if and how a firm's effort to offer product innovations would enhance CPBI. More extensive theoretical development and empirical testing of the consequences of CPBI on bottom-line performance measures such as purchase intention or market share is also an important issue worthy of further study. Finally, the above

scaling studies do not provide evidence for nomological validity of the CPBI scale. These research gaps are addressed in Chapters 3 and 4.

Results outlined in this chapter provide important foundations for developing the CPBI model. Further analysis of the qualitative data provided in Study A2 (BCM study) revealed initial support for the possible relationships between CPBI and its antecedents as well as its consequences. The process of initial model validation using the results of Study A2 is discussed in Chapter 3. In addition, results from predictive validity of the CPBI scale provided in Study B3, offer more solid justification for the development of the CPBI processing model in the next chapter. Finally, results from these six studies also suggest that a unidimensional conceptualisation of CPBI is warranted in future research (see also Figure 1.1).

Chapter 3 The CPBI Processing Model

3.1 Introduction

Chapter 2 theorised the CPBI conceptualisation and developed the CPBI measurement by answering two research questions. (1) How do consumers perceive innovativeness at the brand level? And (2) how do we measure consumer perceived brand innovativeness? Built on the findings from exploratory and scaling studies, Chapter 3 is aimed at theorising and developing the CPBI processing model with the focus on two further research questions: (3) do firms' effort to launch product innovations lead to CPBI? and if so, how exposure to the innovation affects consumer evaluations of the brand's innovativeness? and (4) what are the consequences of CPBI? To address questions (3) and (4), the following sections first provide a review of the key findings in the literature on consumer perceived innovativeness within its nomological network of relationships. The discussion elaborates the shortcomings of the current consumer perceived brand innovativeness literature. Next, the CPBI processing model proposed in this thesis is developed. Laboratory study (reported in the next chapter) is used to build upon insight gained in the six exploratory and scaling studies, including a conceptualisation and operationalisation of CPBI, by empirically examining the proposed CPBI processing model.

3.2 Background Literature

The brand innovativeness literature is very scarce. As reviewed in Chapter 2 there are a few studies that empirically examined consumer perceived innovativeness at the brand level. In an inter-disciplinary study, Mizik and Jacobson (2008) updated the Young & Rubicam Brand Asset Valuator model (Y&R BAV; www.yrbav.com) by adding brand energy to the initial four brand dimensions of differentiation, relevance, esteem and knowledge. Using secondary data from the consumer perspective, they tested the predictive validity of the updated Y&R BAV in explaining stock returns (return on assets: ROA and sales). They found that brand energy, which includes two dimensions of brand innovativeness and dynamism, provide incremental information to accounting measures in explaining stock returns. Although the study was one of the first to empirically examine the outcomes of consumer perceived brand innovativeness, it is limited in a sense that the analysis was narrowed to corporate brands (consumer perceived firm innovativeness: CPFII). As reviewed in Chapter 2, CPFII and CPBI are two distinct constructs and the consumer perceived innovativeness findings at the firm level may not always be generalisable to the brand level.

In the context of international marketing, the influence of culture on the impact of four key brand management elements (i.e., brand innovativeness, brand customer orientation, brand self-relevance, and social responsibility) on customer commitment to a brand was examined in another study (Eisingerich & Rubera, 2010). Using responses from U.K. and Chinese consumers, the authors found that brand innovativeness had a greater effect on brand commitment in cultures that are individualist, short-term oriented and low on power distance (i.e., the United Kingdom). However, as detailed in Chapter 2 (see Section 2.2.3 Consumer Perceived Brand Innovativeness for a detailed discussion), the research confounded the notion of consumer perceived product innovativeness (CPPI) with consumer perceived brand innovativeness (CPBI), not recognising that the concept of brand is different and broader than the concept of product. This limitation also applies to the study by Boisvert and Ashill (2011), in which the authors found that brand innovativeness of a service extension (or more precisely; consumer perceived product innovativeness) positively impacted attitude toward service extension.

More recently, in an examination of advertising persuasiveness, Barone and Jewell (2014) found that the influence of the competitive advertising context (how typically or atypically advertising tactics are employed by brands in a product category) on an advertisement's persuasiveness (measured by attitude towards the advertisement) was moderated by consumer perceived brand innovativeness, because innovative brands enjoyed higher advertisement flexibility. The study does not exactly define the construct *consumer perceived brand innovativeness* and in their experimental approach, CPBI was manipulated as high versus low innovative brands using different brand names of laptops (e.g., Sony and Getaway). Finally, consumer perceived brand innovativeness has been found to positively affect consumer satisfaction (Pappu & Quester, 2013). However, by the time of the present thesis submission, the Pappu and Quester's paper was under review for a journal publication. Thus, it was not possible for the author to provide more detailed criticism of this article. Together, although the current emerging literature provides a few evidences for the consequences of consumer perceived brand innovativeness (e.g., stock return, brand commitment, attitude toward service extension), the findings are limited by confounding CPBI and CPPI (Boisvert & Ashill, 2011; Eisingerich & Rubera, 2010) or CPBI and CPFI (Mizik & Jacobson, 2008).

In addition to these shortcomings regarding the outcomes of consumer perceived brand innovativeness (CPBI), CPBI was hardly the main focus of the research in the above studies. Specifically, the literature does not address what are possible drivers of CPBI and how these drivers may be influential in enhancing CPBI. For instance, while product innovations have been highlighted as a possible driver of CPBI (Aaker, 2007), yet no empirical study has examined if and how firms' effort to launch product innovations lead to CPBI? While from a brand's perspective

one of the main goals of new product developments is to signal a brand innovativeness image to its consumers (Aaker, 2007), such lack of consideration of the CPPI in the study of CPBI is particularly at odds with the huge cost of new product development programs for each innovation (Srinivasan et al., 2002).

Consumer perceived product innovativeness literature is almost silent on the relationships between CPPI and CPBI. The research has mainly focused on: (1) conceptualisation and measurement of the construct (for a detailed review see Section 2.2.1 Consumer perceived product innovativeness); (2) the effect of CPPI on purchase intention (e.g., Alexander, Lynch JR., & Wang, 2008; Rubera et al., 2011), new product advantage and profitability (Calantone et al., 2004; McNally et al., 2010), new product performance (Lee & O'Connor, 2003), firm performance (e.g., Avlonitis & Salavou, 2007; Cillo, de Luca & Troilo, 2010); and (3) possible drivers of CPPI such as technological newness, perceived newness, relative advantage (Lowe & Alpert, 2013), team level factors of social cohesion and superordinate identity (Sethi et al., 2001), entrepreneurial orientation of a firm (Avlonitis & Salavou, 2007), technical synergy within a firm (Calantone et al., 2004) and market information approaches of a firm (Cillo et al., 2010). Thus, the current CPPI literature does not provide insight on the relationship between CPPI and CPBI.

Although research on CPPI does not address the aforementioned gap, the extensive history of brand extensions provides some initial evidence for the relationship between a new product as an extension and the parent brand. For example, it has been found that different brand characteristics such as brand attitude (Aaker & Keller, 1990), brand image (Boisvert, 2012), brand familiarity (Martinez & Pina, 2010), perceived brand quality (Smith & Park, 1992; Völckner & Sattler, 2006), brand credibility (Kirmani, Sood, & Bridges, 1999), brand experience (Swaminathan, Fox, & Reddy, 2001) and brand-extension fit (Milberg, Sinn, & Goodstein, 2010) affect consumer perception about the extension. Also, consumer perception about the extended new product has been found to impact consumer perceptions of the parent brand's attitude (e.g., Aguirre-Rodriguez, Bóveda-Lambie, & Montoy, 2013; Keller & Aaker, 1992) and overall brand image (e.g., Bravo, Iversen & Pina, 2011; Loken & John, 1993; Martinez & Pina, 2003; Sullivan, 1990).

While rich, brand extension literature has one fundamental limitation: Surprisingly, the research to date has not looked at consumer perceived innovativeness neither at the product nor at the brand level. Consumers' evaluations of the new extended product are mainly limited to the attitude toward the extension (Aaker & Keller, 1990; Bravo et al., 2011; Grime, Diamantopoulos, & Smith, 2002; Martinez & Pina, 2010; Milberg et al., 2010) and perceived quality of the new extended product (Keller & Aaker, 1992; Völckner & Sattler, 2006), leaving the CPPI evaluation of the extended product unexplored. Thus, it is very difficult to conclude that the so called *new* extended product in these studies was even perceived as a new offering. Similarly, few, if any, of

prior studies in this stream of research considered CPBI as a possible consumer evaluation for the parent brand.

Overall, the current literature built on multiple research streams, including CPBI, CPPI and brand extensions, is generally silent on if and how exposure to a product innovation may affect consumers' perception about brand innovativeness (CPBI), and provides little insight on what the consequences of this CPBI are. Addressing these research gaps, in the next section, a conceptual model of CPBI will be presented.

3.3 The CPBI Conceptual Model

As is more fully developed subsequently, I propose that when a brand introduces an innovation to its consumers, several factors influence the consumer perceived innovativeness level of the focal brand, including pre-existing consumer perceived brand innovativeness (pre-CPBI), the level of innovativeness consumers attribute to the product innovation (CPPI) and the technological newness of the product innovation (TN). First, Pre-CPBI and TN influence CPPI. Post-CPBI is then built on the resulting CPPI and pre-CPBI. Finally, post-CPBI will lead to enhancement in brand attitude and consumer purchase intention.

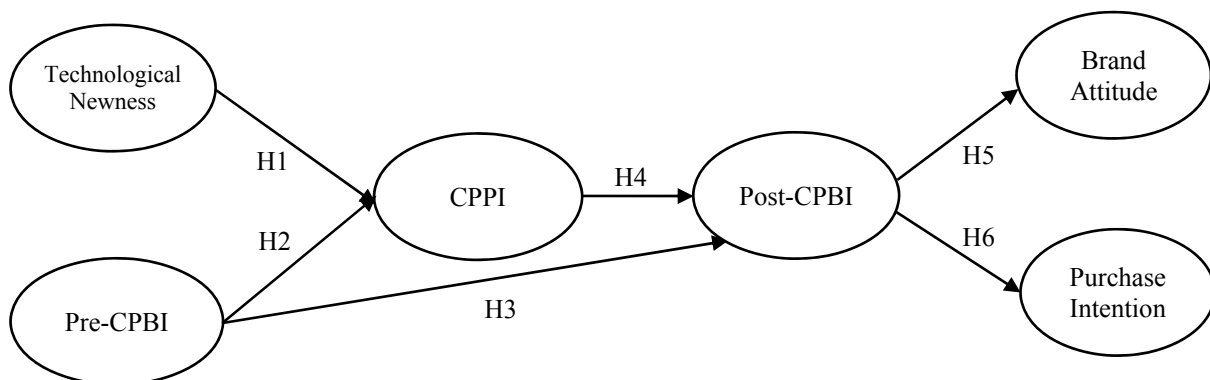


Figure 3.1 Consumer perceived brand innovativeness (CPBI) processing model

Notes: All arrows represent positive effects; CPPI = Consumer perceived product innovativeness; Pre-CPBI = Consumer perceived brand innovativeness prior to introduction of the innovation; Post-CPBI = Consumer perceived brand innovativeness after introduction of the innovation.

In other words, when consumers are exposed to a marketing stimulus such as an innovation, their current perception of the innovativeness level of the brand and their perception about technological newness of the new product influence how they perceived product innovativeness. Based on this perception and their current perception of brand innovativeness they make a judgement about brand innovativeness. The resulted consumer perceived brand innovativeness will then positively impact brand attitude and consumer purchase intention. Figure 1

captures the hypothesised relationships. The conceptual model relies on the findings from the brand concept map study (Study A2), the concept specialisation model (Cohen & Murphy, 1984; Hampton, 1987; Murphy, 1988), information integration theory (Anderson, 1971, 1981a) and the associative network memory model (Anderson, 1984; Anderson & Bower, 1973).

3.3.1 Evaluations of Consumer Perceived Product Innovativeness (CPPI)

3.3.1.1 The effect of technological newness on CPPI

Regarding the relationship between product innovations and brand innovativeness, one finding to emerge from the brand concept map exploratory study (Study A2) was the direct association between brand innovativeness and the core association of technology. An innovative brand launches new products that feature new technologies. Perceived technological newness is the extent to which the technology involved in a new product is different from prior technologies (Chandy & Tellis, 1998). Keller (1993) argues that the technology of a new product is an essential product-related attribute. Many respondents seemed to attribute innovativeness to new products that reflected some technological newness. For instance, *“Innovation is the application of new technology”* (Respondent 38), *“constantly improving products upon current technology”* (Respondent 38). Respondent 31 named Sachs (a German based motorcycle manufacturer) as an innovative brand and explained his perception about an innovative brand as *“It provides cutting edge technology into a motorcycle. It is innovative because it produces products that are radically different from other motorcycles”*. It seems that a new motorcycle by Sachs is the one with new technology. Similarly Respondent 14 described Apple iPod as *“a small device created with design and modern technology”*.

It is possible that consumers heavily weight technological newness for the innovation. This weighting could have been partially responsible for the success of the Dyson vacuum cleaner, which revolutionised the vacuum industry by providing bagless cyclonic vacuums. In addition to a highly technologically new product, Dyson allowed consumers to see how the innovation worked by making the casing transparent and the technology observable as illustrated in Respondent 38’s statement: *“It is important to see the visibility of this application [new technology in the new product]”*. Previous studies in the consumer perceived product innovativeness literature suggest some reasons for the importance of technological newness. Highly technologically new products (1) promise greater benefits (Alexander et al., 2008); for example: *“When I think of its products [the innovative brand’s products] it makes me feel as though technology is very useful in assisting me with many everyday lives”* (Respondent 20), and (2) enable consumers to do things that cannot be easily done with existing ways to solve similar problems (Hofler, 2003); for example: *“The way*

that the iPhone, iPad, iMac etc. link together is very innovative and has changed the way people use technology. It has simplified how people store information, photos, etc.” (Respondent 56).

Literature provides some broader concepts that may have been involved in the respondents’ assessments of technological newness. Perceived technological newness may be related to the perceived difficulty of creating the innovation (Johnson & Folkes, 2007), which shares a positive relationship with a consumer’s overall evaluation of a new product (Bottomley & Holden, 2001). Seemingly easy achievements, such as adding a twist to an old technology, do not earn admiration as much as a difficult technological advance. The greater the sheer intellectual achievement of the innovation the more consumers give credit for its achievement. Therefore, although the technology behind some innovations may not be clearly visible to consumers it appears as if consumers may form a judgment about how technologically new a product is and this perception may influence their evaluations of a product’s innovativeness.

The literature offers more direct support for the effect of perceived technology newness on perceived innovativeness. For example, brands may launch and sell radically new products on the basis of the “sophistication and complexity of their technological attributes” (Gima, 1995; Urban, Weinberg, & Hauser, 1996), and other researchers (e.g., Chandy & Tellis, 1998; Sorescu, Chandy, & Prabhu, 2003) have highlighted the importance of technological newness as an important factor in determining perceived product innovativeness. Therefore, a systematic relationship seems to exist between perceived technological newness and CPPI:

Hypothesis 1: Perceived technological newness positively impacts consumer perceived product innovativeness.³

3.3.1.2 The effect of pre-CPBI on CPPI

Concept combination theory (Cohen & Murphy, 1984; Smith, Osherson, Rips, & Keane, 1988) offers useful conceptual guidance to argue for the effect of pre-CPBI on CPPI. According to this theory, people view and process group of concepts as a composite entity. The process of composition has been described with two models; namely, concept specialisation model (Cohen & Murphy, 1984; Hampton, 1987) and the selective modification model (Smith et al., 1988). The latter model specifically examines how adjective-noun combinations (e.g., fantastic Samsung) are perceived, while concept specialisation model was developed in the context of noun-noun conjunctions (e.g., Samsung Galaxy). Because (1) the focus of the present thesis is on noun-noun

³ From the present thesis’s perspective perceived technological newness has been defined as the extent to which the technology involved in a new product is different from prior technologies (Chandy & Tellis, 1998). Thus, the technology is not a stand-alone notion in the marketplace. As Keller (1993) argues that the technology of a new product is an essential product-related attribute. Hence, all the effects of technological newness on brand attitude and purchase intention is through product innovation. The findings of laboratory and field studies also support the indirect effect of technological newness on consumer perceived brand innovativeness, brand attitude and purchase intention.

combinations and (2) noun-noun conjunctions incorporate the adjective-noun composites (Murphy, 1988), the concept specialisation model is used to develop the relationship between pre-CPBI and CPPI.

According to the concept specialisation model (Cohen & Murphy, 1984; Hampton, 1987; Murphy, 1988), in a noun-noun composite, the relationship between the two concepts is described in terms of modifier and modified concepts, such that usually the preceding concept acts to modify the last concept. For example, in the composite concept “Samsung Galaxy”, “Samsung” is the modifier and “Galaxy” is the modified concept. However, the composite of brand name and new product name may sometimes be different. Composite concepts typically include two nouns, while brand-new product names may involve three nouns (e.g., Samsung Galaxy S5). The composite concept literature proposes the nested concept formation process as an intermediate step before the composite concept formation (Murphy, 1988; Park, Jun, & Shocker, 1996; Schmitt & Dube, 1992). In the example of Samsung Galaxy S5, consumers first go through the process of nested concept formation for “Galaxy” and “S5”. Next, this nested concept is combined with “Samsung” by the process of composite concept formation. Nested concept formation process occurs when “a salient attribute of the nested concept assumes the value of the same attribute of the nesting concept, because the nesting concept has less variability on the attribute in question than the nested concept” (Park et al., 1996, p. 455). The process is qualified by a one-way value transfer from the nesting noun to the nested noun (Park et al., 1996; Schmitt & Dube, 1992). In the example of Galaxy S5, the S5 concept is nested under the Galaxy concept, because as a model number it has greater variability than does the specific model name of Galaxy (Jo, 2007). In the second step, explained below, the composite concept of Samsung Galaxy S5 is interpreted⁴.

According to the concept specialisation model, both modifier and modifying names are associated with a set of attributes which contribute to attribute formation of the composite. The theory proposed four mechanisms to explain how attributes in a composite concept are formed by the underlying concepts; namely union, maximum, minimum and averaging rules (Cohen & Murphy, 1984; Hampton, 1987; Murphy, 1988). According to the union rule, if an attribute is salient (or not salient) for both underlying concepts, it is also salient (or not salient) for the composite concept. A maximum rule applies when an attribute (e.g., innovativeness) is salient for one of the underlying concepts but not for the other. In this situation the composite concept will include that salient attribute. If an attribute is perceived impossible for one concept, the minimum rule applies and the attribute will not affect the attribute formation of the composite concept. Finally, the combinational formula approximates the averaging rule when the attributes levels are in the midrange. Applying to the context of CPBI, when a brand introduces a new product (e.g.,

⁴ The discussion can easily be generalised to other brand-new product examples (e.g., Toyota Corolla SX).

Samsung introduces Galaxy S5), because the brand name has an established associative network and is more familiar, its characteristics are more salient compared to a newly introduced product, and it is very likely that the attribute transfer flows from the brand to the product, following the maximum rule (Hampton, 1987; Jo, 2007).

Similarly, the literature on consumer inference-making suggests that consumers' judgments of a new product or service is formed in the presence of the parent brand and the brand provides a context for the product evaluation (e.g., Lynch, Chakravarti, & Mitra, 1991; Lynch, Marmorstein, & Weigold 1988; Simmons & Lynch 1991). Consumers may form inferences about missing product attributes by drawing a connection between an available piece of information (e.g., a brand's innovativeness) and the missing attribute (e.g., product sophistication, innovativeness) (Brown & Dacin, 1997; Dick, Chakravarti, & Biehal 1990). Consumer perceived brand innovativeness (CPBI) association is one likely source for inferences about new product attributes. One important product attribute that may be influenced by CPBI association is consumer perceived product innovativeness. Thus, it is expected that the perceived innovativeness of the brand at the time of introducing the new product (pre-CPBI) affects perceived innovativeness of the product (CPPI). In the example of Samsung Galaxy S5, CPPI of the Galaxy S5 is affected by the CPBI of Samsung (in the mobile phone category) prior to introducing this new product.

Also, built on brand equity theory (Keller, 2013) the literature on brand naming strategies and brand hierarchy supports the above argument. A brand hierarchy "is a useful means of portraying a firm's branding strategy by displaying the number and nature of common and distinctive brand elements across the firms' products, revealing the explicit ordering of brand elements" (Keller, 2013, p. 16). The example of Samsung Galaxy S5 consists of three different brand name elements, "Samsung", "Galaxy", and "S5". Samsung uses its family (i.e., umbrella) brand name to many of its products, but Galaxy designated a certain type of tablet, and S5 identifies a particular model of Galaxy (Wernerfelt, 1988). It has been argued that brands such as Samsung with stronger associative network play an important role in association formation of a new product (Keller, 2013; Montgomery & Wernerfelt, 1992). As discussed above, it is very likely that the attribute transfer flows from the brand to the product (Erdem, 1998, Erdem & Chang, 2012; Keller, 2013; Wernerfelt, 1988). For example, Keller and Aaker (1992) experimentally showed that brand image of being innovative could product favourable associations and increase the acceptance of the new product.

It was not expected that preliminary evidence for the effect of brand innovativeness on product innovativeness would be found in the brand concept map study (Study A2), because the main purpose of that study was to eliciting core and secondary innovativeness-related associations at the brand level, rather than the product level. However, some of the respondents indirectly

expressed the idea that that when a new product is introduced, the transfer of associations flowed from the brand to the new product. For example, Respondent 7 believes that it is the innovative brand which explains the product to consumers: “*It [innovative brand] is not so complicated, and it can express its product*”. In addition, Respondents 16 and 18 statements express their feelings and judgments regarding new products specifically in the context of their parent brand. It seems that these product perceptions are influenced by their brand perceptions.

“*They [consumers] clap when an Apple product is bought*” (Respondent 16).

“*Apple products are always super modern and rarely have severe faults and other brands tend to copy them as Apple products are usually the first of their kind*” (Respondent 18).

Based on the above argument the following hypothesis is advanced:

Hypothesis 2: Pre-consumer perceived brand innovativeness positively impacts consumer perceived product innovativeness.

3.3.2 Evaluations of Consumer Perceived Brand Innovativeness (CPBI)

3.3.2.1 The effects of CPPI and pre-CPBI on post-CPBI

I draw on information integration theory (IIT; Anderson, 1971, 1981a, 1981b, 1991; see also Fishbein, 1967) to provide a theoretical foundation for the effects of pre-CPBI and CPPI on post-CPBI. Resting on a mathematical basis, information integration theory explains the process by which a person’s opinion, belief or attitude is formed from integrating different informational stimuli (Anderson, 1981a). According to this theory, attitudes or beliefs are formed and modified as people receive, perceive, assess, and then integrate stimulus information with their existing cognitions or thoughts. The theory has been successfully applied in several fields of psychology and marketing: cognitive psychology (Birnbaum, 2008), social psychology (Shanteau & Nagy, 1979), organisational psychology (Louviere & Islam, 2008), advertising (Kim, Yoon, & Lee, 2010), brand pioneership and order of entry (Kardes & Kalyanaram, 1992), brand naming strategies (Park et al., 1996) and methodology (Hofmans, Theuns, & Mairesse, 2007), to quote a few.

Information integration theory assumes that the ideas in a persuasive message are pieces of information and that people consider subjective values for different pieces of information. It posits that people combine these subjective values using a cognitive algebra, which is dominated by addition, multiplication, and averaging. Upon exposure to a new piece of information, the person engages in a two stage process: evaluation and integration. Evaluation refers to the determination of the importance (i.e., weight) of the information and integration is a process of combining these weighted pieces of information. Each piece of information is represented by two parameters: a scale value, s , and a weight, w . The scale value is the location of the informational stimulus along the

dimension of judgment, while the weight (i.e., salience) is regarded as the psychological importance of the information (Anderson, 1981a). In other words, the value is a piece of information's evaluation (favourable or unfavourable) and the weight of a bit of information is its perceived importance.

Consider this simple example; Sam tells Ben that Samsung has introduced Galaxy S5 mobile phone. The value of this information is whether Ben thinks this new product introduction (for Samsung) is good (attractive) or bad (unattractive or inappropriate). The weight is how much Samsung's mobile phones matter to Ben. If it does matter (has some weight) and if Ben thinks it is good for Samsung to introduce this new product, then this piece of information inclines Ben to have a favourable thought toward Samsung in the mobile phone market. However, Ben's new attitude would also depend on what he thought about Samsung mobile phones before he learned about Samsung's new product. If he previously had a favourable attitude toward Samsung, his attitude would remain favourable. It could become even more favourable, especially if he thought introducing Galaxy S5 was very important (if this information had a larger weight) and if he really liked Samsung Galaxy S5 (if the information had a high positive value). On the other hand, if Ben used to have an unfavourable attitude toward Samsung mobile phones, this new piece of information probably would not change his thoughts from unfavourable to favourable. It could mean that his new attitude was not as negative as before, especially if this new piece of information had a large weight and a high positive value. IIT argues that when people obtain new information (often from persuasive messages), the new information influences their attitudes/thoughts. The new piece of information does not replace people's existing attitudes/thoughts.

The above argument is described in terms of a simple algebraic formula. Suppose that the person receives N pieces of stimulus information. If the scale value of Stimulus i is S_i and its weight is W_i , the opinion or belief about the subject under study, after receiving the informational stimuli is then,

$$R = W_0S_0 + W_1S_1 + W_2S_2 + \dots + W_nS_n$$

where W_0 and S_0 are the weight and value of the person's initial opinion or belief about the subject under study, prior to receiving the informational stimuli.

Two different models have been proposed for the rules of integration, namely adding and averaging models. While in the adding model people are assumed to add each piece of information, in the averaging model people integrate each new piece of information by averaging it with the existing set of integrated information. In the above simple example, consider Ben has a high CPBI of 5 (on a scale of 1 to 7) for Samsung mobile phones. If he learns a new piece of information (say, Samsung introduces Galaxy S5) that is not highly innovative for him, say a 2 for CPPI, what will his new CPBI be for Samsung? If he adds 5 and 2, then Ben's new CPBI will be higher than his

existing CPBI, a 7. On the other hand, if Ben averages the new and old information his new CPBI should be less favourable, a 3.5 (5 plus 2 is 7, divided by 2 pieces of information, equals an average of 3.5)⁵.

Several studies have addressed the question of whether new information is added to existing knowledge, or whether it is averaged into it (c.f., Anderson, 1965; Rosenberg, 1968). However, the literature does not clearly support either adding or averaging models. It has been also argued that in many cases the two integration techniques have made the same predictions (Anderson, 1971, 1981a). Exploring the effectiveness of these methods of integration is not within the scope of the present thesis. However, the fundamental argument of IIT, that people do combine new and old information to create new thoughts, guides the hypotheses development for the effects of pre-CPBI and CPPI on CPBI.

Applying to the context of consumer perceived brand innovativeness (CPBI) in this thesis, the product innovation potentially represents new evaluations and associations for the brand and acts as an informational stimulus. Thus, when consumers are exposed to a product innovation by the brand, they will be involved in the process of evaluation of the information related to the new product and integration of this new information with their current opinion about the brand. The resulting perception about the brand after introduction of the innovation is then,

Post-perception of brand A = Pre-perception of brand A + Perception of the innovation

Employing the perception of innovativeness in the formula, post-CPBI results from pre-CPBI and consumer perceived product innovativeness (CPPI). For example, both CPPI of Lumia 2520 and CPBI of Nokia in the tablet market prior to the introduction of Lumia 2520 influence CPBI of Nokia in the tablet market after the introduction of this product innovation.

Similarly, in the brand alliance context, previous research observed that when two brands participate in an alliance for a bundle product, attitudes toward the parent brands and attitude toward the bundle product contribute in the formation of post attitude (after introduction of the bundle product) toward parent brands (Simonin & Ruth, 1993). Applying a different approach, Keller and Aaker (1992) found that a prior, successful extension results in improved evaluation of not only a proposed extension product but also the core brand itself. Results of the brand concept map, reported in Study A2 show that from the perspective of many respondents, product innovation is a big contributor for their perception of brand innovativeness. Some examples are provided below:

⁵ Please note that these are simple examples to show how the formula works. Many attitudes are complex and they may not have only one dimension. Often we have both positive and negative ideas about a brand or new products. An attitude toward a new product that is favourable overall may be made up from both favourable (nice colour, user-friendly, hi-tech) and unfavourable (small screen, expensive) thoughts. The formula is best to be considered as approximations of what human beings may do without numbers, because in reality people do not place figures to pieces of information; neither do they perform mathematical calculations to figure out their new perceptions.

“When I think in a specific innovative brand, the first thing that comes to my mind is the product that they made and actually had an impact in my life i.e. Google docs where you can work in a doc at the same time your friend is, great for group assignments. An innovative brand is the one that brings a product to the market to satisfy a specific need in a way that no one has done before” (Respondent 3).

“Innovative brand is about an invention or product that hasn't been made or sold before” (Respondent 10).

“I'm pretty sure the brand is ‘Sketch Shoes’—I consider this brand of shoes ‘innovative’ as they have changed the style, purpose and concept of a shoe” (Respondent 12).

“Consistently offering new ideas, products or services both large and small more than competitors and well in advance” (Respondent 17).

“Coca Cola or McDonalds, Pizza Hut, KFC are also innovative as they could offer new products to the market” (Respondent 76).

“They constantly improve their products to better cater to customer need, and anticipate what customers want in their product. Brands like Apple, with their constant improvement from an iPod to iPhone to iPad are innovative as they bring out products that customers have never seen before” (Respondent 89).

It was not expected that respondents were able to describe the process of post-CPBI formation in their thoughts as the integration process mainly happens unconsciously, even when respondents were specifically asked to think about the process in their thoughts (Anderson, 1981a, p. 108). However, one case was found that indirectly referred to the prior or initial level of CPBI for a brand and the impacts of both product innovations and pre-CPBI on post-CPBI. Respondent 17 stated that *“Innovative brands are capable of showing/highlighting new products or services to consumers. Strong marketing base helps with innovation, if consumers don't know a brand is innovative then being so is pointless”*. First, this respondent clearly expresses the opinion that new products are important contributors for a brand to be perceived as an innovative brand. Second, he is also suggesting that for a brand to be innovative, some level of initial knowledge about its innovativeness is effective too, otherwise introducing a new product does not seem to be adequate, or as he put it, “is pointless”. In other words, what this respondent knows about innovativeness of a brand before the introduction of product innovation does matter. Third, he is indirectly providing a solution for a brand to create a synergy between the two factors of pre-CPBI and CPPI: a strong marketing base. The word “showing/highlighting” in the first sentence suggests that the term “strong marketing base” may then refer to some sort of advertising that sends the message about the new product for the brand. Interestingly, the main elements of the theory are mentioned together in

Respondent 17 statement; namely pre-thoughts, persuasive message (advertising), informational stimuli (new product) and post-thoughts.

Based on the forgoing argument the following hypotheses are advanced:

Hypothesis 3: Pre-consumer perceived brand innovativeness positively impacts post-consumer perceived brand innovativeness.

Hypothesis 4: Consumer perceived product innovativeness positively impacts post-consumer perceived brand innovativeness.

3.3.3 Evaluations of the Outcomes of Consumer Perceived Brand Innovativeness (CPBI)

3.3.3.1 The effect of post-CPBI on brand attitude

As detailed in Chapter 2, the associative network memory model (Anderson, 1984; Anderson & Bower, 1973) offers useful conceptual guidance to argue how innovative brands are represented in memory and processed by consumers (see Section 2.3.2 The Associative Network Model of Memory for more details). According to this theory, a brand can be seen as a node in the consumer's memory which is linked with different associations of varying strengths (Keller, 1993). The strengths and favourability of these linkages would translate to the subsequent consumer's brand judgement (Keller, 1993; Lassar, Mittal, & Sharma, 1995) and lead to consumer attitudes and behaviours vis-à-vis the brand (Krishnan, 1996; Van Osselaer & Janiszewski, 2001). As reviewed in Chapter 2, this process happens when a node is retrieved from the memory and activation from this node spreads to all other connected nodes. Applied to the context of CPBI, innovativeness would act as an additional node in the consumer's memory which is associated with the brand node. Innovativeness, whether it be recollected through an explicit tie (e.g., introduction of an innovation), or implicitly through other marketing activities of the brand (e.g., the design and feeling of the store), or both, could activate other brand nodes and lead to consumer affective responses.

Furthermore, and consistent with cognitive efficiency theories such as accessibility–diagnosticity theory (Feldman & Lynch, 1988; Yadav, 1994) it has been argued that the accessibility of a piece of information in consumer memory determines whether it will be used in subsequent information processing activities regarding attitude, and behaviour (Alpert & Kamins, 1995; Fazio, Powell, & William, 1989). Distinctiveness and vividness of information nodes contribute to the memory accessibility of the potential inputs to judgment and subsequent attitude formation (Anderson, 1983; Herr, Kardes, & Kim, 1991; Pham & Muthukrishnan, 2002). As the results of exploratory Studies A1-A3 indicate, innovativeness is highly related to “different”, “novelty” and “uniqueness”. Because of these factors, innovativeness could create distinctiveness

for the brand node in memory. The higher level of distinctiveness for the brand node increases its accessibility and retrieval, resulting in stronger memory traces and affective response (Dahlen, 2005; Kardes, Kalyanaram, Chandrashekar, & Dornoff, 1993; Sparkman & Locander, 1980).

Further support for the relationship between consumer perceived brand innovativeness and brand attitude are suggested by the qualitative findings of Study A2 (brand concept map study). Several respondents expressed favourable attitude and affective responses for an innovative brand. For example: *“I think that for the brand to be innovative, it has to have a good brand image, quality for money product/service and a trustworthy brand. Pentel is a brand for stationery, usually rubbers and I think also for pens. Pentel has good quality products that never fail me, to produce good stationary products that are easy to use, effective, durable and image appealing”* (Respondent 15).

“They [innovative brands] are creative and simply outstanding” (Respondent 22).

“It's not necessarily that one product/brand is better, but consumers think that they [innovative brands] are better” (Respondent 81).

“[The innovative brand] gets a group of people interested in it who will then continue to talk to others about how much they like the brand to their friends”(Respondent 87).

“Innovative brands have the 'wow' factor that sets them apart from their competitors and makes it so they can be branded as the best” (Respondent 89).

Interestingly some of the respondents also talked about the distinctiveness of an innovative brand in their minds and the mechanism of how this distinctiveness may alter their consequent information processing: *“An innovative brand is one that will stick in my mind by being different. Apple as an example dominate everything by achieving this through unique customer service, they clap when an apple product is bought, and their ability to differentiate their brand from everybody else's...”* (Respondent 16).

“I would say that what makes these brands different from others is the way they grab the customers' attention” (Respondent 85).

“It [innovative brand] differentiates itself from similar brands and makes it ‘the only and obvious choice’. Google and Facebook for example have grown exponentially. They have their own phrase, their own logo and everyone knows about” (Respondent 99).

Based on the above argument and the preliminary evidence the following hypothesis is advanced:

Hypothesis 5: Post-consumer perceived brand innovativeness positively impacts attitudes toward the brand.

3.3.3.2 The effect of post-CPBI on purchase intention

The foundation of general theories of consumer behaviour is consumer perception (e.g., Bettman, 1970; Farley & Ring, 1970; Howard & Sheth, 1969; Pappu, Quester, & Cooksey, 2007; Rubera et al., 2011). For instance, according to the Howard-Sheth model of buyer behaviour, consumer perceptions is the most important factor among many others that shape consumer purchase intention (Howard & Sheth, 1969). It has been argued that consumer perceptions could directly influence purchase intentions (Bettman, 1970). Thus, consumer perceptions about a brand's innovativeness are expected to influence purchase intention.

Furthermore, purchase intentions could also be indirectly influenced by consumer perceptions through a broad range of factors, such as motivations, attitudes, brand comprehension (Farley & Ring, 1970), and the value that a consumer places on an aspect of a brand (Bettman 1970; Farley & Ring, 1970; Howard & Sheth, 1969). Thus, the previously discussed cognitive and affective advantages for innovative brands in Hypothesis 5 should translate into consumer preference and behaviour (Fishbein & Ajzen, 1975). When a consumer more favourably evaluates a specific brand aspect such as innovativeness, the consumer is more disposed to a brand with that aspect (i.e., innovativeness), therefore increasing purchase intentions (Pappu et al., 2007; Rubera et al., 2011).

Similarly findings of exploratory and scaling studies showed that consumer perceived brand innovativeness includes perceptions of novelty, creativity, surprise and fun. Because innovativeness surprises and stimulates consumer interest (Haberland & Dacin 1992), it can excite consumers, suggesting more opportunities for new consumer-brand interactions. As a result, consumers will have pleasant feelings about the brand and derive hedonic value from this positive feeling (Kunz et al., 2011; Watson & Tellegan, 1985). Affect associated with positive feelings and favourable attitude derived from consumer-brand interactions predicts intention to purchase the brands in the future (Batra & Homer 2004; Gountas & Gountas, 2007; Howard & Sheth, 1969; Sweeney & Soutar, 2001). Hence, it is expected that consumers' perceptions of brand innovativeness would increase consumer purchase intention. Results of the brand concept map, reported in Study A2, also provide some preliminary support for this relationship. For example:

“Why are some more innovative? It's part of their marketing strategy: if your customers continue to buy even though you don't innovate, you don't really need to. Intel has to, if they [innovative brands] don't, people will stop buying” (Respondent 35).

“They [innovative brands] also are unique in the product they sell and this helps them to keep customers once they are a part of their market” (Respondent 50).

Thus, the following hypothesis is proposed:

Hypothesis 6: Post-consumer perceived brand innovativeness positively impacts consumer purchase intention.⁶

3.4 Conclusion

In this chapter, a consumer perceived brand innovativeness processing model was presented. The relationships included in the model represent the possible process that consumers may experience when they are exposed to an innovation by a brand. The model provides a theoretical framework to examine research question (3) do firms' efforts to launch product innovations lead to CPBI and if so, how does exposure to the innovation affect consumer evaluations of the brand's innovativeness? and research question (4) what are the consequences of CPBI? The conceptual model builds on the concept specialisation model (Cohen & Murphy, 1984; Hampton, 1987; Murphy, 1988), information integration theory (Anderson, 1971, 1981a) and the associative network memory model (Anderson, 1984; Anderson & Bower, 1973). The theoretical relationships in the model were also supported by the qualitative evidence derived from the brand concept map exploratory study (Study A2). The proposed CPBI model was subsequently tested in a laboratory study, which is reported in the next chapter.

⁶ Although the argument is also correct for the effect of pre-CPBI on purchase intention, this relationship is not tested in the present thesis for the following reasons: 1) The main interest is to examine the phenomenon under study (i.e., CPBI) and its effects (i.e., brand attitude and purchase intention) after introduction of the innovation rather than prior to introduction of the innovation and 2) To have a more focused and feasible model to be able to be addressed within the scope of the PhD thesis.

Chapter 4 Testing the CPBI Processing Model: Laboratory Study

4.1 Introduction

The previous chapter developed the theoretical foundation for the research program and proposed the CPBI conceptual model. A set of hypotheses to be tested in this thesis was also proposed in the previous chapter. This chapter examines the CPBI processing model in a laboratory study. This study is used to build upon insight gained in the six exploratory and scaling studies, including a conceptualisation and operationalisation of CPBI, by empirically examining consumer processing of CPBI. The study addresses research questions (3) do firms' efforts to launch product innovations lead to CPBI and if so, how does exposure to the innovation affect consumer evaluations of the brand's innovativeness? and (4) what are the consequences of CPBI?

The chapter comprised three main sections. First, it discusses the overall methodological framework of testing the proposed CPBI processing model. Second, the analysis and results of the laboratory study is detailed, including testing the known-group validity of the proposed CPBI scale. Third, the chapter ends with a detailed discussion of the overall results of testing the CPBI processing model, as well as the results of the analysis of the equivalency of the structural paths across experimental groups. By addressing some of the main limitations of CPBI measurement (Studies A1 to B3) and model (the laboratory testing), the field study reported in Chapter 5 is linked to this chapter.

A list of the CPBI processing model hypotheses (developed in the previous chapter) tested in this chapter are provided below:

- H1:** Perceived technological newness positively impacts consumer perceived product innovativeness.
- H2:** Pre-consumer perceived brand innovativeness positively impacts consumer perceived product innovativeness.
- H3:** Pre-consumer perceived brand innovativeness positively impacts post-consumer perceived brand innovativeness.
- H4:** Consumer perceived product innovativeness positively impacts post-consumer perceived brand innovativeness.
- H5:** Post-consumer perceived brand innovativeness positively impacts attitudes toward the brand.
- H6:** Post-consumer perceived brand innovativeness positively impacts consumer purchase intention.

4.2 Laboratory Study Method

Quantitative explanatory techniques were used to collect and analyse data in the laboratory study using an experimental design. Quantitative research adheres to the post-positivist principles adopted by the present thesis, because it revolves around testing and confirming hypotheses formed on the basis of existing theory (Neuman, 2011). With the post-positivist paradigm emphasis on undistorted recording of observations obtained in a rigorous manner (Denzin & Lincoln, 2012), the employment of an experimental design is the technique most aligned with the principles of this approach and offers several advantages to explore the CPBI phenomenon. Experimental studies allow for (1) isolating the experimental variables for better explanation and prediction, (2) establishing a causal relationship, and (3) controlling for internal validity (Hoyle, Harris, & Judd, 2002). These benefits are important in developing theoretical frameworks for emerging phenomena that are remained unexplored (Hoyle et al., 2002), such as CPBI. On the other hand, survey methods may offer little insight into the underlying causal mechanisms (Mitchell & Jolley, 2013) of how consumers process innovativeness at the brand level and how managers can enhance CPBI.

Last but not least, relationships between many consumer variables may develop over a meaningful period of time. As a result, a cross-sectional design may be problematic and subject to selective hypothesis testing-based biases and errors (Mitchell & Jolley, 2013). To overcome this limitation, a pretest–posttest experimental design was employed. A pretest–posttest design is the one in which, each participant is given the pretest, then the treatment is administered, and finally each participant is given the posttest (Mitchell & Jolley, 2013; p. 319). By proceeding in this way, the design effectively avoided the problem of individual differences causing differences between conditions which in turn increase the power of analysis (Singleton & Straits, 2010). Furthermore, in pretest–posttest designs some threats to internal validity, such as selection and selection by maturation interaction are automatically eliminated because of testing and retesting the same participants (Mitchell & Jolley, 2013).

4.2.1 Design and Participants

To test the proposed relationships developed in Chapter 3, a 2 (technological newness: high vs. low) × 2 (pre-CPBI: high vs. low) randomised, pretest–posttest, mixed factorial design was employed. Technological newness and pre-CPBI were the between-subjects variables, while CPBI across time was the within-subjects variable. Mixed designs maximise power by means of reducing between-subjects error variance (Mitchell & Jolley, 2013). Four different mobile phone brand names were used to (1) broaden the generalisability of results, (2) reduce the possibility of a ceiling effect and that brand-specific factors might be responsible for any observed effects (Broniarczyk &

Alba, 1994), and (3) allow for exploring the robustness of effects (Meyers-Levy, Louie, & Curren, 1994).

This design resulted in four different conditions (two experimental factors), which were implemented through eight corresponding online questionnaires (considering four brand names). Each participant was randomly assigned to one of the eight conditions. Participants in each group read a questionnaire featuring a brand introducing a new product (e.g., Samsung brand name with high level of CPBI introduced a highly technologically new product). A Diagram of the experimental design is shown in Figure 4.1.

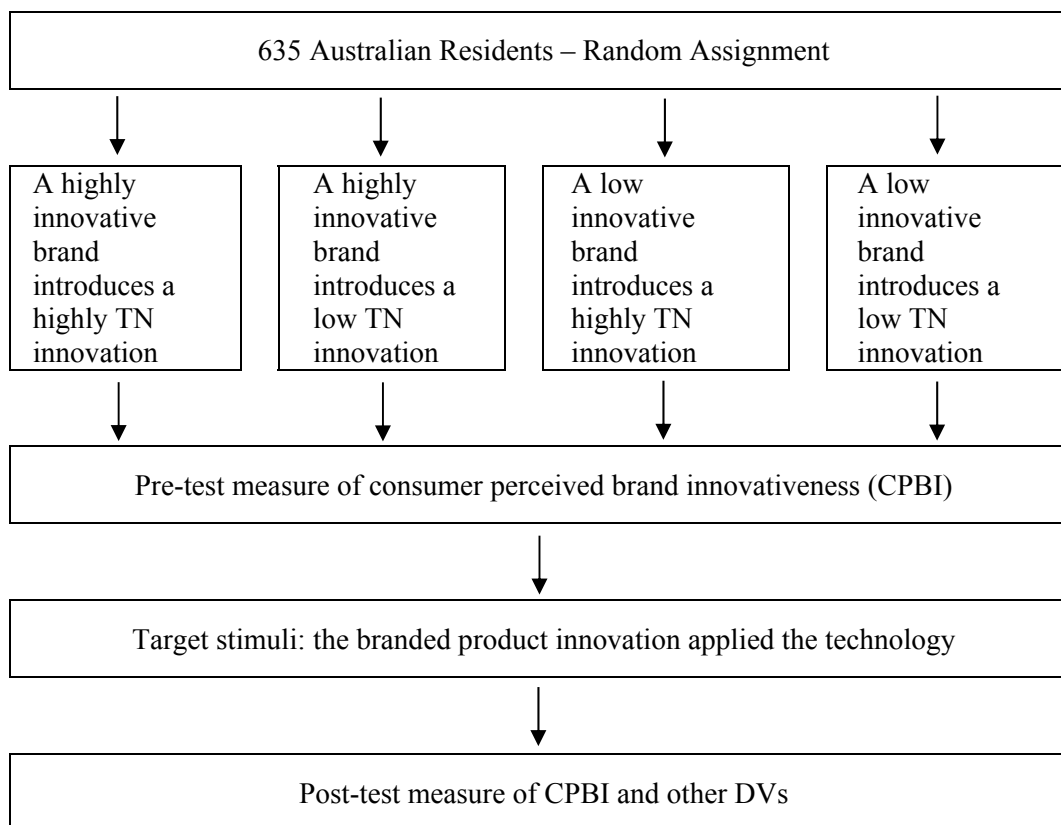


Figure 4.1 Diagram of the experimental design for the laboratory study

A total of 635 Australian consumers varying in sex and age participated in the study (see Table 4.1).

Table 4.1 Sample demographics – Laboratory study

Age [years]	Percentage	Sex	Percentage
18–24	25%	Female	57%
25–34	27%	Male	43%
35–44	22%		
45–54	15%		
55–64	12%		

The age quotas were calculated based on the proportions of age groups who own or use a mobile phone (Department of Broadband, Communications and the Digital Economy, 2008; Roy Morgan Research Single Source, 2012). Sample characteristics are detailed in the following sections (see Section 4.3.1 Sample Characteristics). The sample was generated in cooperation with a professional marketing research agency (Qualtrics). The sample size has been estimated to ensure (1) a minimum cell size of 20 observations (Hair et al., 2010) and (2) the statistical assumptions of SEM (minimum $n = 200$) are met (Bentler & Chou, 1987).

4.2.2 Selection of Stimuli

The questionnaires featured different stimuli, which were selected through multiple phases of pretesting using Australian university student samples as detailed in the following sub-sections. The principles of the information integration theory (Anderson, 1971, 1981a) have been employed in developing the stimuli. IIT declares that there are six basic options for changing a person's attitude: (1–2) Increasing the favourability and/or the weight of a piece of existing information that supports the desired attitude, (3–4) decreasing the favourability and/or the weight of a piece of existing information that opposes the desired attitude, (5) offering a new piece of favourable information and (6) reminding the audience about a forgotten piece of favourable information.

Generally, a product innovation is a piece of favourable information (Aaker, 2007; Keller & Aaker, 1992). An upcoming new product innovation is a new piece of favourable information while old product innovations can be considered as possibly forgotten piece of favourable information. Hence, the present thesis chose to focus on the last two options of “offering a new piece of favourable information” and “reminding the audience about a forgotten piece of favourable information”. The final stimuli included two mobile phone technologies (highly vs. less new) along with two product innovations featuring these technologies. The highly technologically new mobile phone offered new favourable information, while the less technologically new mobile phone reminded respondents about old favourable information. In addition, according to IIT, inconsistent information is given decreased weight. In other words, if the fit between information (in this case, mobile phone technology) and the source (in this case, the brand that introduces the technology) is low, consumers will discount the importance of the information. To avoid this outcome, the stimuli was developed such a way that neither of the two product innovations indicated a low level of fit with the selected mobile phone brand names of Apple, Samsung, Nokia and Motorola. The details are provided in the following sections.

4.2.2.1 Brand names and pre-CPBI

The results of CPBI scaling studies detailed in Chapter 2 were used to select the product category and brand names of stimuli. Four brand names of Apple, Samsung, Nokia and Motorola from the mobile phone category were selected (see Section 2.6.2 Selection of Product Category and Brand Names for justifications). Apple and Samsung exemplified high CPBI manipulation while Nokia and Motorola provided low CPBI manipulation. It was critical to use real rather than fictitious brands so that genuine brand affect and associations could be activated by the product innovation (Simonin & Ruth, 1998).

4.2.2.2 Technological newness (TN)

To select the mobile phone technologies (with two levels of high vs. low TN) and product innovations featuring these technologies two phases of pretesting were conducted, using a similar process to Reinders, Frambach, and Schoormans (2010). The ultimate goal was to select two mobile phone technologies (one highly technologically new and one less technologically new) that showed neutral design likeability and neutral or good level of product innovation – brand fit. The procedure is detailed below.

To begin, a search of several well-known websites and publications publicising new products, including new mobile phones (e.g., Consumer Electronics Association (CES), Poptadget.net, engadget.com, *PC World*, *The Economist* and *Time*) was undertaken. The purpose was to identify some potential (existing or prototype) mobile phone technologies and product innovations in the mobile phone category featuring high and low TN. The product innovations were chosen to represent innovations that were classified by the researcher as low and high TN groups, following Garcia and Calantone (2002) and the Organization for Economic Co-operation and Development [OECD] (1997). A technologically new (improved) product is a new (existing) product whose performance has been significantly enhanced (Garcia and Calantone, 2002; OECD, 1997). This type of product innovation may be a simple product that is improved using higher-performance components or materials, or a complex product that consists of a number of integrated technical sub-systems improved by partial changes to one of those subsystems (OECD, 1997).

Product innovation descriptions were adapted from the initial online sources from which the technology and the product innovation were first selected (e.g., Consumer Electronics Association (CES), Poptadget.net, engadget.com, *PC World*, *The Economist* and *Time*). Each technology and product innovation description consisted of three key pieces of information: introduction of the mobile phone technology, description of the benefits of the technology, and application of the technology in one mobile phone innovation (existing mobile phone innovation for

low TN and mobile phone prototypes for high TN). This format was consistent for both high and low TN product innovations.

This process resulted in 10 stimuli, five product innovations with low TN and five product innovations with high TN. This initial pool was then refined to include only the most appropriate stimuli using a panel of two marketing experts. Two highly technologically new product innovations stimuli were eliminated because the innovations were best fit in the “*phablet*” product category (portmanteau of the words *phone* and *tablet* - a class of mobile device designed to combine the functions of a smartphone and tablet; Wikipedia, n.d.) than the mobile phone product category. Two less technologically new product innovations stimuli were also eliminated because they were more related to the design of the mobile phone (i.e., size of the screen) than the core technology of the device. Thus, three stimuli featuring low TN and three stimuli featuring high TN and the product innovations using these technologies were retained for further analysis.

Pretest 1. This pretest was aimed at detecting mobile phone product innovations with neutral design likeability and neutral or good product innovation-brand fit. The favourability of the design of the product innovation and the product innovation-brand fit were identified control variables believed to influence the consumer perceived product innovativeness. Design of an innovation is known to affect consumer perceptions of an innovation and even the consumer diffusion of an innovation (Dell’Era & Verganti, 2010, 2011). Recent studies also found that the fit between a brand that launches a product innovation and the product innovation itself (product innovation-brand fit) has a significant effect on the evaluation of the branded product innovation (Bouten, Snelders, & Hultink, 2011). This pretest resulted in the elimination of two mobile phone product innovations as described below.

Product innovation design and product innovation-brand fit of the three highly technologically new and three less technologically new mobile phone innovations were assessed by administering a survey to a convenience sample of Australian students ($n_{\text{total}} = 150$, between subjects design, $n = 25$ for each product innovation). The questionnaire included two sections. In section one, each participant saw a product innovation photograph and were asked to rate design likeability of the product innovation on a three item, seven-point scale anchored by semantic differentials: 1 = “very unlikeable, very unpleasing and very disagreeable” and 7 = “very likeable, very pleasing and very agreeable”, $\alpha = 0.92$ (Tripp, Jensen, & Carlson, 1994). Section two included the product innovation photograph along with a short description of the product innovation technology. Participants were asked to rate the fit between a product innovation and the four brand names of Apple, Samsung, Nokia and Motorola on a one item, seven-point Likert scale: “I think [brand name] and this innovation complement each other”, (Bouten et al., 2011; source reported $\alpha = 0.95$). Results are presented in Table 4.2.

To analyse design favourability and product innovation – brand fit scores, the general guideline of performance at or above the midpoint on the scale (i.e., 4 on the seven-point scale) was used for further comparison (Desai & Keller, 2002). One-sample t-tests were performed to check that each product innovation design’s mean likeability score and each product innovation – brand fit’s score were significantly different from the scale midpoint. Results led to the elimination of one product innovation with low TN which indicated a highly favourable design ($M_{L3} = 5.32, p < 0.05$, two-tailed) and low level of fit with the brand name of Motorola in the mobile phone market ($M_{L3} = 3.28, p < 0.05$, two-tailed). Results also led to the elimination of one product innovation with high TN which indicated low level of fit with the brand name of Nokia ($M_{H3} = 3.20, p < 0.05$, two-tailed).

The remaining stimuli, including two product innovations with high TN and two product innovations with low TN, showed neutral design likability (low TN: $M_{L1} = 4.21, M_{L2} = 3.86$; high TN: $M_{H1} = 4.03, M_{H2} = 4.21, p > 0.05$, two-tailed). Results are presented in Table 4.2. These four product innovations also did not show a low level of product innovation – brand fit (*low TN*: $M_{L1-Apple} = 3.16, p > 0.05$; $M_{L1-Samsung} = 5.32, p < 0.05$; $M_{L1-Nokia} = 4, p > 0.05$; $M_{L1-Motorola} = 4.28, p > 0.05$; $M_{L2-Apple} = 3.75, p > 0.05$; $M_{L2-Samsung} = 5.08, p < 0.05$; $M_{L2-Nokia} = 5, p < 0.05$; $M_{L2-Motorola} = 4.33, p > 0.05$, all two-tailed; *high TN*: $M_{H1-Apple} = 5.52, p < 0.05$; $M_{H1-Samsung} = 5.48, p < 0.05$; $M_{H1-Nokia} = 3.52, p < 0.05$; $M_{H1-Motorola} = 3.36, p < 0.05$; $M_{H2-Apple} = 4, p > 0.05$; $M_{H2-Samsung} = 5.04, p < 0.05$; $M_{H2-Nokia} = 4.15, p > 0.05$; $M_{H2-Motorola} = 3.81, p > 0.05$, all two-tailed) and were therefore retained for further analysis.

Pretest 2. Finally, the TN of the remaining four product innovations was assessed using another convenience sample of Australian students. Specifically, 65 participants were randomly assigned to two versions of questionnaire. Thirty-five students rated the TN of two product innovations featuring low levels of technological newness, while 30 students rated the TN of two product innovations featuring high levels of technological newness. Participants saw product innovations and their descriptions. Technological newness was measured using a seven-point three-item scale adapted from Chang (2007) and Moreau, Lehman, and Markman (2001), $\alpha = 0.92$. Items included: “How new is this mobile phone’s technology?” “The technological characteristics of this mobile phone are highly different from other mobile phones” and “this mobile phone’s technology is new”. Scores on the items were averaged.

Table 4.2 Stimuli selection

Mobile phone innovations	Pretest 1			Pretest 2	
	Design likability	Product innovation – brand fit	Result	Technological Newness	Result
L1 (stimulus 1 describing a less technologically new mobile phone): Hi-silicon processors	4.21 <i>ns</i>	Apple: 3.16 <i>ns</i> Samsung: 5.32* Nokia: 4 <i>ns</i> Motorola: 4.28 <i>ns</i>	Qualified for Pretest 2	4.07 <i>ns</i>	Eliminated because it was perceived as a neutrally technologically new mobile phone.
L2 (stimulus 2 describing a less technologically new mobile phone): Pixel oversampling technology	3.86 <i>ns</i>	Apple: 3.75 <i>ns</i> Samsung: 5.08* Nokia: 5* Motorola: 4.33 <i>ns</i>	Qualified for Pretest 2	3.52*	<i>Final stimulus:</i> Perceived as not a highly technologically new mobile phone.
L3 (stimulus 3 describing a less technologically new mobile phone): Gorilla glass screen	5.32*	Apple: 4.24 <i>ns</i> Samsung: 5.52* Nokia: 4.16 <i>ns</i> Motorola: 3.28 *	Eliminated due to the highly perceived favourable design and a low level of fit with the Motorola brand in the mobile phone market	–	–
H1 (stimulus 1 describing a highly technologically new mobile phone): E-motions communication technology	4.03 <i>ns</i>	Apple: 5.52* Samsung: 5.48* Nokia: 3.52 <i>ns</i> Motorola: 3.36 <i>ns</i>	Qualified for Pretest 2	6.14	<i>Final stimulus:</i> It was statistically perceived as more technologically new than the stimulus H2.
H2 (stimulus 2 describing a highly technologically new mobile phone): Pen-sized mobile phone	4.21 <i>ns</i>	Apple: 4 <i>ns</i> Samsung: 5.04* Nokia: 4.15 <i>ns</i> Motorola: 3.81 <i>ns</i>	Qualified for Pretest 2	5.69	Eliminated because it was statistically perceived as less technologically new than the stimulus H1.
H3 (stimulus 3 describing a highly technologically new mobile phone): Swing-arms mobile phone	3.73 <i>ns</i>	Apple: 4.48 <i>ns</i> Samsung: 5.08* Nokia: 3.20* Motorola: 3.60 <i>ns</i>	Eliminated due to a low level of fit with the Nokia brand in the mobile phone market	–	–

Notes: * $p < 0.05$ (two-tailed; test value = 4); *ns* = not significant.

Results for low TN revealed that one stimuli (out of two with low TN manipulations) was perceived as a product innovation with low level of TN ($M_{L2} = 3.52$, $p < 0.05$, two-tailed). Thus stimulus L2 was included in the final instrument. However, both high TN stimuli were perceived as highly technologically new ($M_{H1} = 6.14$, $M_{H2} = 5.69$, $p < 0.05$, two-tailed). Therefore, another one-

sample t-test was conducted to test for the equality of the mean scores. Stimulus H1 ($M_{H1} = 6.14$) was statistically perceived as more technologically new than stimulus H2 ($p < 0.05$ two-tailed) and used in the final instrument. These two final stimuli are presented below.

Description 1 in the mobile phone market: Low level of technological newness

Pixel oversampling technology was first revealed as an advanced picture management process for mobile phones at the Barcelona World Mobile Congress 8 years ago, in 2006. Although the technology dated from the 1990s when it was first used in digital cameras, it was not available in the mobile phone market until 2006.

This technology reduces an image taken at full resolution into a lower resolution picture by a process of combining many pixels into one perfect pixel, thus achieving higher definition and light sensitivity, and enables loss-less zoom.

Since 2006, the technology has been widely used and modified by mobile phone manufacturers throughout the world. For example the image below displays a mobile phone with an improved pixel oversampling camera that was introduced by a manufacturer 4 years ago, in 2010. Thanks to its improved pixel oversampling camera the user can catch all the action on film - as it happens. This mobile phone's camera is among good resolution sensors in the mobile phone market. Similar to most other mobile phones, the phone comes with 3G, memory of 16 or 32 GB and a 1.3 GHz CPU.



Description 2 in the mobile phone market: High level of technological newness

E-motions technology was first revealed as an advanced communication offering for mobile phones at the Barcelona World Mobile Congress in early 2014. This cutting edge technology was not available in the mobile phone market until a few months ago.

E-motions technology allows you to send shape creations to other users. For instance, you can send a heart shape to your girlfriend and her phone will form into a heart! It is like messaging but without words.

Very few mobile phone manufacturers throughout the world have successfully started implementing E-motions technology. For example the image below displays one of the smart phone projects of a mobile company whose goal is to create a device for 2020 that is both innovative and revolutionary. This E-motions-enabled smart phone was first seen in concept form early this year. The company has announced that an actual product will be unveiled in 2017.

It is made of a high-tech rubbery, shape-memorising material that allows it to adjust and twist into a vast array of shapes. Thanks to E-motions technology its advanced touch sensitive body cover can be programmed to change form in a variety of situations. For example, when you want to talk on the phone, the body can assume the form of a standard mobile phone at the touch of a button. If you want an alarm, again just press a button and it will take on a shape that sits like a clock on your bedside table. Interestingly, you can personalise these forms and record them.



In summary, four brand names (two with high and two with low pre-CPBI) were combined with two product innovations to represent high pre-CPBI and high TN, high pre-CPBI and low TN, low pre-CPBI and high TN and low pre-CPBI and low TN (see Table 4.3).

Table 4.3 Final stimuli

PC : Mobile phone s		<i>Technological newness of the product innovation</i>	
		High	Low
<i>Pre-CPBI</i>	High	Samsung (Apple) introducing a highly technologically new innovation	Samsung (Apple) introducing a less technologically new innovation
	Low	Nokia (Motorola) introducing a highly technologically new innovation	Nokia (Motorola) introducing a less technologically new innovation

4.2.3 Data Collection Procedure and Instrumentation

Participants were randomly assigned to one of the eight versions of an online questionnaire using Qualtrics online consumer panel facilities. Using computerised instructions eliminated the role of researcher and effectively circumvented the problems associated with experimenter biases such as experimenter expectancies, which are considered threats to construct validity (Cook & Campbell, 1979). Each questionnaire contained seven sections (see Appendix C for the sample questionnaire) and each section appeared on a separate page. A schematic representation of the instrumentation is shown in Figure 4.2. The procedure was carefully adapted from similar previous pretest–posttest designs in the literature (e.g., Simonin & Ruth, 1998). In brief, filler items, sections one, two, four and seven of the questionnaire were constant across conditions. The third section measured pre-CPBI for the target brand (Apple, Samsung, Nokia and Motorola) and varied across conditions. The fifth section included information about the target mobile phone technology and

one product innovation that applied the technology and varied across conditions. The sixth section included information about the introduction of the product innovation (using the target technology) by the target brand and again varied across conditions⁷.

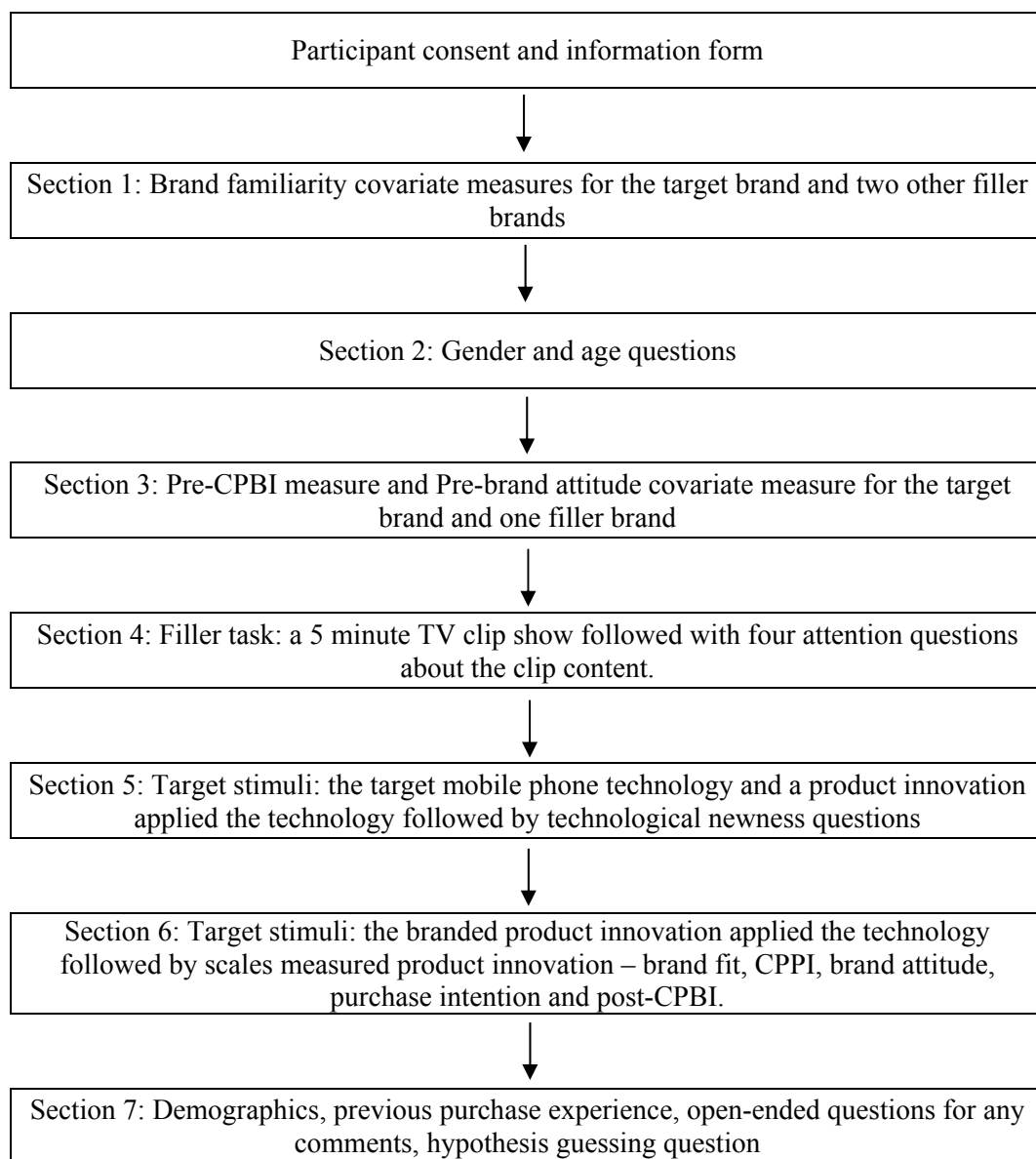


Figure 4.2 Summary of design and procedure for the laboratory study

First, respondents read online materials containing general instructions and a brief cover story explaining that the research was aimed at exploring their perceptions of different brands and products. In section one, participants were required to rate three scale items assessing brand familiarity with the target and two other filler brands in the skin care and automobile categories.

⁷ To ensure the readability, understandability and logical structure of the survey questionnaire, the questionnaire was first pilot tested on 20 students at UQ Business School. Results supported readability of the questionnaire as all questions were attempted by the respondents with no missing data. In addition, respondents were interviewed about the clarity of the structure and overall understandability of the instrument. Based on the results it was concluded that no question functioned oddly and the structure of the survey questionnaire was perceived clearly.

Higher levels of familiarity lead to more associations a consumer tends to have for the familiar brand compared with less familiar counter-parts. According to attitude theory (Fazio et al., 1989) familiar brands produce stronger attitudes due to the extensive associations consumers have with them in their memories, making them more stable and less likely to change as new information is received (Anderson, 1981). Hence, brand familiarity was included as a covariate in the model to control for distortive effects of prior experience and knowledge on consumer response. Furthermore, inclusion of other brand names (filler brands) reduced reactivity in the form of hypothesis guessing by limiting participants' ability to distinguish among brands (Mitchell & Jolley, 2013).

Section two consisted of age and gender quotas requested by the researcher (see also section 4.2.1 Design and Participants). To ease the process of screening out those respondents who did not meet the quota requirements, these two demographic questions moved to the beginning of the questionnaire. Next, participants were required to rate the CPBI of the target brand prior launching the innovation (pre-CPBI) and the CPBI of a filler brand in the automobile category. This section also included a prior brand attitude scale, measured as a proxy for participants' involvement that potentially could affect their evaluations of the product innovation and the parent brand (Celci & Olson, 1988; Gardner, Mitchell, & Russo, 1985). Previous research has suggested that high involvement with a particular product category may influence the manner in which consumers evaluate product innovations (Goldsmith & Hofacker, 1991; Vandecasteele & Geuens 2010). Prior brand attitude was also treated as a covariate in the model.

In section four, a 5-minute distraction task was administered. Participants watched an episode of Top Gear which contained information irrelevant to the purpose of the present study. The purpose of the distraction task was to clear short-term memory between the first (before product innovation announcement) and second (after product innovation announcement) measurement of CPBI (Gürhan-Canli & Maheswaran, 1998). The choice of such distraction tasks is modelled on prior research in marketing and consumer behaviour (e.g., Braun-LaTour & LaTour, 2005; Ruth & Simonin, 2003).

This particular video was selected because: (1) the TV show clip was neither related to the study context nor it showed any specific mobile phone brand name or new mobile phone technology. Thus, this distraction task found useful to further disguise the goals of the study; (2) while the selected clip was light-hearted, it was not overly hilarious. Hence, while effectively preventing the introduction of a confounding factor, it would not excessively affect the respondents' mood. It also prevented deliberate elaboration of the information processed in the first CPBI exposure; (3) both the Top Gear TV show clip and the selected filler brand in section three were in the automobile category, thereby minimising the risk of hypothesis guessing; (4) this funny episode

made the experiment interesting and undemanding, which in turn reduced the participants' fatigue effects (Hair et al., 2010; Mitchell & Jolley, 2013); and (5) Because this entertainment production is available universally, it is readily understood by the participants; which again reduced participants' mental effort⁸.

To ensure that all participants actually watched the clip two strategies were applied. First, on a separate page prior to the TV show page, respondents were informed that after watching the video clip they should reply to a few questions about the content of the video clip. Three very simple and basic questions were developed. Respondents who provided incorrect answers were automatically thanked and screened out of the study⁹. Second, a *timing* question was assigned to this section such that respondents were allocated 5 minutes and 10 seconds to stay on this page and watch the clip. After the time gap, respondents were automatically forwarded to the next page.

Next in section five, participants were provided with the target mobile phone technology and a mobile phone product innovation which used the technology. No brand name was attached to this section. Section five also included manipulation check questions for technological newness of the product innovation. Once again, to prevent hypothesis guessing, respondents were informed that they would be asked to read and think about one technology and one new product (randomly assigned) that used this technology in either mobile phone or automobile categories. In fact, they were only presented with the target mobile phone technology.

Section six consisted of two pages. In the first page, respondents were informed that “Interestingly, the manufacturer that introduced the above new mobile phone was [the target brand].” Then, they were asked to assess product innovation – brand fit and consumer perceived product innovativeness (CPPI). In the next page, scales measuring brand attitude, purchase intention and post-CPBI were included.

It is important to note that a meaningful amount of time elapsed between evaluation of the CPBI at the pretest stage and the final posttest of CPBI (approximately 30 minutes), because respondents viewed additional unrelated filler material in the interim¹⁰. This procedure effectively treated the testing effect which is a common threat to the internal validity of pretest–posttest designs (Singleton & Straits, 2010). Specifically, by allowing sufficient time between pretest and posttest, the researcher provided an opportunity for the pretest effects wear off, thus minimising practice effects and hypothesis guessing (Mitchell & Jolley, 2013). Furthermore, in both pretest and posttest, participants were measured with the same CPBI scale, in the same way (i.e., high level of

⁸ The responses to the open-ended question indicated that in general both male and female respondents found the TV show video clip funny and entertaining.

⁹ The dropout rate of those who answered questions about the film incorrectly was around 6%.

¹⁰ Post-hoc analysis of the responses to the open-ended question at the end of the survey indicated that only one respondent ($n = 635$) commented “too long” for the survey. However, the majority of the respondents found the survey “interesting”, “fun”, “great” and “nice”. Thus, respondent fatigue was not found problematic.

standardisation) which in turn effectively eliminates the instrumentation threat of internal validity and increases the manipulation validity (Cook & Campbell, 1979).

Finally section seven asked for some demographics, participants' previous mobile phone brand purchase experience, participants' current mobile phone brand and one open-ended question for any comments from respondents, followed by one hypothesis guessing question in the next page: "What do you think was the purpose of this study?" Participants then saw the "Thank You" page which includes one sentence informing respondents that the products they saw in the questionnaire were not actual products. See Appendix C and E for the sample questionnaire and scale items.

4.2.3.1 Detecting satisficing respondents

Researchers often must deal with participants who are not as diligent as the researcher would like them to be. Some participants may give flippant answers or skim instructions, missing key elements of the task or manipulation. These participants who are known as satisficing respondents (Krosnick, 1991) increase noise and reduce experimental power. Participants who are satisficing often do not bother to read the questions or instructions in a survey, respond in a haphazard fashion and in extreme cases, answer randomly (Oppenheimer, Meyvis, & Davidenko, 2009). To detect satisficers a new methodological tool: the Instructional Manipulation Check (IMC) has been recently developed by Oppenheimer et al. (2009).

The IMC examines whether or not participants are reading the instructions. It consists of questions embedded within the experimental materials that are similar to the other questions in length and response format (e.g., Likert scale, check boxes, etc.). However, unlike the other questions, the IMC asks participants to ignore the standard response format and instead provide a confirmation that they have read the instruction. The IMC technique was incorporated to detect and account for satisficers, thereby ensuring the quality of the data and experimental power. Following Oppenheimer et al. (2009) five IMC questions were developed and placed in different sections of the questionnaire¹¹. These simple and unrelated questions were aimed at identifying satisficing respondents who did not actually read the materials and tried to complete the questionnaire by randomly clicking scale points. Respondents who failed to fill out IMC questions correctly were automatically screened out of the study (see Appendix C for the sample questionnaire). This technique has been successfully used in previous studies in innovativeness literature (e.g., Vandecasteele & Geuens, 2010). An example of IMC items used is:

¹¹ IMC items were also included in the questionnaire pilot test. Results supported their clarity and understandability.

Please select the second scale point from the left to continue.

Please select the scale point as directed above	Strongly disagree 1	Moderately disagree 2	Slightly disagree 3	Neither 4	Slightly agree 5	Moderately agree 6	Strongly agree 7
-------------------------------------------------	---------------------	-----------------------	---------------------	-----------	------------------	--------------------	------------------

4.2.4 Measures and Measurement

Established scales, validated in past research, have been adapted or adopted, and are summarised here. Measurement scales used in this study demonstrated high level of reliability and validity (see Section 4.3.7 Reliability and Validity). Pre-CPBI and post-CPBI were measured on the seven-point Likert scale where “1 = strongly disagree” and “7 = strongly agree”, developed in Chapter 2. CPPI was measured using a six-item seven-point semantic differential scale developed by Sethi et al., (2001). The brand attitude construct was operationalised as the overall predisposition towards the brand, following previous studies (e.g., Ruth & Simonin, 2006). It was measured using a four-item semantic differential scale of Holbrook and Batra (1987). Purchase intention was measured using a four-item seven-point Likert scale based on Dodds, Monroe and Grewal (1991). Technological newness questions included a three-item seven-point Likert scale adapted from Garcia and Calantone (2002) and Olshavsky and Spreng (1996).

Brand familiarity and product innovation – brand fit were the covariates included based on the justifications provided in previous sections (see Sections 4.2.2.2 Technological newness (TN) and 4.2.3 Data Collection Procedure and Instrumentation). The measure for brand familiarity included three items, measured on a seven-point semantic differential scale adopted from Simonin and Ruth (1998). Product innovation – brand fit was measured using a three-item, seven-point Likert scale adopted from Bouten et al. (2011). The prior brand attitude measure (employed as proxy for the involvement covariate) was similar to the brand attitude scale discussed above. See Appendix C for the sample questionnaire and scale items. Appendix E also includes a glossary of the measures used in this thesis.

4.2.5 Model Estimation and Evaluation

Researchers in the behavioural sciences tend to use one of the three statistical analyses to test pretest-posttest designs; namely repeated measures analysis of variance (ANOVA), ANOVA on the gain scores (posttest scores minus pretest scores), and analysis of covariance (ANCOVA) (Huck & McLean, 1975; Jennings, 1988). Having random assignment to treatment groups, analysis of covariance structures (ANCOVA or MANCOVA) is statistically more powerful than repeated measures ANOVA/MANOVA or gain score analysis (Grimm & Yarnold, 2000). By taking in to account the measurement error, structural equation modelling (SEM) provides one of the strongest methods of analysing covariance structures (Bentler, 2010). Hence, this thesis utilised SEM to

analyse the pretest–posttest data. Anderson and Gerbing’s (1988) two step approach was used to estimate the CPBI processing model. First, the measurement models for key theoretical constructs were estimated followed by a discussion of the results of the overall structural model and the research hypotheses. AMOS 21 was used for estimation of both the measurement and the structural models.

Theoretical considerations as well as model fit indices guided the analysis of the data and the evaluation of the model fit. Similar to the model fit assessment reviewed in Chapter 2, fit indices and cut-off values included were Chi-square (χ^2 , $p > 0.05$), root mean square error of approximation (RMSEA ≤ 0.08), standardised root mean-square (SRMS ≤ 0.08), Tucker-Lewis index (TLI ≥ 0.95) and comparative fit index (CFI ≥ 0.95). Factor loadings (λ) above 0.5, squared multiple correlations $\lambda^2 \geq 0.50$ and absolute standardised residual covariance values less than 2.58 were deemed as acceptable. Regarding standardised regression weights (β), effects less than 0.2 are considered as weak, between 0.2-0.3 are mild, between 0.3-0.5 are moderately strong, between 0.5-0.8 are interpreted as strong and more than 0.8 are extremely strong (Hair et al., 2010).

Multiple Group Analysis (MGA) tests a hypothesised model across groups (Byrne, 2010; Little, 1997). As detailed in the design section, a 2 by 2 factorial design which resulted in four treatment groups was used. Hence, Multiple Group Analysis (MGA) was utilised to examine the proposed hypotheses developed in Chapter 3 across the four experimental groups. Following procedures prescribed by Byrne (2010), a series of hierarchical steps including determination of the baseline model, the configural model and the MG model was conducted. The method and the actual analysis can best be discussed together. Thus, this approach is discussed in detail in Section 4.3.8 The Structural Model. Next, to further analyse the equivalency of the structural paths across highly and low innovative brands as well as high and low technological newness, a series of tests that constitutes invariance testing through MGA was conducted.

There are many possible sequences of the invariance tests through MGA which are covered at length elsewhere (Byrne, Shavelson, & Muthén, 1989; Cheung & Rensvold, 2000; Jöreskog & Sörbom, 1993) and are beyond the scope of this thesis. Procedures prescribed by Byrne (2010) are followed in this thesis. Byrne (2010) is among the best-selling SEM books and serves well as a companion book to the AMOS user’s guide (Arbuckle, 2012). It is suggested that initially, the pattern of factor loadings for each observed measure should be tested for its equivalence across the groups (Byrne, 2010; Cheung & Rensvold, 2000; Jöreskog & Sörbom, 1993). Once it is known which measures are group-invariant, these parameters would be constrained equal while subsequent tests of the structural parameters are conducted. As each new set of parameters are tested, those known to be group-invariant would be cumulatively constrained equal.

Measurement equivalence testing exemplifies a construct validity focus (Byrne, 2010; Jöreskog & Sörbom, 1993) and addresses questions such as “do the items comprising a factor operate equivalently across different groups” (Byrne, 2010). However, the laboratory model testing study is aimed at addressing different research questions (research questions 3 and 4) with the main focus on structural path estimates. Hence, the equivalency of the structural paths was examined while assuming the measurement model to operate equivalently across groups. The process includes testing the invariance of estimated parameters of two nested models across groups. The chi-square difference test exhibiting a probability < 0.05 (Bollen, 1989; Byrne, 2010; Jöreskog & Sörbom, 1993) was employed to test for nested model fits¹².

4.3 Laboratory Study Analysis and Results

The previous sections detailed the method. In the following sections the analysis of the data collected to test the proposed CPBI model is reported. First, the description of the sample is presented. Next, the preliminary analysis of the data including the examination and treatment of missing data, outliers detection and treatment and the assumption check for SEM is reported. After careful preliminary examination of the data, results of the two-stage model estimation using structural equation modelling are presented. The examination reports the estimation of the measurement models for each of the theoretical constructs, followed by the multiple group confirmatory factor analysis of the structural model.

4.3.1 Sample Characteristics

Six hundred and thirty five Australian residents varying in sex and age were assigned to one of four mobile phone brand conditions (Apple: $n = 160$, $M_{\text{age}} = 37$ [years], 67% female; Samsung: $n = 160$, $M_{\text{age}} = 37$, 60% female; Nokia: $n = 160$, $M_{\text{age}} = 37$, 51% female; and Motorola: $n = 155$, $M_{\text{age}} = 36$, 48% female)¹³. For each brand half of the participants were presented with the less technologically new stimuli and the other half with the highly technologically new stimuli. The majority of participants indicated “some college” as their highest level of education (27 per cent), followed by 26% “four year college degree”, 24% “high school”, 11% “two year college degree”,

¹² It has been argued that from a practical perspective, the χ^2 difference test represents an excessively stringent test of invariance and particularly in light of the fact that SEM models at best are only approximations of reality (Cudeck & Browne, 1983; MacCallum, Roznowski, & Necowitz, 1992). Consistent with this perspective, Cheung and Rensvold (2002) reasoned that it may be more reasonable to base invariance decisions on a difference in CFI (Δ CFI, exhibiting a probability < 0.01) rather than on χ^2 values. Although this more recent approach to testing for invariance is increasingly reported in the literature, it has not been granted the official SEM stamp of approval to date (Byrne, 2010; Kline, 2011). Thus in the present thesis, only the chi-square difference test is reported to test for nested model fit.

¹³ Although Qualtrics was provided with a 2.5 month time period for collecting the data, they could not meet the deadline and I lost 5 completes for Motorola.

8% “Master’s degree”, 2% “less than high school”, 1% “doctoral degree” and 1% “professional degree”.

4.3.2 Preliminary Analysis of the Data

4.3.2.1 Missing data

Missing data can pose problems in multivariate data analysis if they exceed more than 10 percent (Hair et al., 2010, Nunnally & Bernstein 1994). No missing values were detected in the data collected for the laboratory study as respondents were compelled to complete all items, an advantage of online questionnaires. Because respondents were recruited from a panel where they are remunerated to participate, there were minimal problems with obtaining willing respondents. It was made very clear to respondents how long the task would take. Non-completion of the survey was avoided as participants were unable to proceed until they responded to each item.

4.3.2.2 Outliers and hypothesis guessing results

Outliers are scores that are markedly different from the rest. A case can have a univariate outlier if it is extreme on a single variable. There is no single definition of “extreme,” but a common rule is that scores more than three standard deviations beyond the mean may be outliers (Kline, 2011). The frequency distributions of z scores (e.g., $|z| > 3.00$ indicates an outlier) were examined to identify univariate outliers. The results identified nine univariate outliers in the data set. Upon examination it was concluded that two out of nine cases may well represent a valid element of the population. The other seven observations were removed from the data set, resulting in $n = 628$.

A multivariate outlier has extreme scores on two or more variables, or its pattern of scores is atypical (Hair et al., 2010). Multivariate outliers were detected using Mahalanobis D^2 statistic, which indicates the distance in standard deviation units between a set of scores (vector) for an individual case and the sample means for all variables (centroid), correcting for inter-correlations (Kline, 2011). Twelve multivariate outliers were detected (χ^2 [$df = \text{number of variables}$], $p < 0.001$), which were examined carefully. Upon examination it was concluded that three out of 12 cases were not extraordinary in nature and may well represent a valid element of the population. The other nine observations were removed from the data set. In total 619 observations remained for the further analysis.

Furthermore, the responses to the last question (what do you think was the purpose of this study?) indicated that four respondents could guess the purpose of the study, two of which were among the outliers and had been removed previously. The other two cases were eliminated and were not included in the analysis. In total 617 observations remained for analysis.

4.3.3 Assumptions of SEM

4.3.3.1 Normality

Estimation in SEM with ML assumes multivariate normality or multinormality of continuous outcome variables. This means that: (1) all the individual univariate distributions are normal; (2) all bivariate scatterplots are linear, and (3) the distribution of residuals is homoscedastic (Kline, 2011). Normal Q-Q plots provided a visual test for the assumption of univariate normality for each variable. No severe univariate non-normality was detected visually. In addition, the calculated skewness and kurtosis values were all ≤ 1 and within the acceptable range of $|S/K| < 3$ (Kline, 2011; Hair et al., 2010). However, the *z*-statistic for skewness and kurtosis indicated that the data distribution was non-normal ($|z| > 2.58$ at 0.01 significance level, c.f. Hair et al., 2010). The majority of the observed indicators were sat on the right side of the scale (≥ 4) and the distribution of the data were mainly negatively skewed. This was not surprising considering that the phenomenon under study (innovativeness) is a positively perceived concept (Kunz et al., 2011). A few observed indicators were also platykurtic. Further, to test multivariate normality, Mardia's coefficient (>1.96) was calculated in AMOS 21. Results indicated that the data were non-normal. Hence, to adjust for distributional misspecification of the model, the "Bollen-Stine" bootstrap *p* incorporating 500 resamples (Arbuckle, 2012) was used and is reported for the measurement and structural models.

4.3.3.2 Linearity, homoscedasticity and multicollinearity

The visual examination of bivariate scatter plots confirmed the linear association between the variables in the dataset. However, scatterplots of selected variables were chosen for examination [i.e., 'spot check' by Tabachnick and Fidell (2007)], as it was not practical to check scatterplots of all variables in combination with all other variables. Homoscedasticity is the assumption that the variances of the residuals are approximately equal for all predicted DV scores (Hair et al., 2010). Visual examination of the scatter plots of data points for each variable indicated no unequal dispersion of variances. The data were checked for multicollinearity by examining the correlation matrices of the independent variables. All correlation values were below the recommended threshold of 0.90 (Bagozzi, 1994). Thus, multicollinearity did not appear to be a potential problem.

4.3.3.3 Sample size

As an *ad hoc* rule of thumb, a ratio of 10 subjects for each parameter being estimated is considered sufficient to estimate parameters confidently with adequate statistical power. However, such an *ad hoc* rule is inappropriate for structural equation models with latent variables because the

statistical theory underlying parameter estimation is asymptotic in nature (Byrne, 2010; Kline, 2011). This means that statistics such as the standard errors for parameter estimates can only be given confidently as the total number of cases approaches infinity. Therefore, while using very large sample sizes to estimate parameters in structural equation models with latent variables will lead to a degree of confidence about such statistics, the asymptotic statistical theory gives no clue as to just how large a “large” sample needs to be (Byrne, 2010; Kline, 2011). In the absence of such statistical theory, researchers have turned to Monte Carlo studies to examine the effect of sample size on the stability of parameter estimates. Based on Monte Carlo studies researchers have concluded that Maximum Likelihood (ML) estimators in structural equation models with latent variables collapse badly in samples of less than 100 (Boomsma, 1983; Boomsma & Hoogland, 2001). Boomsma suggested that, as a general rule across a number of model types, samples of 200 are required to give parameter estimates with any degree of confidence. The sample sizes used in the laboratory study ($n = 617$) and MGA 1 (highly innovative brands: $n_1 = 312$, low innovative brands: $n_2 = 305$) and MGA 2 (highly technologically new products: $n_1 = 324$, technologically new products: $n_2 = 293$) were above the threshold of 200 and were adequate for the analyses (Hoelter, 1983).

4.3.4 Manipulation Checks

Significant differences were observed in the technological newness levels of the product innovations used in the study as indicated by the results of a one-way ANOVA ($F [1, 616] = 741.587, p < 0.01$). As expected, the high technological newness (E-motions technology) was considered more technologically new ($M = 6.26$) than the low technological newness (Pixel oversampling technology) ($M = 3.88$). It can, therefore, be concluded that technological newness was adequately manipulated in the present experiment. Furthermore, significant differences were observed in the pre-CPBI levels of the brands used in the study as indicated by the results of a one-way ANOVA ($F [1, 616] = 318.863, p < 0.01$). As expected, innovative brands ($n = 312, M = 5.83$) were more perceived highly innovative in comparison to the less innovative brands ($n = 305, M = 4.24$). Apple iPhones ($n = 157, M = 6.07$) and Samsung mobile phones ($n = 155, M = 5.58$) were more innovative compared to Nokia mobile phones ($n = 155, M = 4.44$) and Motorola mobile phones ($n = 150, M = 4.04$). Hence, it can be concluded that pre-CPBI was adequately manipulated in the present experiment.

A third ANOVA was conducted with type of technological newness (high TN vs. low TN) and type of pre-CPBI (highly innovative brands vs. low innovative brands) as the independent variables and product innovation – brand fit as the dependent variable. As expected fit did not vary significantly by the type of technological newness ($F [1, 616] = 1.870, p > 0.05$), with the highly

technologically new product innovation ($M = 4.98$) and the less technologically new product innovation ($M = 5.13$) being considered congruent with the brand. Product innovation – brand fit also did not vary significantly by the type of pre-CPBI ($F [1, 616] = 1.406, p > 0.05$). The product innovations were considered congruent for highly innovative brands ($M = 5.11$) and for low innovative brands ($M = 4.98$).

4.3.5 Common Method Variance Bias

Suggestions outlined in Podsakoff et al. (2003) were followed to minimise any potential threat to validity. For example, the information form and introductory pages assured respondents that the items had no right or wrong answers, that their responses would be anonymous, and that the analysis would be free of any identifying information. Also measures of the constructs used different response formats (e.g., semantic differential scales for CPPI and Likert scales for CPBI). A test for common method variance bias was conducted using Harmon's one factor test, as recommended by Podsakoff and Organ (1986). The results indicated that common method variance did not pose a problem. Using all of the items of all the latent variables, a single factor model was tested using CFA procedures. This model displayed very poor fit to the data ($\chi^2 [665] = 14256.559, p < 0.001$; CFI = 0.585; TLI = 0.561; RMSEA = 0.182; SRMR = 0.126), indicating that there is no general factor that accounts for the majority of covariance across these variables.

4.3.6 The Measurement Model

Measures for the key constructs included in the models are assumed to be reflective in nature consistent with previous research in the consumer perceived innovativeness literature (e.g., Henard and Dacin, 2010; Rubera et al., 2011). Measurement models were subject to CFA to ensure acceptable levels of fit prior to examining the structural model. The pre- and post-CPBI constructs were measured using the ten-item scale developed and validated in Chapter 2. As discussed in Chapter 2, the scale indicated adequate fit using an Australian student sample. However, to provide additional evidence for the scale reliability and validity among non-students, the measurement model, composite reliability and average variance explained for the CPBI construct are also reported in the following pages along with the measurement models for the other four measured constructs: consumer perceived product innovativeness (CPPI), technological newness (TN), brand attitude and purchase intention. The reported p (s) is the “Bollen-Stine” bootstrap p incorporating 500 resamples (Arbuckle, 2012)¹⁴.

¹⁴ In addition to the Bollen-Stine bootstrap modification of model chi-square, corrected standard errors were also calculated using 500 bootstraps. Since the estimated biases (the difference between the average of β estimates obtained from β bootstrap samples, and the single estimate obtained from the original sample) were smaller in magnitude than

4.3.6.1 Consumer perceived brand innovativeness (CPBI)

The CFA results for the consumer perceived brand innovativeness measurement model are depicted in Figure 4.3. Two numbers are printed on each arrow. Left side numbers are factor loadings and right side numbers (close to the end of each arrow) are squared multiple correlations or item reliability. This is consistent in all of the following figures. Post-CPBI values were used for the following CFA calculation. Pre-CPBI values were also examined and results were very similar to post-CPBI. As the figure shows, the overall fit statistics of the CFA model were satisfactory. All factor loadings were positive (0.79–0.93) and highly significant ($p < 0.001$). Squared multiple correlations for each item were also well above the recommended benchmark of 0.50 (Fornell & Larcker, 1981), ranging from 0.63 to 0.87.

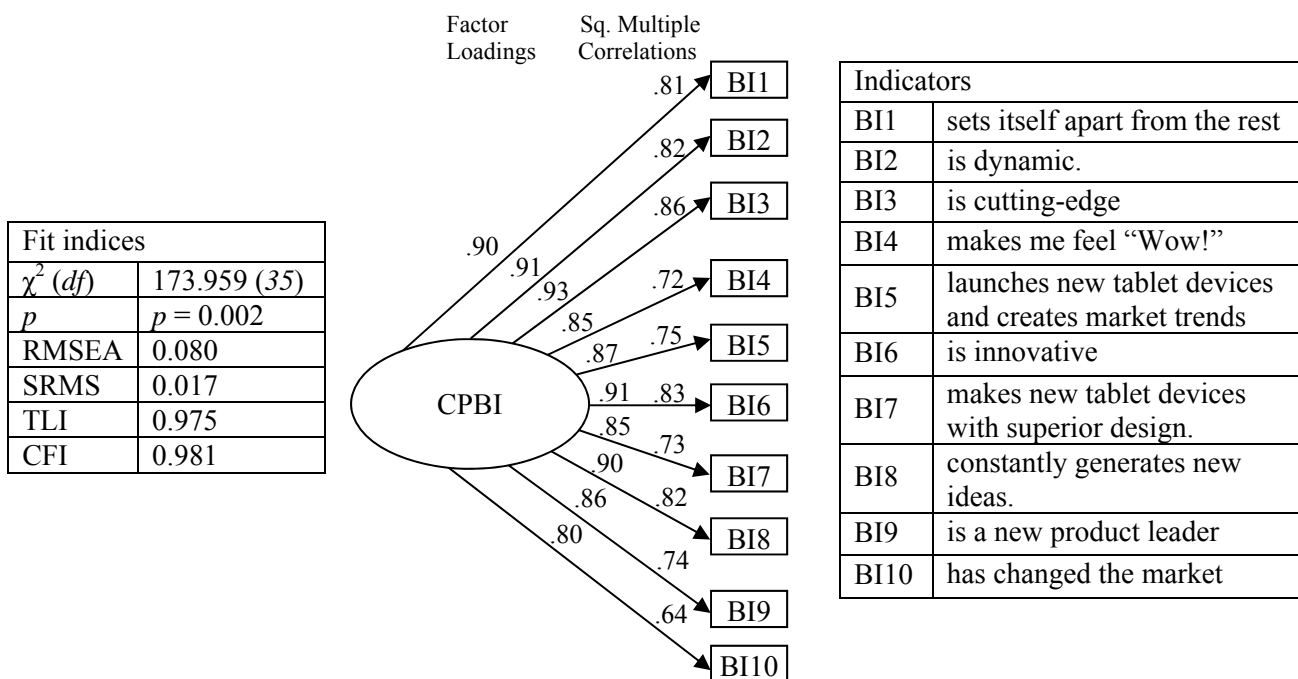


Figure 4.3 CFA on CPBI

As reviewed in Chapter 2, although the result of the CFA model fit assessment did not pass the strict test of exact fit (chi-square test at $p = 0.05$), for the following reasons it was concluded that the unidimensionality of the proposed measurement was warranted: Chi-square test is very sensitive to sample sizes greater than 200 (Bentler, 2010); the proposed measurement is based on the result of three complementary studies in the exploratory phase; the item generation was carefully examined and the scale passed excessive qualitative content validity examinations; item

their standard errors (SE-Bias), there was little evidence that the squared multiple correlations were biased. This was also the case for standardised regression weights. Hence, the reported factor loadings and squared multiple correlations are those obtained from the original sample.

redundancy was not found to be the case and it was concluded that every single item proposed a unique piece of information and; similar established scales in the firm innovativeness literature (e.g., Kunz et al., 2011) were proposed as unidimensional scales with more than 7 items.

4.3.6.2 Consumer perceived product innovativeness (CPPI)

The CFA results for the CPPI measurement model are depicted in Figure 4.4. Originally, the CFA results indicated poor model fit statistics. Items PI5 and PI6 indicated low level of reliability (less than 0.50), with a pattern of high absolute standardised residual covariance values (above 2.58) and error variances of values greater than 1.50. First, item PI5 was removed from the CFA model. The resulting model showed better fit to the data, however, the RMSEA was high at 0.117. Item PI6 was showing a low level of item reliability (0.37). Hence, item PI6 was also removed from the CFA model. The final CPPI measurement model included 4 items. The χ^2 value, p , and the other fit indices - TLI and CFI were above the criterion value, and the RMSEA value was below 0.08, thus confirming good fit of this model. As illustrated in Figure 4.4, all factor loadings exceeded the criterion value of 0.50. The standardised residuals and squared multiple correlations conform to prescribed cut-off values.

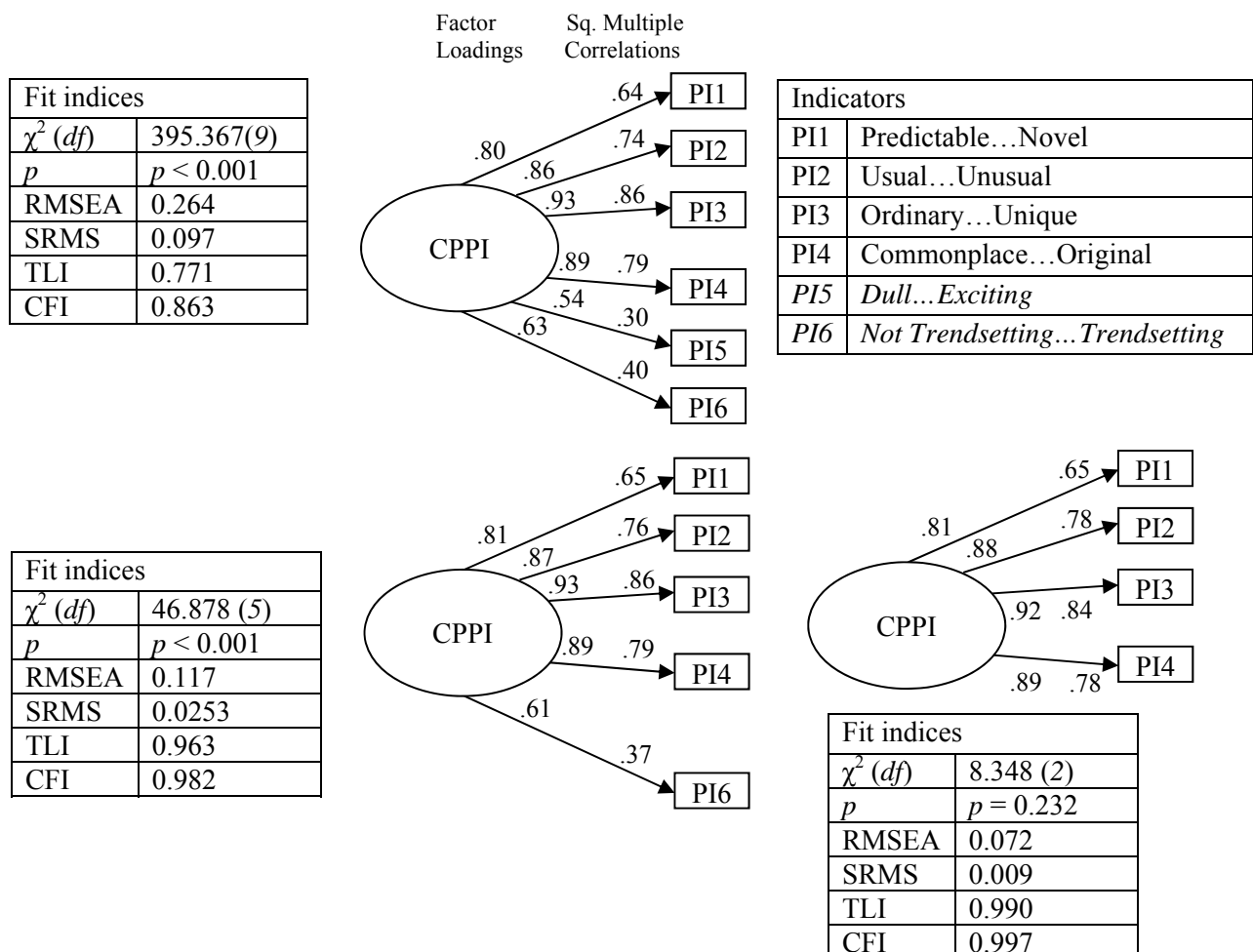


Figure 4.4 CFA on CPPI

4.3.6.3 Technological newness (TN)

As illustrated in Figure 4.5, all factor loadings exceeded the criterion value of 0.50. The standardised residuals and squared multiple correlations conform to prescribed cut-off values. The fit indices - TLI and CFI were well above the criterion value and the χ^2 value was not significant at $p = 0.001$. Although, the RMSEA value was slightly higher than 0.80, this figure is based on subjective judgment (Arbuckle, 2012; Byrne, 2011). It cannot be regarded as infallible or correct, but it is more reasonable than the requirement of exact fit with the RMSEA = 0.0 (Arbuckle, 2012). On the other hand, AMOS did not provide any meaningful modification suggestions. Hence, it was inclusive that the technological newness measurement model showed adequate fit.

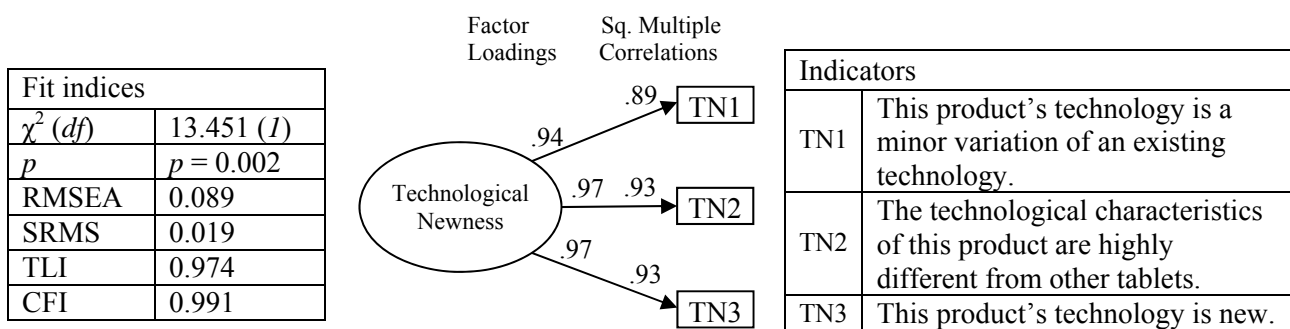


Figure 4.5 CFA on technological newness

Although the result of the CFA model fit assessment did not pass the strict test of exact fit (chi-square test at $p = 0.05$), for the following reasons it was concluded that the unidimensionality of the TN measurement was warranted: Chi-square test is very sensitive to sample sizes greater than 200 (Bentler, 2010) and in this study the sample size was 617; The study used previously established scale for the measurement of TN which has been conceptualised and operationalised as a unidimensional measure in other studies (Lowe & Alpert, 2013).

4.3.6.4 Purchase intention

The CFA results for the purchase intention measurement model are depicted in Figure 4.6. As illustrated in the figure, all fit indices and the parameter estimates for the model adhere to the prescribed cut-off values, confirming adequate fit for the purchase intention measurement model. Although the result of the CFA model fit assessment did not pass the strict test of exact fit (chi-square test at $p = 0.05$), for the following reasons it was concluded that the unidimensionality of the TN measurement was warranted: The chi-square result is significant at $p = 0.01$; Chi-square test is very sensitive to sample sizes greater than 200 (Bentler, 2010) and in this study the sample size was 617; The study used previously established scale for the measurement of purchase intention which

has been conceptualised and operationalised as a unidimensional measure in other studies (Lowe & Alpert, 2013; Moreau et al., 2001).

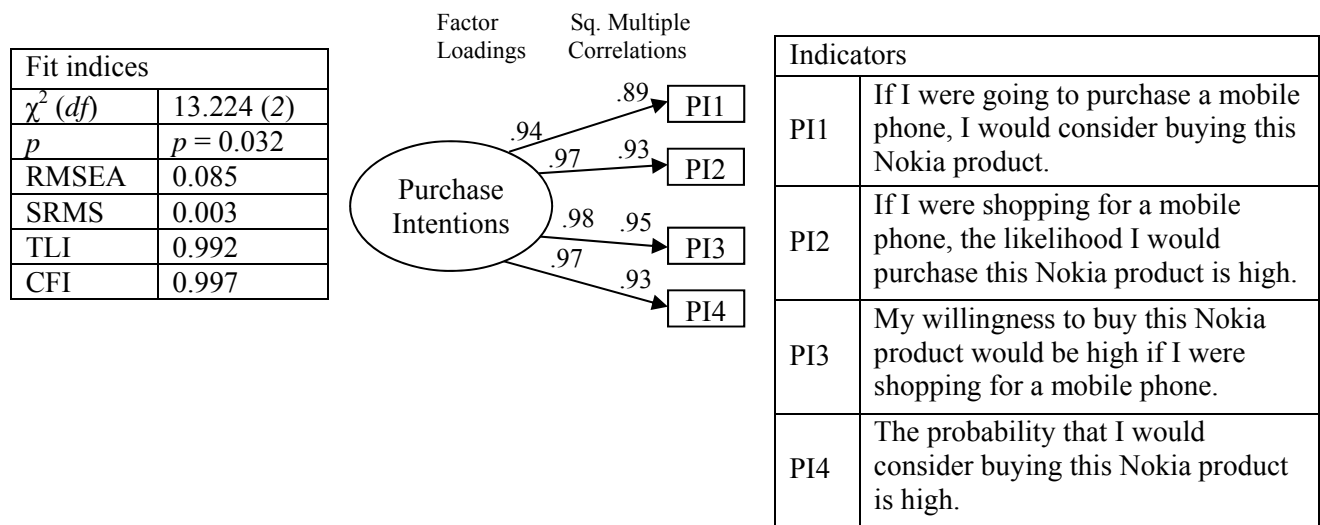


Figure 4.6 CFA on purchase intention

4.3.6.5 Brand attitude

The CFA results for the brand attitude measurement model are depicted in Figure 4.7. The original model indicated adequate fit, however the RMSEA value did not meet the recommended cut offs with a value around 0.2. Because all items showed good levels of factor loading ($\lambda > 0.5$) and reliability ($\lambda^2 > 0.5$) and there were no standardised residual values greater than 2.54, all items were left unchanged. However, in order to improve the fit of the initial model, based on the modification indices and following Kline (2011) and Byrne (2010), one error correlation was added to the CFA model, between two overlapping indicators of BA2 and BA3. These two items measure positivity and favourability aspects of brand attitude and it could be argued that they appeared to be expressing the same idea (or very similar ideas, Byrne, 2010). The revised model resulted in good model fit statistics.

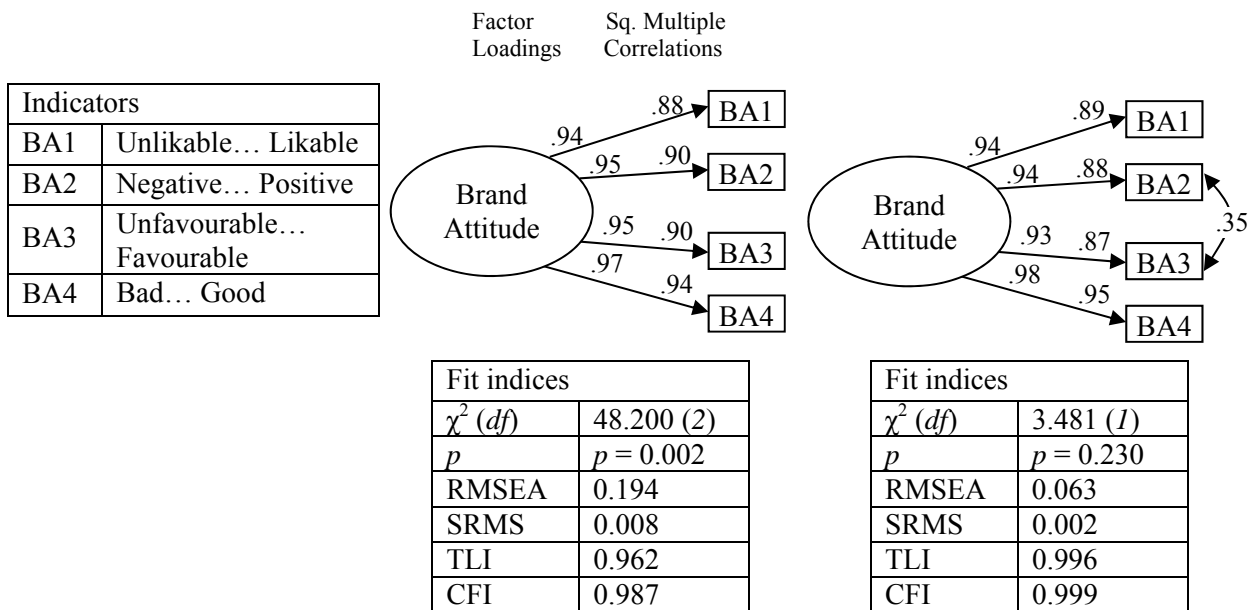


Figure 4.7 CFA on brand attitude

It is worth to mention that if measurement error covariances reflect item characteristics, they may represent a small omitted factor (Anderson & Gerbing, 1988). If, on the other hand, they represent respondent characteristics, they may reflect bias such as yea-saying or nay-saying, social desirability, and the like (Aish & Joreskog, 1990). Also, another type of method effect that can trigger error covariances is a high degree of overlap in item content (Byrne, 2010). Such redundancy occurs when an item, although worded differently, essentially asks the same question (Byrne, 2010). Considering that the thesis used previously validated scale for brand attitude which its unidimensionality has been numerous established in the literature and the sensitivity of the chi-square test to sample sizes greater than 200 (Bentler, 2010), it is concluded that the unidimensional measurement of the brand attitude congeneric model is warranted.

The above logics in assessing the fit of the CFA models have been adopted for assessing the fit of the CFA models in the field study, presented in the next Chapter.

4.3.7 Reliability and Validity

Because Cronbach's α is suspect as an estimate of reliability in the presence of correlated errors, both Cronbach's α and composite reliabilities (CR) were calculated to examine scale reliability following Hair et al., 2010 and Raykov (1997). The CR formula is shown below. If the result of the following formula equals and/or exceeds 0.80, the scale reliability of a construct is acceptable (Hair et al., 2010; Raykov, 1997).

$$CR = (\sum \lambda)^2 / [(\sum \lambda)^2 + (\sum 1 - \lambda^2)]$$

Where, λ = factor loading and λ^2 = squared multiple correlations

In a further step, the average variance extracted (AVE) of the constructs was also calculated. For a scale reliability to be established, the variance extracted by its measures should be larger than the variance extracted by the measurement error (Raykov, 1997). Thus, AVE is acceptable if it is above 0.50 (Garver & Mentzer, 1999). The construct AVE is calculated using the following formula, recommended by Hair et al. (2010):

$$AVE = \Sigma \lambda^2 / n$$

Where, λ^2 = squared multiple correlations and n = number of items

The reliability scores for the constructs are presented in Table 4.4. All reliability scores exceeded the recommended thresholds.

Table 4.4 Reliability statistics of the key constructs (n = 617)

Constructs	α	CR	AVE
Consumer perceived brand innovativeness	0.97	0.97	0.77
Consumer perceived product innovativeness	0.93	0.93	0.76
Technological newness	0.93	0.93	0.80
Purchase intention	0.98	0.98	0.92
Brand attitude	0.97	0.97	0.90

Notes: Post-CPBI values were used for the above calculations. Pre-CPBI values were also examined. Results were similar to Pre-CPBI, supporting construct reliability.

Similar to the procedures detailed in Chapter 2 and following procedures recommended by Bagozzi et al. (1991) a series of CFAs were conducted to examine discriminant validity among the key constructs of the model. Chi-square difference tests indicated that, in all cases, the fit for the two-factor model was significantly better than the fit for the single factor model ($\Delta df = 1$; $p < 0.001$), providing support for discriminant validity. Table 4.5 presents the results for discriminant validity.

To further establish the construct validity of the proposed CPBI scale, known-group validity test was implemented using Latent Mean Analysis (LMA) in AMOS 21. The test assesses how well the proposed CPBI measurement discriminates between groups (Netemeyer et al., 2003). It was expected that the CPBI scale was able to reliably distinguish between high innovative mobile phone brands (Apple and Samsung; $n = 312$, $M = 5.83$) and low innovative mobile phone brands (Nokia and Motorola; $n = 305$, $M = 4.24$). Taking in to account the measurement error, LMA is a stronger test of mean differences compared to t-tests.

Table 4.5 CFA results for discriminant validity ($n = 617$)

Factors	Two-factor model		One-factor model		$\Delta\chi^2$	Δdf
	χ^2	df	χ^2	df		
TN and CPPI	32.624	13	322.285	14	289.661	1*
TN and CPBI	245.371	64	1673.007	65	1427.636	1*
TN and BA	54.775	13	1427.019	14	1372.244	1*
TN and PI	41.821	13	1501.100	14	1459.279	1*
CPPI and BA	104.936	19	1864.048	20	1759.112	1*
CPPI and PI	98.868	19	4153.318	20	4054.45	1*
CPBI and CPPI	250.401	76	2140.376	77	1889.975	1*
CPBI and PI	283.557	76	4154.164	77	3870.607	1*
CPBI and BA	342.796	76	2536.190	77	2193.394	1*
BA and PI	104.450	19	3317.884	20	3213.434	1*

Notes: * $p < 0.001$. TN = Technological newness; CPPI = Consumer perceived product innovativeness; CPBI = Consumer perceived brand innovativeness BA = Brand attitude; PI = Purchase intention. Post-CPBI values were used for the above calculations. Pre-CPBI values were also examined. Results were similar to Pre-CPBI, supporting discriminant validity.

Following procedures prescribed by Byrne (2010), the model was fixed to have invariant item intercepts and factor loadings, as a necessary condition for comparing CPBI mean across high and low innovative mobile phone brands. For identification requirement, the mean for low CPBI group was fixed to zero. The CPBI constrained model displayed good fit to the data ($\chi^2 [88] = 318.514, p = 0.000, TLI = 0.959, CFI = 0.960, RMSEA = 0.065, SRMR = 0.031$). The results indicated that the CPBI mean for high innovative brands was significantly different from zero ($M = 1.45, p = 0.000$). Given that the low CPBI group was designated as the reference group, and that the mean estimate for high CPBI group is positive, this finding was interpreted as indicating Apple and Samsung mobile phone brands appear to have significantly higher perceptions of CPBI than Nokia and Motorola mobile phone brands, supporting known-group validity of the proposed CPBI scale (Byrne, 2010).

4.3.8 The Structural Model

The previous sections established the psychometric properties, reliability and validity of the measures utilised in testing the CPBI processing model. In this section, the relationships between constructs in the conceptual model proposed in Chapter 3 are tested (Figure 4.8). As discussed in the model estimation and evaluation section, to test the proposed model, a MGA approach was used. Following procedures prescribed by Byrne (2010), a series of hierarchical steps including determination of the baseline model, the configural model and the MG model was conducted. These steps are detailed below.

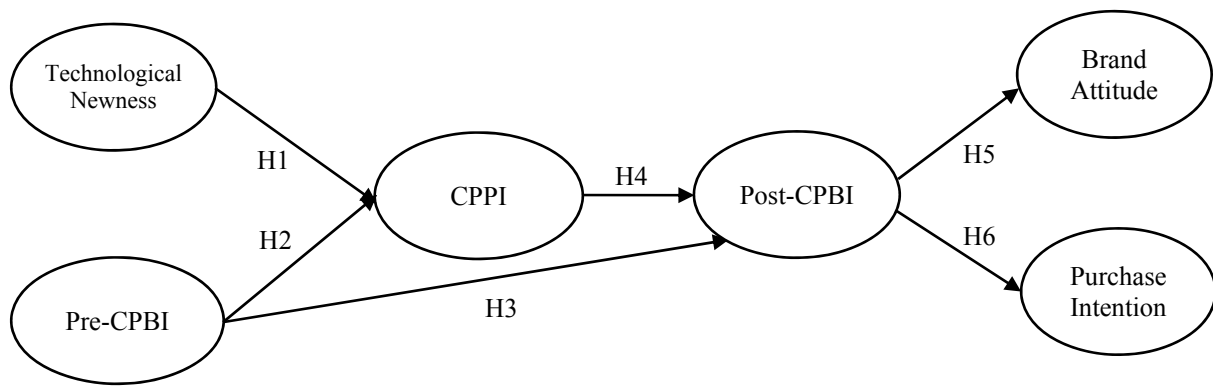


Figure 4.8 Consumer perceived brand innovativeness processing model

Notes: All arrows represent positive effects; CPPI = Consumer perceived product innovativeness; Pre-CPBI = Consumer perceived brand innovativeness prior to introduction of the innovation; Post-CPBI = Consumer perceived brand innovativeness after introduction of the innovation.

4.3.8.1 Model fit assessment

The baseline model represents the one that best fits the data from the perspectives of both parsimony and substantive meaningfulness (Byrne, 2010, p.199). To determine the baseline model following previous pretest–posttest studies utilising SEM (i.e., Simonin & Ruth, 1998), the hypothesised model was adapted to allow for three correlated error terms for the measures of pre- and post-CPBI (Arbuckle, 2012). This baseline model was identical for the pooled data and each sub-group data (i.e., highly innovative brands, low innovative brands, highly technologically new products and less technologically new products). The model displayed good fit to the pooled data ($\chi^2 [549] = 1615.820$, Bollen-Stine bootstrap $p > 0.001$, TLI = 0.960, CFI = 0.963, RMSEA = 0.056, SRMR = 0.042) with all fit indices above and within the recommended cut-offs. Also, no modification was proposed by AMOS regarding exclusion and/or inclusion of a structural path among the six constructs. It is worth to mention that although no misspecification was identified by the software, in order to finalise the baseline model prior testing across experimental groups and MGA process the model was tested against two competing models. Results provided support in favour of the proposed CPBI model. For readability and flow of the document, the results of competing model tests are reported in Section 4.5 Competing Models.

As indicated above, the model displayed good fit to the pooled data ($\chi^2 [549] = 1615.820$, Bollen-Stine bootstrap $p > 0.001$, TLI = 0.960, CFI = 0.963, RMSEA = 0.056, SRMR = 0.042) with all fit indices above and within the recommended cut-offs. The CPBI model also displayed acceptable fit to the data ($p > 0.001$) for all the four groups of highly innovative brands ($n = 312$), low innovative brands ($n = 305$), highly technologically new products ($n = 324$) and less technologically new products ($n = 293$) as shown in Table 4.6. Although a few TLI and CFI values

are slightly smaller than 0.95, Bagozzi and Yi (2012) argue that given $SRMR \leq 0.07$, a model fit is satisfactory with $RMSEA \leq 0.07$, $TLI \geq 0.92$ and $CFI \geq 0.93$ (cf., Marsh, Hau & Wen, 2004).

Table 4.6 SEM results for the hypothesised model - 1

Fit statistics	Pooled data <i>n</i> = 617	Highly Pre-CPBI <i>n</i> = 312	Low Pre-CPBI <i>n</i> = 305	Highly TN <i>n</i> = 324	Low TN <i>n</i> = 293
$\chi^2(df)$	1615.820 (549)	1160.465 (549)	1210.732 (549)	1084.896 (549)	1251.093 (549)
<i>p</i> *	0.002	0.002	0.002	0.002	0.002
TLI	0.960	0.949	0.946	0.961	0.940
CFI	0.963	0.953	0.950	0.964	0.945
RMSEA	0.056	0.060	0.063	0.055	0.066
SRMR	0.042	0.054	0.049	0.052	0.047

*Notes:** Bollen-Stine bootstrap *p*. Number of distinct parameters to be estimated for all of the above models = 81 (35 regression weights, 5 covariances and 41 variances)

Following completion of this task, the CPBI model was then tested in a multiple group model by having keyed in the name associated with each group, together with the related data files in AMOS 21. This step resulted in producing the configural model; the baseline CPBI model tested simultaneously across groups. This MGA not only allows for hypothesis testing across groups, it also confirms the cross-validity of the model across groups (Jöreskog & Sörbom, 1993). Two MGAs were implemented. MGA1 was conducted by fitting the CPBI model simultaneously across two groups of highly and low innovative brands. The fit statistics of this configural model were acceptable ($\chi^2 [1098] = 2371.197$, Bollen-Stine bootstrap $p > 0.001$, $TLI = 0.947$; $CFI = 0.952$ $RMSEA = 0.043$; $SRMR = 0.054$). MGA2 was also conducted by fitting the CPBI model simultaneously across two groups of highly and less technologically new products. The fit statistics of this configural model were good ($\chi^2 [1098] = 2335.989$, Bollen-Stine bootstrap $p > 0.001$, $TLI = 0.951$; $CFI = 0.955$, $RMSEA = 0.043$; $SRMR = 0.052$).

The CPBI model (fitted on the pooled data) explained a respectable portion of variance of the dependent variable post-CPBI (the phenomenon under investigation in this thesis) and dependent variable brand attitude. Specifically, the R^2 of post-CPBI was 75% and brand attitude was 71%. The model also explained a significant amount of the variance in consumers' purchase intention (21%).

4.3.8.2 Structural path assessment

The standardised path estimates are presented in Table 4.7. Examining the patterns of results across pooled data, MGA1 and 2 revealed full support for Hypotheses 1, 3, 4, 5 and 6 and partial support for Hypothesis 2. In the hypothesised model, the technological newness – consumer

perceived product innovativeness path (Hypothesis 1) is positive and statistically significant ($p < 0.001$, $\beta = 0.86$, extremely strong effect). Hypothesis 2 is partially supported as the pre-CPBI – CPPI path is positive and statistically significant ($\beta = 0.10$, $p < 0.001$), while this relationship is not supported for high pre-CPBI and high TN conditions. The predictable effect of pre-CPBI on post-CPBI (Hypothesis 3) is supported ($\beta = 0.77$, $p < 0.001$, strong effect). Hypothesis 4 refers to the positive effect of the consumer’s perception of a product innovation (CPPI) on his perception of its brand’s innovativeness (CPBI). This substantial mild effect is statistically significant ($\beta = 0.24$, $p < 0.001$) supporting Hypothesis 4. Finally, the post-CPBI - brand attitude path is positive and statistically significant ($\beta = 0.84$, $p < 0.001$) supporting Hypothesis 5. Hypothesis 6 is also supported as the post-CPBI – purchase intention path is positive and statistically significant ($\beta = 0.46$, $p < 0.001$). The support for these two latter hypotheses suggests that the consumer’s perception of a brand’s innovativeness has an extremely strong positive impact (Hair et al., 2010) on the consumer’s attitude toward the brand and a moderately strong effect (Hair et al., 2010) on the consumer’s purchase intention. These results are also summarised in Table 4.8.

Table 4.7 SEM results for the hypothesised model - 2

Path	Standardised Path Estimates				
	Pooled data	MGA1		MGA2	
		High Pre-CPBI	Low Pre-CPBI	High TN	Low TN
TN → CPPI	0.86 (22.060)	0.87	0.85	0.77	0.69
Pre-CPBI → CPPI	0.10 (3.983)	0.04 ^{ns}	0.11	0.05 ^{ns}	0.22
Pre-CPBI → Post-CPBI	0.77 (23.859)	0.80	0.66	0.74	0.81
CPPI → Post-CPBI	0.24 (9.624)	0.19	0.32	0.29	0.17
Post-CPBI → BA	0.84 (27.512)	0.77	0.83	0.84	0.84
Post-CPBI → PI	0.46 (12.084)	0.30	0.63	0.41	0.66

Notes: All paths are positive effects and significant at 0.001(two-tailed) unless otherwise it is specified; ns = not significant; t values are printed in brackets. CPBI = Consumer perceived brand innovativeness; TN = Technological newness; CPPI = Consumer perceived product innovativeness; BA = Brand attitude; PI = Purchase intention. Number of distinct parameters to be estimated for the pooled data model = 81 (35 regression weights, 5 covariances and 41 variances). Taking in to account both groups of high and low Pre-CPBI (TN), then, number of distinct parameters to be estimated for the MGA1 (MGA2) is 162.

Table 4.8 Pooled data path estimates: The proposed CPBI model

Hypothesised relationships	Stand. Path Estimates (T-value)	Decisions
H1: Perceived technological newness positively impacts consumer perceived product innovativeness.	0.86 (22.060)	Supported
H2: Pre-consumer perceived brand innovativeness positively impacts consumer perceived product innovativeness.	0.10 (3.983)	Supported
H3: Pre-consumer perceived brand innovativeness positively impacts post-consumer perceived brand innovativeness.	0.77 (23.859)	Supported
H4: Consumer perceived product innovativeness positively impacts post-consumer perceived brand innovativeness.	0.24 (9.624)	Supported
H5: Post-consumer perceived brand innovativeness positively impacts attitudes toward the brand.	0.84 (27.512)	Supported
H6: Post-consumer perceived brand innovativeness positively impacts consumer purchase intention.	0.46 (12.084)	Supported

The total effects of antecedents on consumer perceived brand innovativeness are presented in Table 4.9. As discussed earlier in the establishing of the baseline model, no modification regarding inclusion and/or exclusion of a structural path was suggested by AMOS.

Table 4.9 Standardised total effects of antecedents on post-CPBI

<i>Antecedents</i>	CPBI		
	Direct effect	Indirect effect	Total effect
Pre-Consumer perceived brand innovativeness	0.771	0.024	0.795
Consumer perceived product innovativeness	0.238	0.000	0.238
Technological newness	0.000	0.204	0.204

Total effects suggest that a one standard deviation change in pre-consumer perceived brand innovativeness leads to a 0.795 standard deviation change in the impact it has on post-consumer perceived brand innovativeness. Similarly, a one standard deviation change in consumer perceived product innovativeness leads to 0.238 standard deviation change in the total effect it has on post-consumer perceived brand innovativeness. Likewise, a one standard deviation change in the technological newness leads to a 0.204 standard deviation change in the post-consumer perceived brand innovativeness.

4.3.8.3 Testing for structural paths equivalences

As shown in Table 4.7 the regression weights are different across highly and low innovative brands as well as high and low technological newness. For example, it seems that for

Hypothesis 5 the impact of post-CPBI on brand attitude is slightly stronger for low innovative brands (0.83 versus 0.77). To further analyse the equivalency of the structural paths across highly and low innovative brands as well as high and low technological newness, a series of tests that constitutes invariance testing through MGA3 was conducted. The process includes testing the invariance of estimated parameters of two nested models across groups. The chi-square difference test exhibiting a probability < 0.05 (Bollen, 1989; Byrne, 2010; Jöreskog & Sörbom, 1993) was employed to test for nested model fits. Results for MGA3 are reported in Table 4.10. Note that Table 4.10 does not include the test for equivalency of the effect of pre-CPBI on CPPI (discussed above) as the effect was not significant for both highly innovative brands and highly technologically new innovations.

Together, Tables 4.7 and 4.10 suggest that the effect of technological newness on consumer perceived product innovativeness is equivalent for both highly and low innovative brands (Hypothesis 1: $\Delta\chi^2 = 4.435, p > 0.05$). Similar results were found for high and low technological newness groups ($\Delta\chi^2 = 3.308, p > 0.05$). Regarding the controlling Hypothesis 3 (pre-CPBI – post-CPBI), the effect is stronger for highly innovative brands ($\beta = 0.80$) compared to low innovative brands ($\beta = 0.66, \Delta\chi^2 = 24.955, p < 0.05$) and equivalent for high and low technological newness conditions ($\beta = 0.74$ and $0.81, \Delta\chi^2 = 7.232, p > 0.05$). Also, the effects of consumer perceived product innovativeness (CPPI) on post-CPBI (Hypothesis 4) for highly innovative brands ($\beta = 0.19$) and highly technologically new innovations ($\beta = 0.29$) are statistically significantly different from their low innovativeness counter-parts; 0.32 and 0.17 respectively. The impact is stronger for the low innovative brand and the highly technologically new innovation conditions ($\Delta\chi^2 = 13.137, \Delta\chi^2 = 22.821, p < 0.05$, respectively).

The effect of post-consumer perceived brand innovativeness on brand attitude (Hypothesis 5) is equivalent for both highly and low innovative brands ($\Delta\chi^2 = 3.521, p > 0.05$). Similar results were found for high and low technological newness groups ($\Delta\chi^2 = 0.460, p > 0.05$). However, the effect of post-CPBI on purchase intention (Hypothesis 6) for highly innovative brands ($\beta = 0.30$) is statistically significantly different from this effect for low innovative brands ($\beta = 0.63$). The impact is stronger for low innovative brands ($\Delta\chi^2 = 8.015, p < 0.05$). More details are provided in Section 4.4 Discussion.

Table 4.10 Fit statistics for tests of path structure equivalence

Across high and low pre-CPBI					
Model description	Comparative model	χ^2	<i>df</i>	$\Delta\chi^2$	Δdf
1. Measurement model: All factor loadings and correlated errors constrained equal	–	2456.526	1127	–	–
2. Structural model: All regression weights constrained equal.	2 versus 1	2490.333	1133	33.807	6*
3. Regression weight for post-CPBI on BA constrained equal.	3 versus 1	2460.047	1128	3.521	1 ^{ns}
4. Regression weights for post-CPBI on BA and PI constrained equal.	4 versus 1	2464.542	1129	8.015	2*
5. Regression weights for post-CPBI on BA and CPPI on post-CPBI constrained equal.	5 versus 1	2469.699	1129	13.137	2*
6. Regression weights for post-CPBI on BA and TN on CPPI constrained equal.	6 versus 1	2460.961	1129	4.435	2 ^{ns}
7. Regression weights for post-CPBI on BA, TN on CPPI and pre- on post-CPBI constrained equal.	7 versus 1	2481.482	1130	24.955	3*
Across high and low TN					
1. Measurement model: All factor loadings and correlated errors constrained equal	–	2378.295	1127	–	–
2. Structural model: All regression weights constrained equal.	2 versus 1	2416.378	1133	38.083	6*
3. Regression weight for post-CPBI on BA constrained equal.	3 versus 1	2378.755	1128	0.460	1 ^{ns}
4. Regression weights for post-CPBI on BA and PI constrained equal.	4 versus 1	2381.035	1129	2.740	2 ^{ns}
5. Regression weights for post-CPBI on BA and PI and CPPI on post-CPBI constrained equal.	5 versus 1	2401.115	1130	22.821	3*
6. Regression weights for post-CPBI on BA and PI and TN on CPPI constrained equal.	6 versus 1	2381.603	1130	3.308	3 ^{ns}
7. Regression weights for post-CPBI on BA and PI, TN on CPPI and pre- on post-CPBI constrained equal.	7 versus 1	2385.527	1131	7.232	4 ^{ns}

Notes: *Significant at 0.05; ns = not significant; CPBI = Consumer perceived brand innovativeness; CPPI = Consumer perceived product innovativeness; TN = Technological newness; BA = Brand attitude; PI = Purchase intention.

4.4 Laboratory Study Discussion

Results indicated that the technological features of a new product (highly or low new) have a strong effect on consumers' evaluation of the product's innovativeness (Hypothesis 1). This high impact is further conveyed to post-CPBI through CPPI and reinforces the importance of the perceived newness of technological aspects for a product to be perceived as a new offering by the brand.

In addition, the effect of technological newness on consumer perceived product innovativeness was found to be equivalent for products with high and low technological newness. Post hoc, one might expect to find a stronger (weaker) effect of technological newness on CPPI for highly (low) technologically new products compared with their low (high) counter-parts. However, this finding is consistent with the current innovation adoption literature. In the context of learning about innovative products, it has been found that discontinuous innovations are more difficult to comprehend and evaluate by consumers, mainly due to the difficulty consumers have in incorporating these new products into their existing product category knowledge structure (Moreau et al., 2001). The authors found consumers express higher difficulty in understanding specific features of the new product and the new product in general for discontinuous innovations compared with continuous innovations. In addition, a higher level of the surprise (wow) factor in discontinuous innovations compared with continuous innovations, lead to lower levels of comprehension for these products (Moreau et al., 2001).

Highly technologically new innovations are categorised as discontinuous innovations (Garcia & Calantone, 2002). Thus, borrowing from Moreau et al. (2001), it is very likely for the respondents to face higher levels of difficulty in comprehending and evaluating the highly technologically new mobile phone stimulus used in Study 7 compared with the less technologically new mobile phone. This lower level of ability to comprehend the highly technologically new mobile phone may prevent CPPI of this new product from being rated statistically significantly higher than its less technologically new counter-part and ultimately leads to an equivalent effect of TN on CPPI for both highly and low TN mobile phones.

Interestingly, this effect (Hypothesis 1: TN on CPPI) was also equivalent across highly and low innovative brands. It seems that the current level of brand innovativeness (pre-CPBI) does not affect this relationship. In other words, consumer perceived product innovativeness is mainly based on the technological newness of the product innovation than parent brand's innovativeness level. As long as consumers can find some level of technological newness in the product, they perceive the product as having some level of innovativeness, regardless of its parent brand's innovativeness level. This finding is consistent with the findings for Hypothesis 2 (pre-CPBI on CPPI) which are discussed below.

The effect of pre-consumer perceived brand innovativeness on consumer perceived product innovativeness (Hypothesis 2) was fully supported for the pooled data. However, this relationship was partially supported across the four experimental groups. The effect of pre-CPBI on CPPI was significant for pooled data, less technologically new products and low pre-CPBI. This relationship was not supported for highly technologically new products and for high pre-CPBI. In other words, it seems that consumers' judgement about a new product's innovativeness is not strongly affected by the parent brand' innovativeness level.

This finding slightly contrasts with the general consensus that corporate brand associations can influence perceptions of the company's products (Brown & Dacin, 1997; Keller, 2013). There are several possible explanations for this result. In the laboratory study, participants were exposed to the stimuli (informed respondents that brand A introduced this innovation) and rated consumer perceived product innovativeness based on this single exposure. A previous study on the effect of brand placements on branded product image found that brand placement affected the branded product image only when participants were exposed to a brand placement two or more times (Van Reijmersdal, Neijens, & Smit, 2007). Therefore, the absence of full support for the relationship between pre-CPBI and CPPI could be attributed to the limited consumer exposure to the brand–innovation pairing of this study. It has also been found that positive associations from the brand would be transferred to the new product upon consumers' exposure to multiple brand–innovation pairings through multiple communication strategies such as preannouncement and advertising (Lee & O'Connor, 2003). Pre-CPBI might have had a significant influence on CPPI in the other two experimental conditions if participants had received an array of promotional material featuring the brand–innovation pair. Furthermore, the results of this study do not suggest that the entire set of brand associations (the overall brand image) of a brand cannot transfer and influence product evaluations. Rather, the results imply that considering the strong antecedent role of technological newness on CPPI, the transfer of brand innovativeness-related associations from the parent brand to the product innovation could be limited.

The predictable effect of pre-CPBI on post-CPBI (Hypothesis 3) received strong support, regardless of the technological newness of the introduced innovation. Not surprisingly, the effect was stronger for highly innovative brands compared with low innovative brands. Strong brands (e.g., a highly innovative brand) possess a stronger, more favourable and more stable brand association network compared to weaker brands (Keller, 1993; Krishnan, 1996). Thus, pre-existing CPBI would be related more highly to the post-exposure CPBI for highly innovative brands.

Controlling for the effect of pre-consumer perceived brand innovativeness on its post values, a new product, regardless of featuring a high or low technological newness, leads to an enhancement of post-consumer perceived brand innovativeness (Hypothesis 4). The results

indicated that this enhancement is larger for low innovative brands than for highly innovative brands. One possible explanation for this interesting result is that for a highly innovative brand, innovativeness and its related associations (e.g., creativity, novelty, and dynamism) are core attributes which constitute its definition. These associations are the most salient and essential attributes for understanding a highly innovative brand (Eysenck & Keanne, 1990) which result in a stronger and more stable association network for a highly innovative brand compared to a low innovative brand. Prior research has found that salient attributes and a more stable association network are more difficult to change (Keller, 1993; Murphy 1988; Smith et al., 1988). Thus, a product innovation is more influential in changing the innovativeness attributes of a low innovative brand compared to a highly innovative brand.

This finding is also consistent with information integration theory-IIT (Anderson, 1981a) used to developed this relationship. Recall that based on IIT: Post-perception of brand A = Pre-perception of brand A + Perception of innovation. Using this formula with a simple numerical example below, it is clear that the effect of CPPI on post-CPBI is stronger for a low innovative brand. In the following calculations a high level CPPI (rated 7 out of 7) is used. The same results are found if a low CPPI is added to the formula. Consider a 7-point Likert scale and the averaging method for integration in these calculations:

	Pre-CPBI	+	CPPI	=	Post-CPBI	Δ (Post – Pre)	
<i>For a low pre-CPBI</i>	4	+	7	=	$11/2 = 5.5$	$5.5-4 = 1.5$	1.5 > 0.5
<i>For a high pre-CPBI</i>	6	+	7	=	$13/2 = 6.6$	$6.5-6 = 0.5$	

Also, this relationship (Hypothesis 4: CPPI on post-CPBI) was found to possess stronger effects when a brand introduces a highly technologically new product. Similarly, this finding is consistent with the principles of information integration theory; everything else equal, information with larger weight and value (importance and favourableness) is more effective in changing attitudes than information with lesser weight and value (Anderson, 1981a).

Finally, regarding the outcomes of CPBI, the results indicated a direct and positive relationship between consumer perceived brand innovativeness and brand attitude, providing support for Hypothesis 5. This is an important finding. This predisposition toward the brand may lead to consumer satisfaction. In essence, consumer perceived brand innovativeness may seed the expectation of satisfaction even before product consumption (Henard & Dacin, 2010; Stock, 2011). Furthermore, changes in brand attitude are associated contemporaneously with stock return and lead accounting financial performance (Aaker & Jacobson, 2001). The extremely strong coefficients of 0.84 on brand attitude, which is considered as constituting a large impact, reinforces the importance

of aiming to build CPBI. Efforts at building CPBI and ultimately increasing brand attitude are very likely to result in higher levels of satisfaction for consumers as well as value for firms.

In addition to generating positive attitude toward the brand, a positive CPBI does lead to an enhancement of consumer purchase intention with a moderately strong effect of 0.46 (Hair et al., 2010). Interestingly, this positive impact seems to be stronger when a low innovative brand introduces a new product than a highly innovative brand (see Table 4.7). One possible explanation for this result is that strong parent brands may have a dominant influence in purchase intention formation because of their high-innovativeness reputations and consequent high level of diagnosticity (Bian & Forsythe, 2012; Kunz et al., 2011). However, weak parent brands, which have mediocre innovativeness reputations, may have a less dominant influence because of their less distinctive innovativeness reputations and consequent low diagnosticity. Thus, purchase intentions may be formed more easily for strong brands with high level of innovativeness (e.g., Samsung) than for weak brands with low level of innovativeness (Nokia), regardless of the presence of an innovation, because of the high diagnosticity of the strong and highly innovative brand. Consequently, an innovation will be more distinct in the purchase intention formation of the weak brand, due to the lesser dominance of the weak parent brand. This distinction will enable an innovation, either as a highly technologically new or a less technologically new product, to create greater purchase intentions for low innovative brands than for highly innovative brands.

4.5 Competing Models

As discussed, the proposed CPBI model was tested against two alternative models. While the literature does not provide a consensus on what would be a competing model (Byrne, 2010; Kline, 2011), the present thesis tests for two competing models which seems reasonable from the perspectives of both SEM practice and theoretical meaningfulness. Following Morgan and Hunt (1994) the proposed CPBI model was compared with its competing models using four criteria: (1) overall fit of the model measured by CFI; (2) percentage of the model's significant hypothesised relationships; (3) ability to explain variance in the DVs measured by squared multiple correlations and; (4) parsimony as measured by TLI (Tucker and Lewis index) which rewards for model parsimony/penalizes for model complexity (Baggozi & Yi, 2012).

Competing model 1. A nonparsimonious competing model could be one positing only direct paths from all of the IVs to the outcomes (Byrne, 2010; Morgan & Hunt, 1994). This model is presented in Figure 4.9. In this competing model CPPI (consumer perceived product innovativeness) and post-CPBI are nomologically similar to technological newness and pre-CPBI. In other words, the competing model allows no indirect effects. Although this competing model has not been theorised before, previous studies have suggested product innovations as a potential driver

of brand attitude (Aaker, 2007; Aaker & Jacobson, 2001) and purchase intention (Alexander et al., 2008; Moreau et al., 2001).

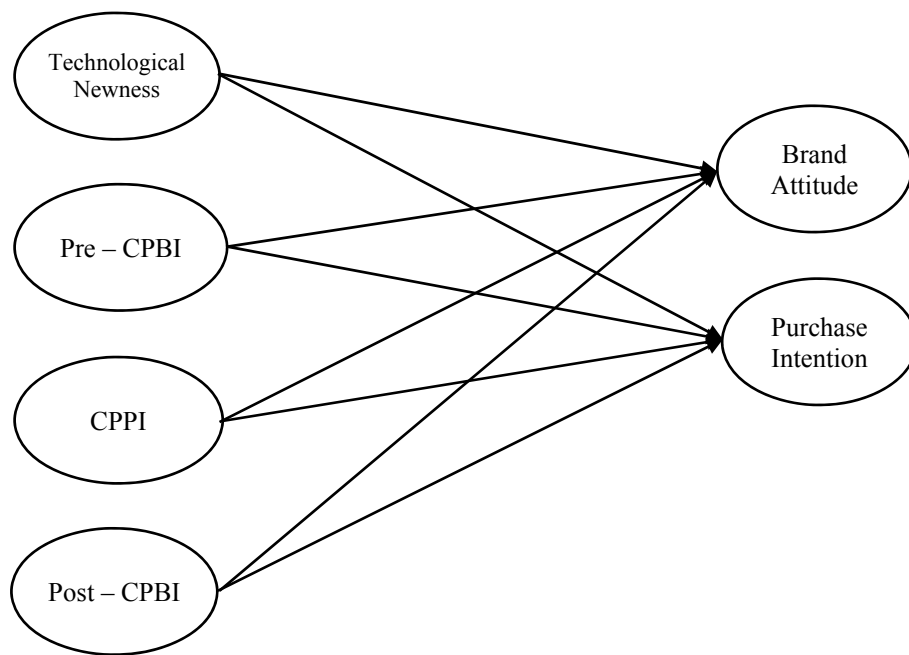


Figure 4.9 Competing model 1

Notes: CPPI = Consumer perceived product innovativeness; Pre-CPBI = Consumer perceived brand innovativeness prior to introduction of the innovation; Post-CPBI = Consumer perceived brand innovativeness after introduction of the innovation.

The results of model fit and structural paths assessments are presented in Table 4.11.

Table 4.11 Competing model 1 results

Hypothesised relationships	Standardised Path Estimates (T-value)	<i>p</i> = 0.05
Technological newness → Brand Attitude	-0.11 (-1.907)	Non-significant
Technological newness → Purchase Intention	-0.21(-2.262)	Significant, <i>Non-significant at p < 0.01</i>
Pre-CPBI → Brand Attitude	0.15 (3.184)	Significant
Pre-CPBI → Purchase Intention	-0.29 (-4.099)	Significant
CPPI → Brand Attitude	0.15 (2.410)	Significant, <i>Non-significant at p < 0.01</i>
CPPI → Purchase Intention	0.00 (-0.008)	Non-significant
Post-CPBI → Brand Attitude	0.70 (13.533)	Significant
Post-CPBI → Purchase Intention	0.78 (10.146)	Significant

$\chi^2 [542] = 1564.827$, Bollen-Stine bootstrap *p* > 0.001, TLI = 0.961, CFI = 0.965, RMSEA = 0.055

Notes: *p* = 0.05, CPBI = Consumer perceived brand innovativeness; CPPI = Consumer perceived product innovativeness.

Although the CFI for the competing model was negligibly higher (CFI = 0.963 versus 0.965; Δ CFI = 0.002), six of eight (75%) of its hypothesised relationships were supported at the $p < 0.05$ level (including only four of eight (50%) supported at $p < 0.01$). In contrast, all of the hypothesised relationships in the proposed CPBI model were supported at the $p < 0.001$ level. Importantly, all of the significant direct effects in the competing model are significant direct or indirect effects in the proposed CPBI model. Moreover, little, if any, additional explanatory power was gained from the additional two paths. The competing's SMCs were brand attitude = 0.71, and purchase intention = 0.26. While the SMC for the purchase intention indicated a 5% improvement (0.26 versus 0.21), there was no improvement in the explanatory power of the brand attitude (0.71 versus 0.71).

As Figures 4.8 and 4.9 show that there is a difference in parsimony between the proposed CPBI model and the competing model 1 (6 versus 8 paths). Because CFI does not account for parsimony differences (Arbuckle, 2012), the two models were compared using TLI (Morgan & Hunt, 1994). The competing model 1's TLI of 0.961 is not meaningfully different from the proposed CPBI model's TLI of 0.960. The proposed model accomplished an improvement in parsimony (from 8 paths to 6 paths) by sacrificing 0% in CFI which worth making for the sake of parsimony (Byrne, 2010; Morgan & Hunt, 1994). In general, compared to the proposed CPBI model, the direct competing model was not found superior. In other words, competing model 1, which could be called a 'null theory model' in this context, provides no fit benefits, and also no benefit of providing a theory structure to the variables.

Competing model 2. The positive effect of brand attitude on purchase intention has been well established in the literature (Farley & Ring, 1970; Howard & Sheth, 1969). Thus, the proposed CPBI model was tested against another competing model which included the structural path from brand attitude to purchase intention. This model is presented in Figure 4.10.

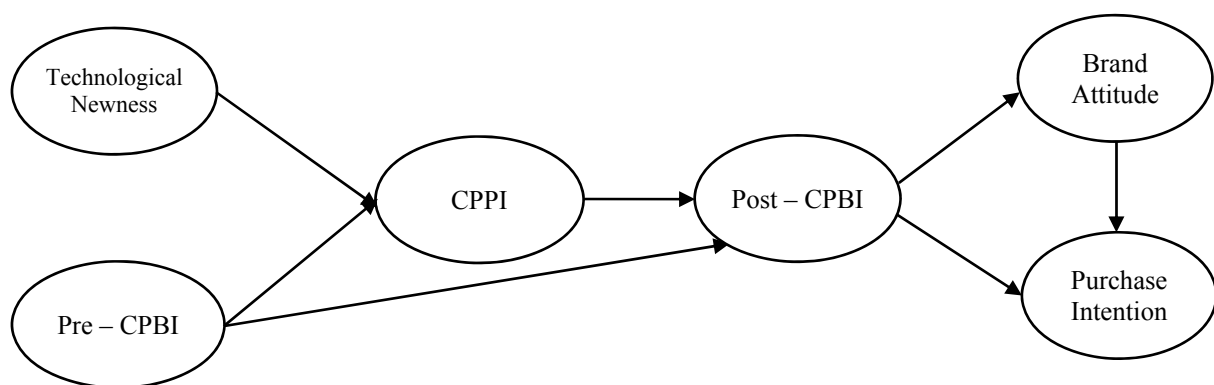


Figure 4.10 Competing model 2

Notes: CPPI = Consumer perceived product innovativeness; Pre-CPBI = Consumer perceived brand innovativeness prior to introduction of the innovation; Post-CPBI = Consumer perceived brand innovativeness after introduction of the innovation.

The results of model fit and structural paths assessments are presented in Table 4.12.

Table 4.12 Competing model 2 results

Hypothesised relationships	Standardised Path Estimates (T-value)	$p = 0.05$
Technological newness → CPPI	0.86 (22.060)	Significant
Pre-CPBI → CPPI	0.10 (3.982)	Significant
Pre-CPBI → Post-CPBI	0.77 (23.869)	Significant
CPPI → Post-CPBI	0.24 (9.640)	Significant
Post-CPBI → Brand Attitude	0.84 (27.495)	Significant
Post-CPBI → Purchase Intention	0.35 (4.885)	Significant
Brand Attitude → Purchase Intention	0.13 (1.749)	Non-significant
$\chi^2 [548] = 1612.783$, Bollen-Stine bootstrap $p > 0.001$, TLI = 0.960, CFI = 0.963, RMSEA = 0.056		
Notes: $p = 0.05$, CPBI = Consumer perceived brand innovativeness; CPPI = Consumer perceived product innovativeness.		

The CFI values were identical for the proposed CPBI and the competing model 2 (CFI = 0.963) and the additional path did not result in a better model fit. Also, the hypothesised relationship between brand attitude and purchase intention was non-significant ($\beta = 0.13$, $p > 0.05$), thereby six of seven (85%) of the hypothesised relationships were supported at the $p < 0.001$ level. In contrast, all of the in hypothesised relationships in the proposed CPBI model were supported at the $p < 0.001$ level. Moreover, little, if any, additional explanatory power was gained from the additional path. The competing's SMCs were brand attitude = 0.71, and purchase intention = 0.22. While the SMC for the purchase intention indicated a 1% improvement (0.22 versus 0.21), there was no improvement in the explanatory power of the brand attitude (0.71 versus 0.71).

The TLI values were identical for the proposed CPBI and the competing model 2 (TLI = 0.960). The proposed model accomplished an improvement in parsimony (from 7 paths to 6 paths) by sacrificing 0% in CFI which worth making for the sake of parsimony (Byrne, 2010; Morgan & Hunt, 1994). In general, compared to the proposed CPBI model, the direct competing model was not found superior. Moreover, the focus of the present thesis was on the outcomes of consumer perceived brand innovativeness rather than the causes of purchase intention. The effect of brand attitude on purchase intention was not found to add to the contributions of the thesis. Hence, it was concluded that the proposed CPBI model incorporated sufficient number of parameters that adequately represent the data (Byrne, 2010; Kline, 2011).

4.6 Conclusion

This chapter reported the methods, analyses, and findings of testing the proposed CPBI processing model (developed in Chapter 3) in a laboratory study. The purpose was to address research questions (3) do firms' efforts to launch product innovations lead to CPBI and if so, how does exposure to the innovation affect consumer evaluations of the brand's innovativeness? and (4) what are the consequences of CPBI? The model was tested using a 2 (pre-CPBI: high vs. low) × 2 (technological newness: high vs. low) pretest-posttest mixed randomised factorial design. Respondents were 617 Australian adults. The CPBI scale developed through Studies A1 to B3 was used in this study. The data were subject to SEM and analysed through several MGA. The proposed CPBI model was also tested against two competing models. In sum, the CPBI processing model proposed in this thesis was generally supported. Five out of six hypotheses were fully supported across pooled data and the four experimental conditions and one hypothesis was partially supported. The proposed CPBI model explained a substantial variance in the consumer perceived brand innovativeness construct.

The result indicates that when a brand introduces a product innovation, consumers' perceptions of the product innovation's technological newness directly and positively impact consumers' perceptions of the product innovativeness (CPPI). The resulting CPPI positively affects consumers' perceptions of the brand innovativeness (CPBI). Also, CPBI does positively shapes consumer attitudinal and behavioural responses (purchase intention) to the innovative activities of the brand such as launching an innovation. The cumulative evidence of this laboratory model testing study and previous studies (A1 to B3, reported in Chapter 2) provides evidence for nomological validity of the proposed CPBI scale and shows that the CPBI scale performs well for both Australian student and adult respondents. These findings further confirm the construct validity of the CPBI scale developed in the thesis.

A major limitation associated with the proposed CPBI model is that the model examines the effect of a narrow selection of antecedents such as consumer perceived product innovativeness (CPPI) and technological newness (TN) on consumer perceived brand innovativeness (CPBI), thus, remaining other possible antecedents, such as consumer perceived firm innovativeness (CPFI), and consumer innovativeness as exogenous. Future studies are invited to extend findings of this study by examining a variety of factors that may contribute to CPBI formation. Results indicated that a new product (regardless of featuring a high or low technological newness) leads to an enhancement of post-consumer perceived brand innovativeness and this enhancement is larger for low innovative brands than for highly innovative brands. Although possible explanations for this interesting finding

were provided in details (see Section 4.4 Laboratory Study Discussion), future research is invited to further investigate the dynamics of this effect.

Furthermore, the phenomenon under study, CPBI, and consumer response to it is complex, and the laboratory study is therefore limited by focusing upon one product category and fictitious product innovations. The logical step for future research is to replicate and extend the findings of this study by examining real product innovations and different product categories. The CPBI scale has been repeatedly validated in Chapter 2 and in this chapter, but exclusively in Australia, thus, leaving open the question of scale's applicability to non-Australian consumers. These limitations are addressed in a field study by testing the CPBI processing model for two real product innovations from the tablet category, using an American sample. Therefore, (a) to test for the validity, replicability, and generalisability of the proposed CPBI processing model across different populations, (b) to examine the application of results of the laboratory study to real world situations, and (c) to further establish construct validity for the CPBI scale, a field study was conducted using an American consumer panel and real product innovations. This study is reported in the next chapter.

Chapter 5 Testing the Generalisability of the CPBI Scale and Processing Model: Field Study

5.1 Introduction

The previous chapters developed and validated the CPBI scale as well as the CPBI processing model among Australian consumers. This chapter provides evidences for generalisability of the previous chapters' findings including construct validity of the CPBI scale across Australian and American populations in a field study. This study addresses research questions (3) do firms' efforts to launch product innovations lead to CPBI and if so, how does exposure to the innovation affect consumer evaluations of the brand's innovativeness? and (4) what are the consequences of CPBI? – using a different population (the USA) and real product innovations. The chapter first discusses the overall methodological framework the study. Next, the analysis and results are presented.

5.2 Field Study Method

Quantitative techniques were used to collect and analyse data in this study using a cross-sectional survey design. Quantitative research adheres to the post-positivist principles adopted by the present thesis, because it revolves around testing and confirming hypotheses formed on the basis of existing theory (Neuman, 2011). With the post-positivist paradigm emphasis on expansion of the scope of a theory and reduction of specific theories into more general theories (Hunt, 1991), the employment of a survey design is the technique aligned with the principles of this approach. After establishing the underlying causal mechanisms of CPBI through experimentation, survey studies could be applied to further delineate the application and generalisability of the theory in the real world (Hoyle et al., 2002; Mitchell & Jolley, 2013). Due to the underlying limitation of the field study, it was not possible to measure the pre-CPBI and test for its effect on CPPI and post-CPBI. More details are provided below.

5.2.1 Product Category, Brand Names and Design

Ideally, and following previous studies, the mobile phone category and brand names of Apple, Samsung, Nokia and Motorola were targeted for the field study. During thesis data collection and initial thesis writing activities (September 2013 to March 2014) none of the above mobile phone brands introduced a new mobile phone. However, both Apple and Nokia companies introduced a new product in to the tablet market in late 2013. On 22 October 2013, Apple

announced the release of the iPad Air and within a month, on 22 November 2013 Nokia launched its new tablet named Nokia Lumia 2520.

The tablet category was deemed an appropriate product category for the field study because (a) the two categories (i.e., mobile phone and tablet) are tied together in terms of usage and user profiles such that the boundaries among a smart mobile phone, a tablet and a “*phablet*” (a portmanteau of the words *phone* and *tablet* - is a class of mobile device designed to combine the functions of a smartphone and tablet; Wikipedia, n.d.) are becoming increasingly blurred; (b) most of the mobile phone brands, especially the selected brand names of Apple, Samsung, Nokia and Motorola have been active in both mobile phone and tablet markets with several well-established products available to consumers; and (c) similar to the mobile phone category, the tablet category offers variation in CPBI.

It should be mentioned that the researcher was not able to measure pre-CPBI included in the pretest–posttest design of the laboratory study. The researcher (similar to any other consumer in the market) was informed about the introduction of iPad Air and Nokia Lumia 2520 tablets after their companies’ official announcement. The moment an innovation is introduced to the market, the pre-CPBI would effectively change to post evaluation of CPBI. This was also the case for any other previously launched innovations by these brands. The only way for a full replication of the proposed model was to perform a pretest–posttest field study in cooperation with an existing mobile phone company such as Samsung. This approach while potentially fruitful, would be very time consuming, expensive, probably unachievable and beyond the thesis scope. Thus, in this study the focus was on post-CPBI evaluations of Apple and Nokia in the tablet market after launching iPad Air and Lumia 2520. Specifically, the field study re-examined four out of six proposed relationships, excluding the effects of pre-CPBI on CPPI (Hypothesis 2) and pre-CPBI on post-CPBI (Hypothesis 3). List of field study hypotheses are provided below.

Hypothesis 1: Perceived technological newness positively impacts consumer perceived product innovativeness.

Hypothesis 4: Consumer perceived product innovativeness positively impacts consumer perceived brand innovativeness.

Hypothesis 5: Consumer perceived brand innovativeness positively impacts attitudes toward the brand.

Hypothesis 6: Consumer perceived brand innovativeness positively impacts consumer purchase intention.

5.2.2 Participants

A total of 420 American consumers varying in sex and age participated in this study. Sample characteristics are detailed in Section 5.3.1 Sample Characteristics. The participants were

generated and randomly assigned to one of the two surveys (Apple iPad Air vs. Nokia Lumia 2520) in cooperation with a professional marketing research agency (Qualtrics). Similar to laboratory model testing study, the sample size has been estimated to ensure the statistical assumptions of SEM (minimum $n = 200$) are met (Bentler & Chou, 1987).

5.2.3 Data Collection Procedures and Instrumentation

Data were collected in early 2014. Participants were randomly assigned to one of the two surveys using Qualtrics online consumer panel facilities. Two versions of online questionnaire were developed. Each questionnaire contained five sections (see Appendix D for the sample questionnaire) and each section appeared in a separate page. A schematic representation of the instrumentation is shown in Figure 5.1. In brief, sections one, two and five of the questionnaire were constant across the two survey instruments. The third section measured CPPI for the target innovation (Apple iPad Air and Nokia Lumia 2520 tablet) and varied across the two versions of the questionnaire. The fourth section measured the post-CPBI for Apple and Nokia in the tablet market and again varied across the two versions of the questionnaire¹⁵. The order of sections three and four were counter-balanced within each version of the questionnaire.

First, respondents read online materials containing general instructions and a brief cover story explaining that the research was aimed at exploring their perceptions of different brands and products in the tablet market. In section one, participants were required to rate scale items assessing the brand familiarity of the target brand (a covariate). Section two consisted of age and gender quotas requested by the researcher. To ease the process of screening out those respondents who did not meet the quota requirements, these two demographic questions were moved to the beginning of the questionnaire. Next, the product innovation picture (which was adopted from its company website) was shown to the respondents, followed by scales measuring technological newness, CPPI and product innovation – brand fit. In section four, the brand logo of the target brand was printed and respondents were required to rate the post-CPBI of the target brand (i.e., Nokia Lumia 2520), brand attitude and purchase intention. Finally, section five asked for some demographics, participants' previous purchase experience of the target tablet brand, participants' current tablet brand and one open-ended question for any comments from respondents. Participants then saw the "Thank You" page. Similar to the procedures detailed for laboratory model testing study, the questionnaire included a few IMC items to detect satisficing respondents (see also Section 4.2.3.1

¹⁵ Similar to the procedures explained in Chapter 4, to ensure the understandability and readability the questionnaire, it was first pilot tested on 20 students at UQ Business School. Results supported readability of the questionnaire as all questions were attempted by the respondents with no missing data. In addition, respondents were interviewed about the clarity of the structure and overall understandability of the instrument. Based on the results it was concluded that no question functioned oddly and the structure of the survey questionnaire was perceived clearly.

Detecting satisficing respondents for more details). Respondents who failed to fill out IMC questions correctly were automatically screened out of the study. See Appendix D for the sample questionnaire.

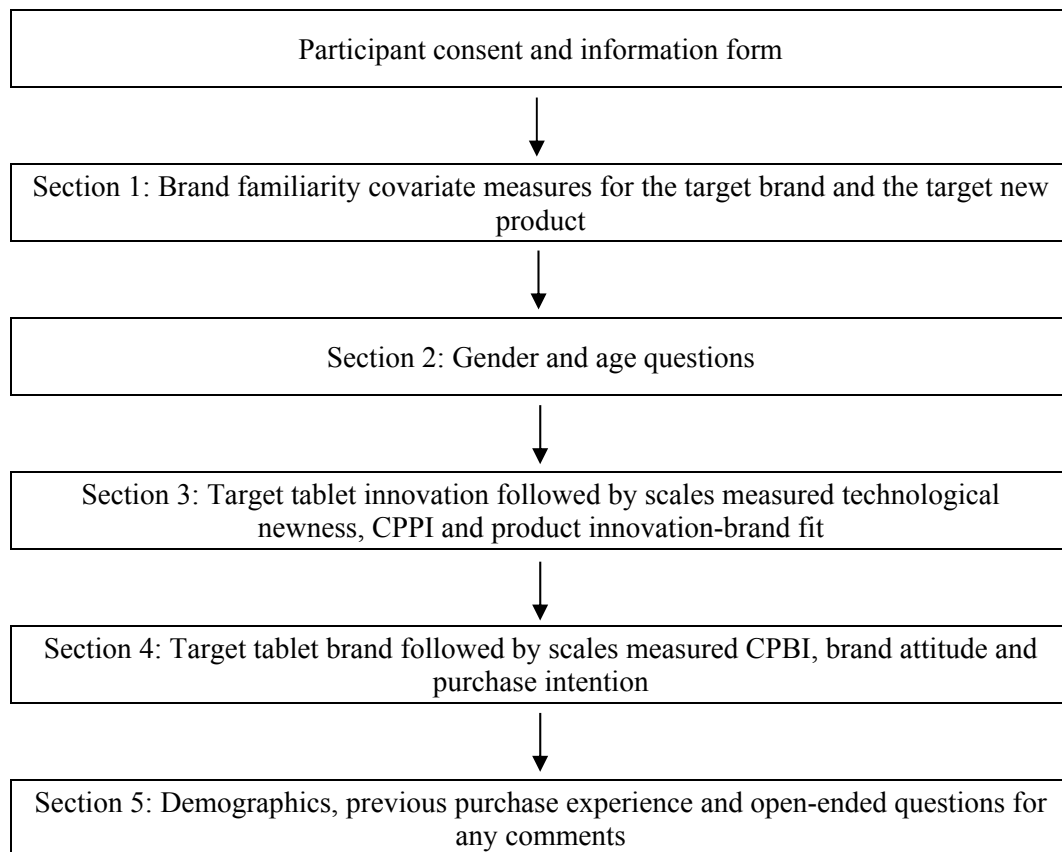


Figure 5.1 Summary of design and instrumentation for the field study

5.2.4 Measures and Measurement

The laboratory model testing measures were used in the present field study. See Appendix D for the sample questionnaire and scale items of the field study. See also Appendix E for a glossary of the measures used in this thesis.

5.2.5 Model Estimation and Evaluation

The approaches used in the laboratory CPBI model testing study were adopted for the field CPBI model testing study. Anderson and Gerbing's (1988) two step approach was utilised to estimate the CPBI processing model using AMOS 21. Multiple Group Confirmatory Factor Analysis (MGCFA) was also used to test for the CPBI construct validity across Australian and American consumers. Fit indices and cut-off values included were Chi-square (χ^2 , $p > 0.05$), root

mean square error of approximation ($RMSEA \leq 0.08$), standardised root mean-square ($SRMS \leq 0.08$), Tucker-Lewis index ($TLI \geq 0.95$) and comparative fit index ($CFI \geq 0.95$). Factor loadings (λ) above 0.5 and absolute standardised residual covariance values less than 2.58 were deemed as acceptable. Standardised regression weights (β) less than 0.2 are considered as weak, between 0.2–0.3 mild, between 0.3–0.5 moderately strong, between 0.5–0.8 strong, and more than 0.8 are considered extremely strong. To compare fit of nested models the chi-square difference test exhibiting a probability < 0.05 was used.

5.3 Field Study Analysis and Results

The previous sections detailed field study method. In the following sections the analysis of the data collected is reported. First, the description of the sample is presented. Next, the preliminary analysis of the data including the examination and treatment of missing data, outlier detection and treatment and the assumption check for SEM is reported. After careful preliminary examination of the data, results of the two-stage model estimation using structural equation modelling are presented. The examination reports the estimation of the measurement models for each of the theoretical constructs, followed by the multiple group confirmatory factor analysis of the structural model.

5.3.1 Sample Characteristics

The sample included 420 American residents with a gender split of 50% male and 50% female. Thirty five per cent were aged between 18 and 29, 40 % between 30 and 49 and 25% between 50 and 64 years old. The age quotas were calculated to approximately represent the proportions of age groups who own or use a tablet in the USA (Rainie & Smith, 2013). The majority of the participants indicated “four year college degree” as their highest level of education (29 per cent), followed by 28% “some college”, 16% “high school”, 12% “Master’s degree”, 11% “two year college degree”, 2% “professional degree”, 1% “doctoral degree”.

5.3.2 Preliminary Analysis of the Data

5.3.2.1 Missing data and outliers

No missing values were detected in the data collected for the field study¹⁶. The frequency distributions of z scores (e.g., $|z| > 3.00$ indicates an outlier) were examined to identify univariate outliers. The results identified 10 univariate outliers in the data set. Upon examination it was

¹⁶ Similar to the laboratory testing of the CPBI model in previous chapter, forced response option was used for all questionnaire items except for open-ended (respondents’ comments) questions. In essence, this function allows researchers to request a respond for an item before the respondent continues with the next item.

concluded that five out of 10 cases may well represent a valid element of the population. The other five observations were removed from the data set, resulting in $n = 415$.

Multivariate outliers were detected using Mahalanobis D^2 statistic (Kline, 2011). Seven multivariate outliers were detected (χ^2 distribution [$df = \text{number of variables}$], $p < 0.001$), which were removed from the data set. In total, 408 observations remained for further analysis.

5.3.3 Assumptions of SEM

5.3.3.1 Normality and linearity

Upon examination of normal Q-Q plots no severe univariate non-normality was detected visually. The calculated skewedness and kurtosis values were also all ≤ 1 and within the acceptable range of $|S/K| < 3$ (Kline, 2011; Hair et al., 2010). However, similar to laboratory study, the z -statistic for skewedness and kurtosis indicated that the data were non-normal ($|z| > 2.58$ at 0.01 significance level, c.f. Hair et al., 2010). The majority of the observed indicators were on the right side of the scale (≥ 4) and the distribution of the data were mainly negatively skewed. A few observed indicators were also platykurtic. Thus, similar to the laboratory CPBI model testing study, to adjust for distributional misspecification of the model, the “Bollen-Stine” bootstrap p incorporating 500 resamples (Arbuckle, 2012) was used and is reported for the measurement and structural models. To test for linearity, scatterplots of selected variables were chosen for examination [i.e., ‘spot check’ by Tabachnick and Fidell (2007)]. The visual examination of bivariate scatter plots confirmed the linear association between the variables in the dataset.

5.3.3.2 Homoscedasticity and multicollinearity

Similarly, visual examination of the scatter plots of data points for each variable indicated no unequal dispersion of variances. Additionally, the results of Levene’s test indicated the presence of homogeneity of variance (and absence of heteroscedasticity). Multicollinearity did not appear to be a potential problem, as all correlation values were below the recommended threshold of 0.90 (Bagozzi, 1994).

5.3.3.3 Sample size

The sample sizes used in the field study ($n = 408$) and used for sub-group analysis (Apple iPad Air: $n = 202$; Nokia Lumia 2520: $n = 206$) were above the threshold of 200 and were adequate for the analysis (Hoelter, 1983).

5.3.4 Common Method Variance Bias

Similar to the previous study (laboratory testing), the design of the questionnaire in the field study also followed the suggestions outlined in Podsakoff et al. (2003) to minimise any potential threat to validity. For example, measures of the constructs used different response formats (e.g., semantic differential scales for CPPI and Likert scales for CPBI). Also the information form and introductory pages assured respondents that the items had no right or wrong answers and that their responses would be anonymous. Harmon's one factor test, as recommended by Podsakoff and Organ (1986) was used to examine for common method variance bias. Using all of the items of all the latent variables, a single factor model was tested using CFA procedures. This model displayed very poor fit to the data ($\chi^2 [324] = 4749.610, p < 0.001$; CFI = 0.666; TLI = 0.639; RMSEA = 0.183; SRMR = 0.094), indicating that there is no general factor that accounts for the majority of the covariance across the variables.

5.3.5 The Measurement Model

Similar to the procedures followed in the laboratory study, a reflective specification of the variables was assumed. Measurement models were subject to CFA to ensure acceptable level of fit prior examining the structural model. The measurement models for five measured constructs including consumer perceived brand innovativeness (CPBI), consumer perceived product innovativeness (CPPI), technological newness (TN), brand attitude and purchase intention are discussed next. The reported p (s) is the "Bollen-Stine" bootstrap p incorporating 500 resamples (Arbuckle, 2012).

5.3.5.1 Consumer perceived brand innovativeness (CPBI)

The CFA results for the consumer perceived brand innovativeness measurement model are depicted in Figure 5.2. Two numbers are printed on each arrow. Left side numbers are factor loadings and right side numbers (close to the end of each arrow) are squared multiple correlations or item reliability. This scheme is consistent in all of the following figures.

Initially, the CFA results showed poor model fit statistics. Two fit indices did not meet the recommended thresholds. RMSEA was slightly above 0.08 and TLI were slightly less than 0.95. Because all items showed a good level of factor loading ($\beta > 0.5$) and reliability ($\lambda^2 > 0.5$) and there was no pattern of standardised residual greater than 2.54, all items were left unchanged. However, based on the modification indices and following Kline (2011) and Byrne (2010), one error correlation was added to the CFA model between two indicators of BI2 and BI3 to improve the fit of this initial model. Item BI2 measures dynamism and item BI3 measures being cutting-edge.

While dynamism defines rigorous development and progress, cutting-edge defines the most advanced stage of the development. Hence, it could be argued that BI2 and BI3 items are expressing slightly overlapping ideas (Byrne, 2010). In addition, both of these items were adapted from previous consumer perceived firm innovativeness scales (e.g., Henard and Dacin, 2010; Kunz et al., 2011) and with a minor modification they could be used to measure a related construct of consumer perceived firm innovativeness (Kline, 2011). In the revised model all fit indices conformed to the prescribed cut-off values.

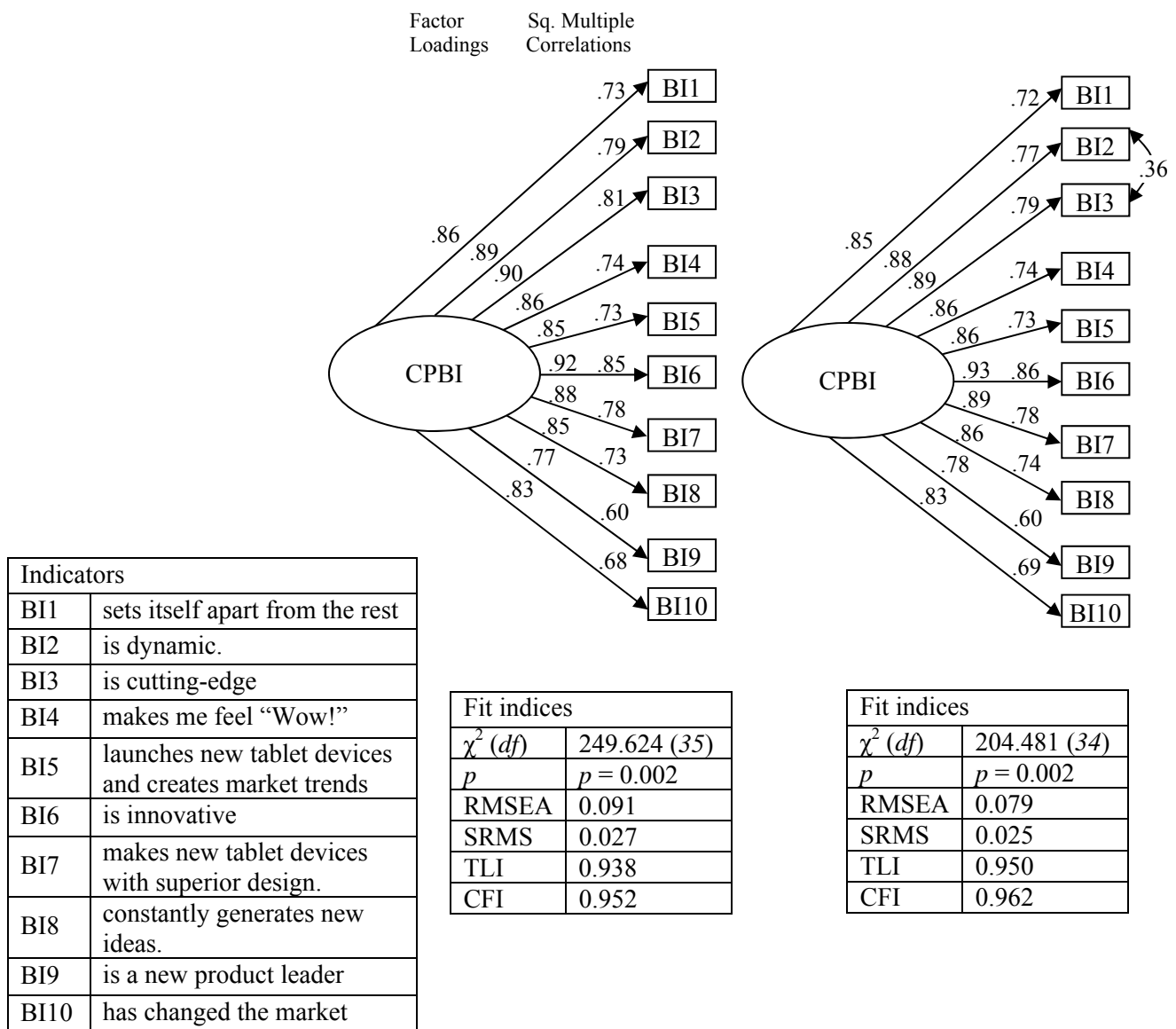


Figure 5.2 CFA on CPBI

5.3.5.2 Consumer perceived product innovativeness (CPPI)

The CFA results for the CPPI measurement model are depicted in Figure 5.3. Originally, the CFA results indicated poor model fit statistics with CFI and TLI less than the cut-off value of 0.95 and RMSEA value above 0.80. Because all items showed good level of factor loading ($\lambda > 0.5$) and reliability ($\lambda^2 > 0.5$) and there was no pattern of standardised residual greater than 2.54, all items were remained unchanged. However, to improve model fit, one error correlation was added to the CFA model, between PI5 and PI6, based on the modification indices. These two items measure excitement and trendsetting aspects of an innovation. Although they do not appear to be expressing a same idea, it can be argued that they could also measure another related construct of consumer perceived firm innovativeness (Byrne, 2010; Kline, 2011). Innovative firms are trendsetters in their market and they constantly excite consumers with their innovative activities (Kunz et al., 2011). The revised model resulted supported the data.

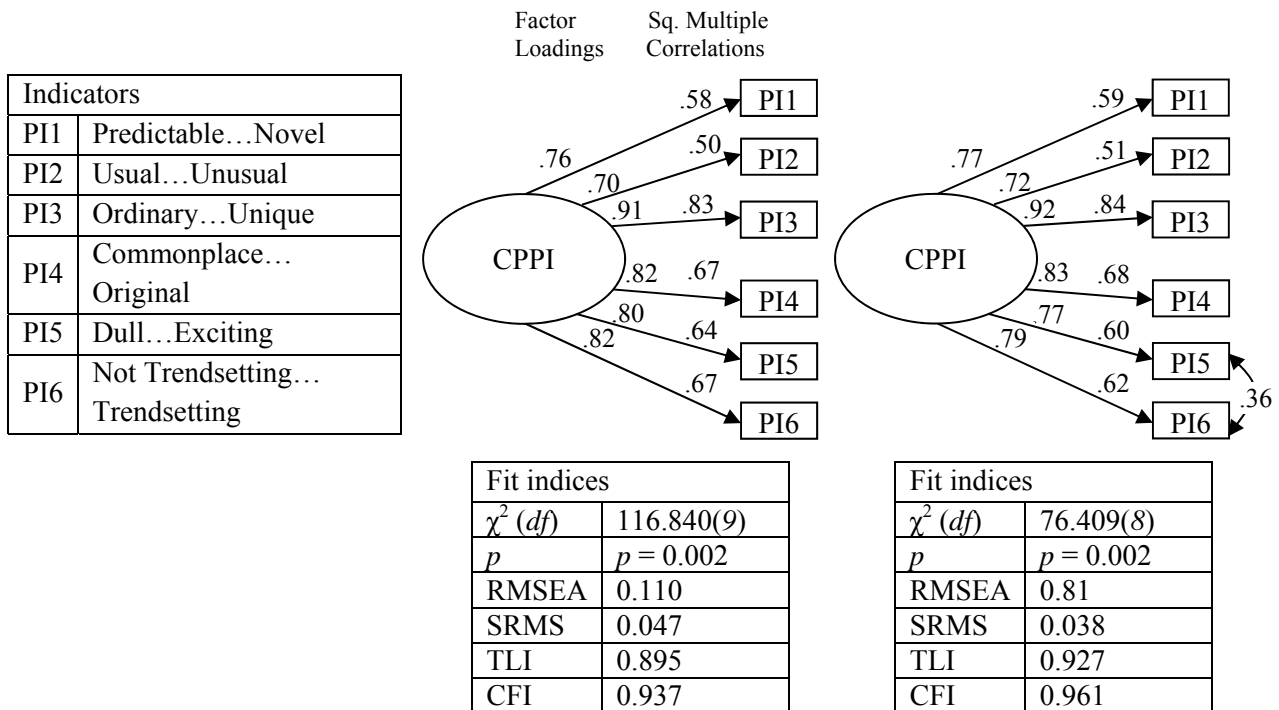


Figure 5.3 CFA on CPPI

As discussed in Chapter 4, the results of the CFA of the CPPI measurement model among Australians led to elimination of items PI5 and PI6 from the final CFA measurement model of CPPI. However, these two items seemed to work well among American consumers. It is important to note that measuring instruments are often group specific (here Australian and American consumers) in the way they operate (Byrne et al., 1989) and it is possible that these models may not be completely identical across groups (Bentler, 2005). Furthermore, the field study aimed at testing (1) the generalisability of the proposed CPBI model and (2) CPBI construct validity. Hence it was

conclusive that the observed factor structure difference for CPPI across Australian and American consumers neither caused a problem with the generalisability interpretations of the CPBI processing model across these two groups, nor it was problematic for testing the CPBI construct validity.

5.3.5.3 Technological newness

The CFA results for the technological newness measurement model are depicted in Figure 5.4. The results indicated a good fit of this model to the data.

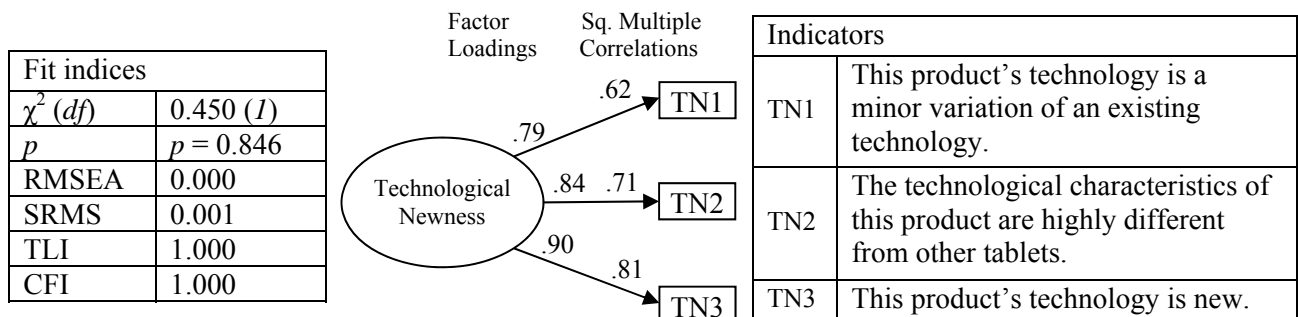


Figure 5.4 CFA on technological newness

5.3.5.4 Purchase intention

The CFA results for purchase intention measurement model are depicted in Figure 5.5. As illustrated in the figure, all fit indices and the parameter estimates for the model adhere to the prescribed cut-off values, confirming a good fit for the purchase intention measurement model.

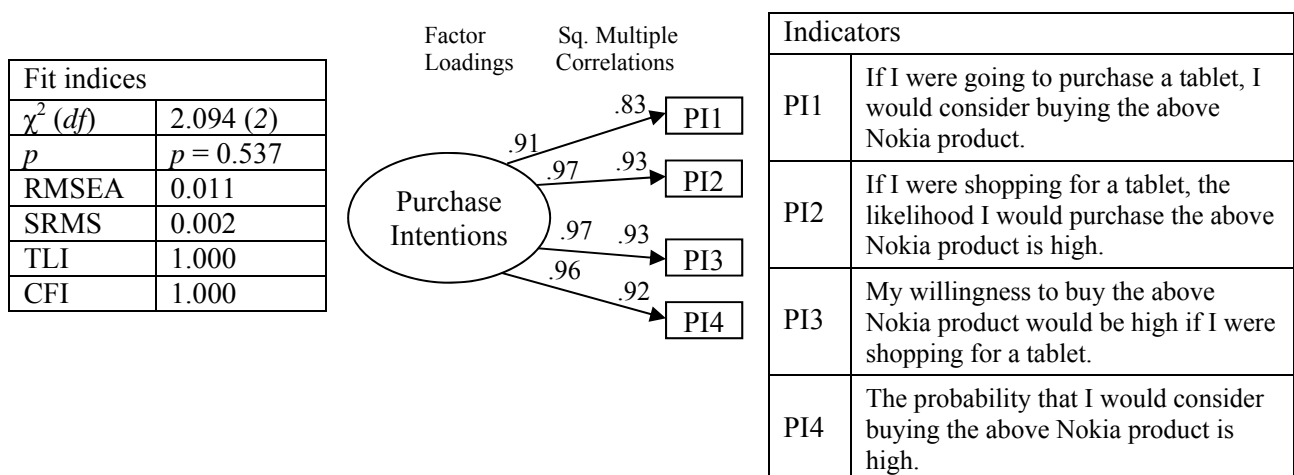


Figure 5.5 CFA on purchase intention

5.3.5.5 Brand attitude

Figure 5.6 shows the CFA results for the brand attitude measurement model. The results indicated adequate fit of the model to the data..

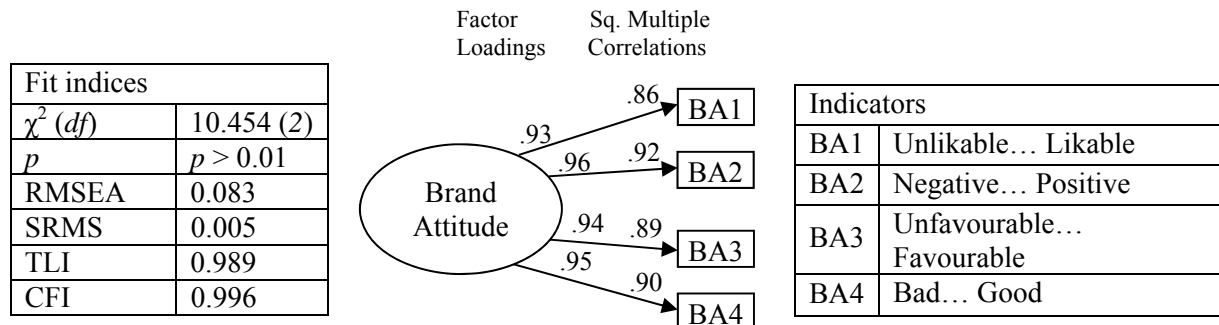


Figure 5.6 CFA on brand attitude

5.3.6 Reliability and Validity

Similar to the laboratory study, Cronbach's α , composite reliabilities (CR) and the average variance extracted (AVE) were calculated to examine scale reliability. The scale reliability of a construct is acceptable if Cronbach's α and CR exceed 0.80 (Hair et al., 2010; Raykov, 1997) and AVE is above 0.50 (Garver & Mentzer, 1999). The reliability scores for the above constructs are presented in Table 5.1. All reliability scores exceeded the recommended thresholds.

Table 5.1 Reliability statistics of the key constructs (*n* = 408)

Constructs	α	CR	AVE
Consumer perceived brand innovativeness	0.97	0.97	0.74
Consumer perceived product innovativeness	0.91	0.91	0.64
Technological newness	0.88	0.88	0.71
Purchase intention	0.97	0.97	0.90
Brand attitude	0.97	0.97	0.89

Similar to the procedures detailed in Chapters 2 and 4, a series of CFAs were conducted to examine discriminant validity among the key constructs of the model. Chi-square difference tests indicated that, in all cases, the fit for the two-factor model was significantly better than the fit for the single factor model ($\Delta df = 1$; $p < 0.001$), providing support for discriminant validity (see Table 5.2).

Table 5.2 CFA results for discriminant validity ($n = 408$)

Factors	Two-factor model		One-factor model		$\Delta\chi^2$	Δdf
	χ^2	df	χ^2	df		
TN and CPPI	157.466	26	211.503	27	54.037	1*
TN and CPBI	340.835	64	683.359	65	342.524	1*
TN and BA	28.527	13	437.858	14	409.331	1*
TN and PI	33.637	13	358.347	14	324.71	1*
CPPI and BA	163.826	34	1019.818	35	855.992	1*
CPPI and PI	158.235	34	974.186	35	815.951	1*
CPBI and CPPI	513.945	103	1321.481	104	807.536	1*
CPBI and PI	325.192	76	2033.793	77	1708.601	1*
CPBI and BA	366.801	76	1488.357	77	1121.556	1*
BA and PI	35.454	19	1440.628	20	1405.174	1*

Notes: * $p < 0.001$. TN = Technological newness; CPPI = Consumer perceived product innovativeness; CPBI = Consumer perceived brand innovativeness BA = Brand attitude; PI = Purchase intention.

5.3.7 The CPBI Scale Performance across Australian and American Consumers

The psychometric properties, reliability and validity of the measures utilised in the field study were established in the previous sections. Before testing the CPBI processing model, further evidence for the CPBI construct validity is provided in this section by testing the measurement equivalency of the proposed CPBI scale across Australian and American consumers. The data were subject to MGCFA following procedures detailed in Chapter 4. Results are provided below.

As detailed in Chapter 4, the CPBI measurement model indicated good fit to the Australian sample data (see Section 4.3.6.1 Consumer perceived brand innovativeness). Also this model resulted in good fit to the American sample data after inclusion of one error correlation in the measurement model (see Section 5.3.5.1 Consumer perceived brand innovativeness). The CPBI measurement model (with no correlated errors) was then subject to CFA for the pooled data (Australian and American samples, $n = 1025$). Results displayed good fit to the pooled data ($\chi^2 [35] = 168.165$, Bollen-Stine bootstrap $p > 0.001$, TLI = 0.985, CFI = 0.988, RMSEA = 0.061, SRMR = 0.013) with all fit indices above and within the recommended cut-offs. Hence, the CPBI measurement model with no correlated errors was determined as the baseline model for MGCFA. MGCFA was then conducted by fitting this CPBI model simultaneously across two groups of Australian and American samples. The fit statistics of this configural model were good ($\chi^2 [70] = 423.583$, Bollen-Stine bootstrap $p > 0.001$, TLI = 0.961, CFI = 0.965, RMSEA = 0.053, SRMR =

0.046). Thus, it was concluded that the pattern of the proposed unidimensional structure for CPBI was similar across Australian and American samples (Byrne, 2010).

Comparing the factor loadings of the CPBI measurement model for the Australian sample (reported in Figure 4.3) with their corresponding values for the American sample (reported in Figure 5.2) shows slightly different loadings for these groups (reported in Table 5.3). For example, it seems that BI9 factor loading is stronger for Australian consumers compared with American consumers (0.86 versus 0.77). To further analyse the equivalency of the structural paths across these two samples, a series of tests that constitutes invariance testing through MGCFA was conducted. Results for this MGCFA are reported in Table 5.4. Note that Table 5.4 does not include the test for equivalency of BI1 as this item was constrained for model specification.

Table 5.3 CPBI factor loadings

<i>Factor</i>		Pooled data	Standardised factor loadings	
			Australian sample	American sample
[Brand name] sets itself apart from the rest when it comes to [product category].	BI1	0.88	0.90	0.86
With regard to [product category], [brand name] is dynamic.	BI2	0.90	0.91	0.89
[Brand name] is a cutting-edge [product category] brand.	BI3	0.92	0.93	0.90
[Brand name] [product category] makes me feel “Wow!”	BI4	0.85	0.85	0.86
[Brand name] launches new [product category] and creates market trends all the time.	BI5	0.86	0.87	0.85
[Brand name] is an innovative brand when it comes to [product category].	BI6	0.92	0.91	0.92
[Brand name] makes new [product category] with superior design.	BI7	0.86	0.85	0.88
With regard to [product category], [brand name] constantly generates new ideas.	BI8	0.88	0.90	0.85
[Brand name] is a new product leader in the [product category] market.	BI9	0.82	0.86	0.77
[Brand name] has changed the market with its [product category].	BI10	0.81	0.80	0.83

Notes: All paths were highly significant at 0.001.

Table 5.4 Fit statistics for tests of factor loading equivalence

Model description	Comparative model	χ^2	<i>df</i>	$\Delta\chi^2$	Δdf
1. Configural model: no equality constrained imposed	–	423.583	70	–	–
2. Measurement model: All factor loadings constrained equal	2 versus 1	461.601	79	38.017	9*
3. Factor loading BI2 constrained equal.	3 versus 1	424.750	71	1.167	1 ^{ns}
4. Factor loadings BI2 and BI3 constrained equal.	4 versus 1	426.441	72	2.858	2 ^{ns}
5. Factor loadings BI2, BI3 and BI4 constrained equal.	5 versus 1	426.959	73	3.376	3 ^{ns}
6. Factor loadings BI2, BI3, BI4 and BI5 constrained equal.	6 versus 1	426.966	74	3.382	4 ^{ns}
7. Factor loadings BI2, BI3, BI4, BI5 and BI6 constrained equal.	7 versus 1	432.391	75	8.808	5 ^{ns}
8. Factor loadings BI2, BI3, BI4, BI5, BI6 and BI7 constrained equal.	8 versus 1	435.736	76	12.153	6 ^{ns}
9. Factor loadings BI2, BI3, BI4, BI5, BI6, BI7 and BI8 constrained equal.	9 versus 1	435.853	77	12.270	7 ^{ns}
10. Factor loadings BI2, BI3, BI4, BI5, BI6, BI7, BI8 and BI9 constrained equal.	10 versus 1	439.278	78	15.695	8* <i>p</i> = 0.047
11. Factor loadings BI2, BI3, BI4, BI5, BI6, BI7, BI8 and BI10 constrained equal.	11 versus 1	456.962	78	33.379	8* <i>p</i> = 0.000

Notes: *significant at 0.05; ns = not significant

Together, Tables 5.3 and 5.4 suggest that items BI1 to BI8 operate equivalently across Australian and American consumers ($p > 0.05$). However, factor loading of item BI9 for Australian sample ($\lambda = 0.86$) is statistically significantly different from this loading for American sample ($\lambda = 0.77$). BI9 indicates stronger correlation with CPBI in the Australian sample ($\Delta\chi^2 = 15.695$, $p < 0.05$). Also, factor loading of item BI10 for the Australian sample ($\lambda = 0.80$) is statistically significantly different from this loading for American sample ($\lambda = 0.83$). BI10 indicates stronger correlation with CPBI in the American sample ($\Delta\chi^2 = 33.379$, $p < 0.05$). More discussion of these findings is provided in Section 5.4.

5.3.8 The Structural Model

In this section, the replicability of the proposed CPBI model is tested by fitting the model on American sample data. Albeit, the generalisability of the model was tested for Hypotheses 1-4, excluding Hypotheses 5 and 6 (see Section 5.2 Field Study Method for details). The model is presented in Figure 5.7.

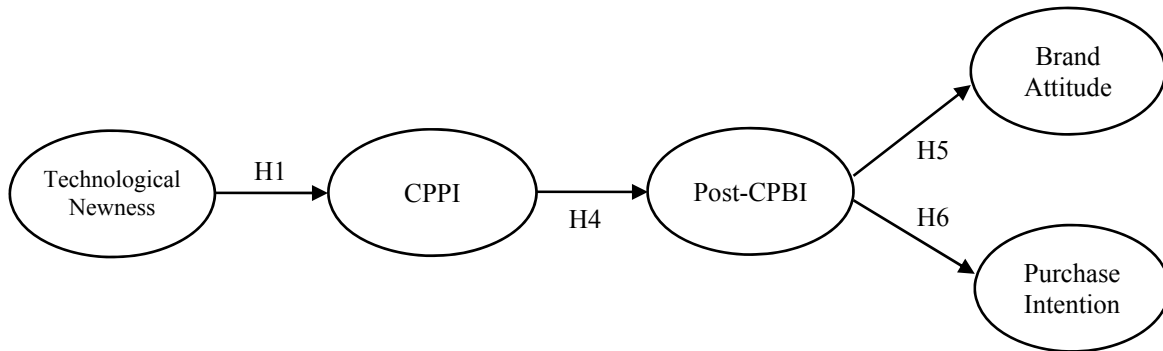


Figure 5.7 Consumer perceived brand innovativeness processing model

Notes: All arrows represent positive effects; CPBI = Consumer perceived brand innovativeness; CPPI = Consumer perceived product innovativeness.

5.3.8.1 Model fit assessment

The CPBI model displayed good fit to the data ($\chi^2 [317] = 948.711$, Bollen-Stine bootstrap $p > 0.001$, TLI = 0.947, CFI = 0.952, RMSEA = 0.070, SRMR = 0.075). The model explained a respectable portion of variance of the dependent variable CPBI (the phenomenon under investigation in this thesis) and dependent variable brand attitude. Specifically, the R^2 of CPBI was 56% and brand attitude was 65%. The model also explained a significant variance in consumer's purchase intention (49%).

5.3.8.2 Structural path assessment

The standardised path estimates for the field study along with their corresponding t -values are presented in Table 5.5. Results provide support for all of the hypotheses. In the hypothesised model, the technological newness – consumer perceived product innovativeness path (Hypothesis 1) is also positive, extremely strong (Hair et al., 2010) and statistically significant ($p < 0.001$, $\beta = 0.93$). Hypothesis 4 refers to the positive effect of the consumer's perception of a product innovation (CPPI) on his perception of its brand's innovativeness (CPBI). This strong effect is statistically significant ($\beta = 0.75$, $p < 0.001$) supporting Hypothesis 4. The CPBI – brand attitude path is positive and statistically significant ($\beta = 0.80$, $p < 0.001$) supporting Hypothesis 5 with a

strong effect (Hair et al., 2010). Hypothesis 6 is also supported as the CPBI – purchase intention path is positive and statistically significant ($\beta = 0.70, p < 0.001$, strong effect)¹⁷.

Table 5.5 SEM results for the hypothesised model

<i>Path</i>	β Laboratory	β Field	T values
TN → CPPI	0.86	0.93	15.709
CPPI → CPBI	0.24	0.75	13.953
CPBI → BA	0.84	0.80	18.849
CPBI → PI	0.46	0.70	15.386

Notes: All paths are positive effects and significant at 0.001; CPBI = Consumer perceived brand innovativeness; BA = Brand attitude; PI = Purchase intention; CPPI = Consumer perceived product innovativeness; TN = Technological newness. Number of distinct parameters to be estimated = 61 (26 regression weights, 3 covariances and 32 variances)

The total effects of antecedents on consumer perceived brand innovativeness are presented in Table 5.6. Compared to the results from the laboratory testing of the CPBI model, the field testing results produced higher total effects on the phenomenon of the interest (CPBI). Total effects suggest that a one standard deviation change in consumer perceived product innovativeness leads to 0.746 standard deviation change in the total effect it has on consumer perceived brand innovativeness. This effect was 0.238 in the laboratory testing. Likewise, a one standard deviation change in technological newness leads to a 0.697 standard deviation change in consumer perceived brand innovativeness. This effect was 0.204 in laboratory testing.

Table 5.6 Standardised total effects on CPBI

<i>Antecedents</i>	CPBI		
	Direct effect	Indirect effect	Total effect
Consumer perceived product innovativeness	0.746	0.000	0.746
Technological newness	0.000	0.697	0.697

Overall, the results support the generalisability of the proposed CPBI model, specifically the relationships hypothesised in H1, H4-H6.

¹⁷ Two effect sizes of CPPI-CPBI and CPBI-purchase intention are a bit higher than their corresponding effects in the laboratory study (CPPI-CPBI: 0.75 vs. 0.24; CPBI-purchase intention: 0.70 vs. 0.46). This is not surprising considering the fact that respondents exposed to a real brand-innovation pair in the field study compared with laboratory study when respondents had to imagine the new product innovation.

5.3.8.3 Model respecification

There has been an ongoing discussion about the best ways to test hypotheses and assess model fit in SEM. Some researchers argue that all statistical models are imperfect reflections of a complex reality; that is, they could be wrong to some degree (Humphreys, 2003; Kline, 2011; MacCallum & Austin, 2000). In fact, a well-fitted model does not imply that the model is correct or true, but only plausible (MacCallum & Austin, 2000). Steiger (2007) argues that values of fit statistics indicate only the *average* or *overall* fit of a model; it is thus possible that some parts of the model may poorly fit the data even if the value of a fit statistic seems favourable. Based on this reasoning, Kline (2011) suggests that all SEM models displaying either good or bad fit to data should be subjected to diagnostic investigation of model features that might need to be respecified in order to make the model consistent with the evidence.

Therefore, in an exploratory mode and with the focus on the detection of misfitting parameters in the originally hypothesised model, a series of successive specification searches was conducted following the procedures prescribed by Byrne (2010) and MacCallum (1986). In contrast to the results of laboratory testing of the proposed CPBI model, the modification indices (MIs) revealed a few evidences of misfit in the hypothesised model (Figure 5.7). Specifically, MIs suggested the paths from CPPI to purchase intention and brand attitudes to be freely estimated. Following Arbuckle (2012) and Byrne (2010), these two parameters were added to the model because (1) they were theoretically meaningful and (2) their expected parameter changes (EPC) were statistically substantial ($\beta \geq 0.2$). Because the estimation of MIs in AMOS is based on a univariate approach, it is critical that only one parameter is added at a time to the model as the MI values can change substantially from one tested parameterisation to another (Arbuckle, 2012).

The regression path following from CPPI to purchase intention indicated the highest MI value of 26.069 with EPC of 0.252. Given the theoretical meaningfulness of this relationship (see Section 5.4 Field Study Discussion for more details), the hypothesised model was respecified to structure model 2 by adding the CPPI – Purchase intention path to the model. Model 2 estimation indicated good fit to data ($\chi^2 [316] = 877.044$, Bollen-Stine bootstrap $p > 0.001$, TLI = 0.953, CFI = 0.958, RMSEA = 0.066, SRMR = 0.057). The incorporation of the regression path between CPPI and purchase intention made a substantial improvement to model fit ($\Delta\chi^2 = 71.667$, $p < 0.05$). Turning to the resulting MIs for model 2, it was found that the regression path related to CPPI and brand attitude remained a mildly misspecified parameter in the model (MI = 11.785, EPC = 0.118). Likewise, this relationship is theoretically meaningful. Thus, model 2 was respecified to structure model 3 by adding the CPPI – brand attitude path to the model. As expected, model 3 estimation indicated good fit to data ($\chi^2 [315] = 846.925$, Bollen-Stine bootstrap $p > 0.001$, TLI = 0.955, CFI = 0.960, RMSEA = 0.064, SRMR = 0.046). Similarly, the incorporation of the regression path

between CPPI and brand attitude made a substantial improvement to model fit ($\Delta\chi^2 = 30.092, p < 0.05$). To avoid overfitting the model and to meet the ever constant need for scientific parsimony, no more parameters were added to the model (Byrne, 2010; Wheaton, 1987). The final CPBI model that best fit American consumer data in the tablet product category is presented in Figure 5.8.

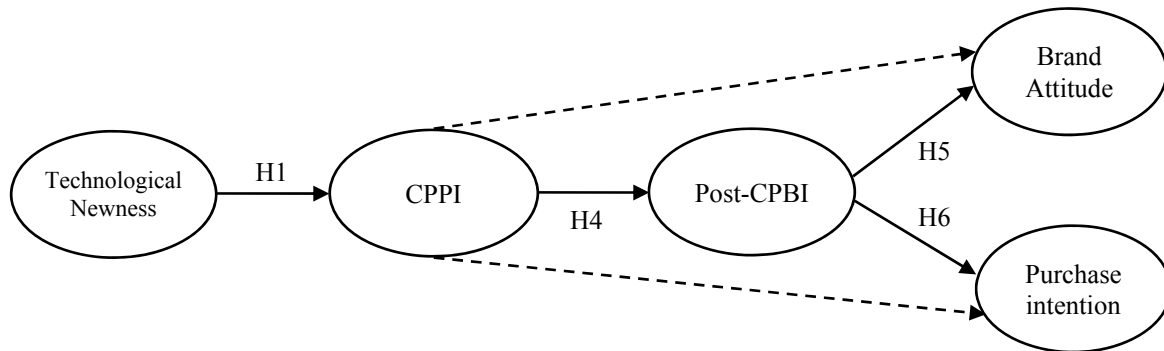


Figure 5.8 Consumer perceived brand innovativeness respecified model

Notes: All arrows represent positive effects; The dotted lines represent emergent relationships; CPBI = Consumer perceived brand innovativeness; CPPI = Consumer perceived product innovativeness.

The respecified model explained a respectable portion of variance of the dependent variable CPBI (the phenomenon under investigation in this thesis) and dependent variable brand attitude. Specifically, the R^2 of CPBI was 53% and brand attitude was 66%. Compared to the results of the hypothesised model (Figure 5.7) there is little change to the R^2 of CPBI (53% versus 56%) and brand attitude (66% versus 65%). However, the respecified model explained a higher proportion of the variance in consumer's purchase intention compared to the hypothesised model (59% versus 49%). The standardised path estimates for the above hypothesised and respecified models are presented in Table 5.7. Compared to the hypothesised model (Figure 5.7) the total effect of CPPI and technological newness on CPBI indicated a slight drop from 0.746 and 0.697 to 0.730 and 0.685, respectively.

Table 5.7 SEM results for the hypothesised and respecified models

<i>Path</i>	Standardised path estimates		
	Laboratory Study	Field Study	Respecified model
	AUS (<i>n</i> = 617)	USA (<i>n</i> = 408)	USA (<i>n</i> = 408)
	Mobile phone	Tablet	Tablet
TN → CPPI	0.86	0.93	0.94 (15.835)
CPPI → CPBI	0.24	0.75	0.73 (13.717)
CPBI → BA	0.84	0.80	0.59 (11.273)
CPBI → PI	0.46	0.70	0.31 (5.719)
CPPI → BA	-	-	0.28 (5.470)
CPPI → PI	-	-	0.51 (8.699)

Notes: All paths are positive effects and significant at 0.001; *t* values are in brackets; CPBI = Consumer perceived brand innovativeness; BA = Brand attitude; PI = Purchase intention; CPPI = Consumer perceived product innovativeness; TN = Technological newness.

5.4 Field Study Discussion

This study was aimed at testing the robustness of the proposed CPBI scale and the generalisability of the hypothesised CPBI processing model with a different product category, for real innovations and across different populations. Hypotheses 1, 4, 5 and 6 were retested using a cross-sectional design. Respondents were 408 American adults. The data were subject to SEM.

Results of MGCFA showed that the proposed unidimensional 10 item scale for the CPBI construct performs well for other samples such as American consumers. In addition, eight out of the 10 proposed items to measure CPBI (BI1-BI8) were found to perform equivalently across Australian and American consumers. Results indicated that while Australian consumers put more emphasis on the leadership aspect of brand innovativeness (BI9), for American consumers the ability to change the market (BI10) plays a slightly more important role. These two small differences are not surprising as measuring instruments are often group specific (here Australian and American consumers) in the way they operate (Byrne et al., 1989) and it is possible that these instruments may not be completely identical across groups (Bentler, 2005). Still BI9 and BI10 factor loadings for Australian and American samples (BI9: $\lambda_{\text{AUS}} = 0.86$, $\lambda_{\text{USA}} = 0.77$; BI10: $\lambda_{\text{AUS}} = 0.80$, $\lambda_{\text{USA}} = 0.83$) were all highly significant ($p < 0.001$) and all could be categorised as strong effects (Hair et al., 2010). Thus, it was conclusive that these slightly different operations for BI9 and BI10 across the two samples are negligible (Bentler, 2005; Byrne, 2010) and altogether, the field study provides further support for the construct validity of the proposed CPBI conceptualisation and operationalisation.

Regarding the CPBI model, results were similar to the laboratory study. The proposed CPBI model indicated adequate fit to the data. Results indicated that technological features of a new

product have a strong effect on consumers' evaluation of the product's innovativeness (Hypothesis 1). Also, a new product leads to an enhancement of consumer perceived brand innovativeness (Hypothesis 4). Finally, direct and positive relationships between consumer perceived brand innovativeness and brand attitude and purchase intention were found, providing support for Hypotheses 5 and 6.

The proposed CPBI model explained a substantial variance in the consumer perceived brand innovativeness construct. Thus, the field study provides support for the replicability and generalisability of the majority of the full CPBI model (four out of six Hypotheses) for real world situations and across Australian and American samples. It also provides an opportunity to evaluate cross-culturally some aspects of diffusion theory (Rogers, 2003) in marketing. One of the most important challenges for consumer behaviour research is extending the applicability of consumer theory to cover different countries and cultures (Goldsmith, d'Hauteville, & Flynn, 1998). Replicable models allow researchers to tie together the findings of different studies into a complex picture of consumer – innovative brand interactions.

Also, two additional relationships were identified in the post hoc analysis. The links presenting the effects of consumer perceived product innovativeness on brand attitude and purchase intention were added to the proposed CPBI model for their theoretical and statistical meaningfulness. The relationship between consumers' perceptions about product innovations and consumer purchase intention has been examined in previous studies (Alexander et al., 2008; Moreau et al., 2001). Previous studies also suggested product innovations as a potential driver of brand attitude (Aaker, 2007; Aaker & Jacobson, 2001). Recently, this effect was also empirically examined in other studies (Lowe & Alpert, 2013). Thus, the field study also extends the previous finding in this area.

Most importantly though, it could be argued that these two relationships put more emphasis on the strategic value of the brand innovativeness and its substantial effect on consumers attitude toward the brand and consumer purchase intention. As discussed in the method section, consumers evaluated CPPI of two recently introduced tablets; namely Lumia 2520 and iPad Air. Similar to what occurs in day to day life, the new product stimuli were presented with their parent brand name. Thus, it is very likely that consumers' evaluations of Lumia 2520 or iPad Air included their perceptions of *Nokia* Lumia 2520 or *Apple* iPad Air. Therefore, it is likely that these two relationships present the aggregate effect of brand–innovation pair on brand attitude and purchase intention.

Given the same condition in the laboratory testing of the CPBI model (brand name attached to the new product)¹⁸, one might wonder why these two relationships were not suggested as mis-specified in the results of the laboratory study model estimation. As reviewed in the previous chapter, the impact of pre-CPBI on CPPI was partially supported with a weak path estimate of 0.1. Apparently, consumers' perceptions of brand innovativeness were not fully transferred to their perceptions about the fictitious innovation. It was discussed that pre-CPBI might have had a significant influence on CPPI if participants had received promotional material featuring the brand–innovation pair on more than one occasion (see Section 4.4 Laboratory Study Discussion for more details). Thus, the brand–innovation pair for the fictitious innovation and the real brand in the laboratory study was not likely to be as strong as the brand–innovation pair for the real innovation and the real brand in the field study, which in turn resulted in (1) more clear distinctions between CPPI and CPBI in the laboratory study, (2) no misfit specification regarding the effect of CPPI on brand attitude and purchase intention.

The field study was limited in a sense that it did not replicate the proposed relationship between pre-CPBI and CPPI, leaving it open for future research to provide a stronger examination of this relationship. Still, from the preceding argument, the possibility of observing support for this relationship is high in more realistic situations such as the field study setting. Thus, in addition to the empirical support for the generalisability of a large proportion of the proposed CPBI model, results provide preliminary support for the effect of pre-CPBI on CPPI.

5.5 Conclusion

This chapter reported the methods, analyses, and findings of testing CPBI scale and model in a field study. As the final study in a series of studies examining CPBI, this investigation builds on earlier results suggesting the validity of the CPBI proposed scale and processing model. The contribution of this study is twofold. First, it provides additional evidence for the psychometric soundness of the CPBI scale. The cumulative evidence of this and previous studies shows that the scale performs well for both student and adult respondents, for both mobile phone and tablet product categories as target stimuli, and for Australian as well as American consumers. Second, the field study cross-validates the original results for the proposed CPBI processing model with a real world brand–innovation context. The next chapter provides a general discussion of the thesis, including an overview of results relating to each of the eight studies comprising the thesis and their implications for theory and practice.

¹⁸ To be able to test for the effect of pre-CPBI on CPPI and post-CPBI (Hypotheses 2-3), it was essential to include this brand name-product innovation pair in the stimuli.

6.1 Introduction

In the previous chapter, the CPBI processing model was examined and cross validated among American consumers. The results indicated the generalisability and replicability of the proposed CPBI processing model. In this chapter, the major findings of the previous chapters are discussed in terms of: (1) addressing the research questions, (2) theoretical contributions, (3) managerial implications, and (4) limitations and future research directions.

6.2 Thesis Research Questions and Summary of Findings

The overall objective of this thesis is to address a gap in the branding and innovation research relating to innovativeness at the brand level. The extraordinary growth of investment in creating and enhancing consumer perceived innovativeness and the need to consider branding principles in the study of innovativeness is well established (Di Benedetto, 2012). However, little attention has been directed toward understanding how consumers perceive innovativeness at the brand level, and gaining insight into its drivers and outcomes. The key aims of this thesis were to conceptualise and operationalise consumer perceived brand innovativeness (CPBI) and to examine the CPBI processing model by answering to the following research questions:

1. How do consumers perceive innovativeness at the brand level?
2. How do we measure consumer perceived brand innovativeness?
3. Do firms' efforts to launch product innovations lead to CPBI and if so, how does exposure to the innovation affect consumer evaluations of the brand's innovativeness?
4. What are the consequences of CPBI?

To answer these research questions, in a multi-method approach, eight studies across a total of 2015 respondents (990 students and 1025 adults) were conducted. Exploratory Studies A1 to A3 aimed to answer research question 1, Scaling Studies B1 to B3 addressed research question 2 and finally research questions 3 and 4 were addressed in two distinct laboratory and field studies. The summary of results for each study is provided below.

Exploratory Studies A1–A3. The CPBI conceptualisation was theorised based on (1) consumer perceived product, firm and brand innovativeness literature, (2) signalling theory (Spence, 1974) from information economics and (3) the associative network model of memory (Anderson, 1983). Next, using three different samples of university students, three qualitative studies were conducted to generate an enriched and more detailed understanding of what brand

innovativeness means to consumers. Data were collected using free association and open-ended elicitation techniques. The results indicate that innovative brands are related to several interesting core and secondary associations that have not been adequately addressed in previous research.

Specifically, Study A1 ($n = 100$) listed innovativeness-related brand associations and indicated that innovative brands elicit a number of unexpected and surprising associations (e.g., design, simplicity, fun, colour, fashion, stylish, clever, customisation and flamboyant) that have not been adequately captured in the extant literature on perceived innovativeness conceptualisations at the firm and the product levels. In Study A2 the first consumer perceived brand innovativeness concept map was generated using text analysis techniques performed on 103 documents (student sample, $n = 103$). The map shows core and secondary innovativeness-related associations linked to the brand innovativeness node. Results of Study A2 confirmed the results of Study A1 regarding the existence of some key core and secondary associations that are currently absent in the conceptualisation and operationalisation of innovativeness at the product and firm levels (e.g., colour, design and surprise). By subsequently cuing respondents with brand names rather than innovativeness as the stimulus, the results of Studies A1 and A2 were further confirmed in Study A3 ($n_3 = 83$, student sample). The qualitative findings of these three studies provided support for the CPBI conceptualisation and were used in developing the CPBI scale in scaling Studies B1 to B3 and the CPBI processing model.

Scaling Studies B1–B3. Using three different samples of university students, three quantitative studies were conducted to develop and validate the CPBI measurement scale. First, following established guidelines for measure development (e.g., Netemeyer et al., 2003), a total set of 18 items were generated and confirmed after extensive content analysis considerations. The CPBI factor structure was then explored and its unidimensionality was confirmed in Study B1 ($n = 300$, student sample). The final scale contained the following items:

- [Brand name] sets itself apart from the rest when it comes to [product category].
- With regard to [product category], [brand name] is dynamic.
- [Brand name] is a cutting-edge [product category] brand.
- [Brand name] [product category] makes me feel “Wow!”
- [Brand name] launches new [product category] and creates market trends all the time.
- [Brand name] is an innovative brand when it comes to [product category].
- [Brand name] makes new [product category] with superior design.
- With regard to [product category], [brand name] constantly generates new ideas.
- [Brand name] is a new product leader in the [product category] market.
- [Brand name] has changed the market with its [product category].

In Study B2 ($n = 255$, student sample) the discriminant validity of the CPBI scale was established vis-à-vis consumer perceived product innovativeness (CPPI) and consumer perceived firm innovativeness (CPFI) scales. Study B3 examined the predictive and comparative validities of the CPBI scale ($n = 150$, student sample). Consistent with theoretical expectations, the results indicated that CPBI positively predicted brand attitude, excitement toward the brand and consumer satisfaction. Study B3 also showed the superiority of the CPBI scale to the only currently available brand innovativeness scale developed by Eisingerich and Rubera (2010). The CPBI scale developed in this thesis explained substantially more variance in the dependent variables than Eisingerich and Rubera's scale. Together Studies A1 to B3 develop a unique and theoretically supported conceptualisation and operationalisation of consumer perceived brand innovativeness. The CPBI scale and the findings from these studies were used in theorising the CPBI processing model. This model was developed in Chapter 3, examined in a laboratory study and cross-validated in a field study.

Laboratory Study. Based on findings from exploratory and scaling studies, this study examined the proposed CPBI processing model, advanced in Chapter 3. The model is based on findings from the brand concept map study (Study A2), the concept specialisation model (Cohen & Murphy, 1984; Hampton, 1987; Murphy, 1988), information integration theory (Anderson, 1971, 1981a) and the associative network memory model (Anderson, 1984; Anderson & Bower, 1973). The CPBI processing model proposes that when consumers are exposed to a marketing stimulus such as an innovation, their current perception of the innovativeness level of the brand (pre-CPBI) and their perceptions about technological newness of the new product (TN) influence how they perceive product innovativeness (CPPI). Based on this perception and their current perception of brand innovativeness they make a judgement about brand innovativeness (post-CPBI). The resulted consumer perceived brand innovativeness will then positively impact brand attitude and consumer purchase intention. Six hypotheses among CPBI and its antecedents and consequences were developed:

- H1: Perceived technological newness positively impacts consumer perceived product innovativeness.
- H2: Pre-consumer perceived brand innovativeness positively impacts consumer perceived product innovativeness.
- H3: Pre-consumer perceived brand innovativeness positively impacts post-consumer perceived brand innovativeness.
- H4: Consumer perceived product innovativeness positively impacts post-consumer perceived brand innovativeness.
- H5: Post-consumer perceived brand innovativeness positively impacts attitudes toward the brand.

H6: Post-consumer perceived brand innovativeness positively impacts consumer purchase intention.

A 2 (technological newness: high vs. low) × 2 (pre-CPBI: high vs. low) randomised pretest–posttest mixed factorial design was adopted to test the proposed relationships. The CPBI scale developed through Studies A1 to B3 was used in this study. A total of 635 Australian consumers participated in the study, which was reduced to 617 cases after careful preliminary data analysis. The data were analysed using structural equation modelling (SEM). Five out of six hypotheses were fully supported and Hypothesis 2 (pre-CPBI on CPPI) was partially supported, completing the answers for research questions 3 and 4. In addition, the results provided nomological validity for the proposed CPBI scale developed in Studies A1-B3. The scale was found to perform well across student (Studies A1-B3) and non-student (laboratory study) samples.

Field Study. Extending the findings of previous seven studies, this study tested the generalisability of the proposed CPBI scale and the CPBI processing model in a different product category, using real innovations. A cross sectional design was adopted. A total of 420 American consumers participated in this study, which was reduced to 408 cases after careful preliminary data analysis. The data were analysed using structural equation modelling. In sum, results indicated that the proposed CPBI scale performed well across different populations, providing further support for CPBI construct validity. Moreover, the results of the laboratory study were successfully replicated for American consumers and real innovations in the tablet market, providing further support for the validity of the proposed CPBI processing model.

6.3 Theoretical Contributions

The main contribution of the present thesis lies in applying branding principles to innovation theory (Rogers, 2003), while simultaneously contributing to the branding theories (Aaker, 1991; Keller, 1993) by applying the concept of innovativeness from the consumer perspective. On a general level, this thesis recognises that much of the perceived innovativeness literature centres on the tangible impact that new product development initiatives have on outcomes of innovation (Henard & Dacin, 2010). Yet research investigations of the less tangible facets of innovation, such as CPBI, remain relatively unexplored despite brands' promise as a source of sustainable competitive advantage (Keller, 2013). This research contributes to the theory in several ways, discussed below.

6.3.1 Conceptualisation and Operationalisation of CPBI

The theoretical contributions of the thesis with regard to the conceptualisation and operationalisation of CPBI are as follows. An important implication for theory involves the

widespread application of the associative network memory model (Anderson, 1983; Anderson & Bower, 1973) as a theoretical basis for investigations of branding effects. This thesis provides the first conceptualisation of consumer perceived brand innovativeness based on the associative network memory model and signalling theory (Spence, 1974). The application of the associative network memory model is not a new one in the sense that it is now the dominant conceptual lens through which many researchers represent a brand in the mind of consumers. However, this research is the first to utilise the associative network memory model in the innovativeness context. Innovativeness studies have been criticised for lacking strong theoretical frameworks on which to base branding and innovation interactions (Di Benedetto, 2012). The present thesis stems from the perceived need to provide better theoretical explanations of branding and innovation linkage. The empirical test of the proposed CPBI conceptualisation provides firm evidence for the application of the associative network memory model as a robust theoretical foundation to approach innovativeness at the brand level and from consumers' perspective. Moreover, through the integration of signalling theory, the theoretically-grounded conceptualisation was built on two streams of literature to guide future research efforts. These theoretical perspectives represent complementary approaches to augment the prevailing memory-based conceptualisation of consumer perceived brand innovativeness.

The present research empirically argues for the importance of addressing both affective and cognitive dimensions of innovation consumption at the brand level. Specifically, the research found that perceptions of an innovative brand not only elicit associations of leadership in terms of technology and product level innovations, but also feelings of “wow” and surprise. Notably, this affective response to innovativeness does not appear to emanate only from the product (i.e., innovation in the technology)—it may also result from any marketing activity of the brand that signals innovativeness (such as eye-catching colours in the brand logo). Hence, this broader perspective of the experience of innovativeness at the brand level is another contribution to the current consumer perceived innovativeness literature.

Furthermore, associations such as colour and design were also found to be important contributors to CPBI. This finding expands the emerging literature on design-intensive innovations (within the product innovativeness literature) which examines the diffusion of non-tech innovations (Dell'Era & Verganti, 2011). Although “colour” was found to be one of the core associations in exploratory studies, the item to measure this association dropped from the final scale during scale development studies in scaling studies. The final scale includes an item to measure the importance of “design” which is a broader construct and subsumes “colour” as one of its contributing attributes (Bloch, Brunel, & Arnold, 2003).

The CPBI scale occupies the middle ground between the CPPI scales, which are product (technology feature) specific and thus miss the broader meaning of brands, and the CPFBI scales (Henard & Dacin, 2010; Kunz et al., 2011), which are aimed at measuring the aggregate consumer perceived innovativeness at the firm level that may include multiple brands, with different brands in different product categories. Finally the present study is among the first in the area of innovation research to offer an innovative brand concept map using the machine-learning-based text analysis program, Leximancer.

6.3.2 CPBI Processing Model

The theoretical contributions of the thesis with regard to the CPBI processing model are as follows. The CPBI processing model utilised two theoretical frameworks to argue for relationships between post-CPBI and its antecedents such as CPPI, technological newness and pre-CPBI; namely information integration theory (Anderson, 1981a) and the concept specialisation model (Cohen & Murphy, 1984). The application of these two frameworks drawn from cognitive psychology is a novel approach by which to examine consumer processing of innovativeness at the brand level. These theoretical frameworks are dominant in experimental psychology and linguistics, and recently have been used in a few studies in the brand naming strategy literature (e.g., Kumar, 2005; Jo, 2007, Park et al., 1996). The present thesis, however, extends their application to the study of innovativeness from the consumer perspective. Adoption of information integration theory and the concept specialisation model is therefore a useful lens through which to gain empirical understanding of the processing of consumer perceived innovativeness in a branding context, and may act as a useful guide for future research in the area.

Results suggest that, in an attempt to introduce a product innovation, both technological newness of the new product and the current innovativeness level of the parent brand (pre-CPBI) have direct effects on consumers' evaluation of product innovativeness (CPPI). These relationships were not addressed in past research and thus this thesis contributes to the consumer perceived innovativeness literature. They address a theoretical gap in the research in the sense that relatively little is known about how efforts to introduce product innovations lead to CPBI and, critically, if and how exposure to the innovation affects consumer evaluations of the brand.

Results confirming positive effects of consumer perceived product innovativeness (CPPI) on CPBI simultaneously contribute to two research streams of brand innovativeness and product innovativeness. Specifically, this finding adds to the scarce literature on brand innovativeness by introducing and examining the antecedent role of CPPI. It also expands the current research on consumer perceived innovativeness at the product level by distinguishing the concept of CPPI from the concept of CPBI and examining the consequent role of CPBI. Providing clear distinctions

between CPPI and CPBI is an important outcome because the broader conceptualisation of innovativeness at the brand level allows for a more complete picture of innovation adoption by emphasising not only the product features and technology but also the special meaning that a brand signals to the market in order to create the image of innovativeness.

Finally, the present research offers empirical support for a previously suggested relationship between brand innovativeness from the consumer perspective and brand attitude. For example, Aaker (2007) argued that brand innovativeness can positively impact a brand. The results also indicate a direct and positive relationship between CPBI and consumer purchase intention. This relationship has not been addressed in previous research; hence, this finding contributes to the growing brand innovativeness research stream. These two important findings confirm that CPBI influences and shapes both attitudinal and behavioural consumer responses.

6.4 Managerial Implications

This research also has practical relevance for marketing managers who are confronted with the difficulty of establishing an innovative image for their brands, and assessing consumers' perception of their innovative brand marketing activities.

6.4.1 Conceptualisation and Operationalisation of CPBI

In general, the present research may assist in the following managerial domains with regard to the proposed CPBI scale. First, as the result of exploratory and scaling studies has shown, to create the perception of brand innovativeness managers should focus on differentiating their brand by generating new ideas and launching innovations which incorporate advanced technology (new product features and functions) and/or superior design (new product language).

Incorporating branding principles in conceptualising perceived innovativeness signifies that consumers' perceptions of innovative brands go beyond those of technology-driven new offerings. In fact, success in building the image of innovativeness for brands such as Apple iPhones is based on a broad strategic approach to convey innovativeness to consumers not only through technological advances in each single innovation, but also through the use of innovation language (e.g., colour, design, name, feel and look, [Dell'Era & Verganti, 2011]) in all of its new offerings, advertising, marketing campaigns, websites and on-line activities. The rationale is that while it may be easy for competitors to imitate a brand's innovation on intrinsic attributes such as product features, differentiation on the basis of extrinsic cues such as image association through innovation is more likely to be cost-effective and durable.

Managers can also apply the newly developed and validated CPBI scale in practice to measure and track perceived brand innovativeness. As mentioned, though a company may think it is innovative and may actually be innovative in some ways, whether consumers perceive it as innovative can be another matter and must be measured directly. If the company is positioned on innovativeness, it needs a way to measure brand innovativeness perceptions in order to manage it on an ongoing basis. The CPBI measure provides that measurement tool. Alternative marketing program changes can be tested for their impact on the CPBI measure. Furthermore, the relative influence of CPBI on key outcomes (such as brand attitude, excitement toward brand, consumer satisfaction and purchase intention) in their industry could be tested, which in turn can be used to decide whether to continue with the current brand positioning on innovativeness or change it accordingly.

In addition, managers can apply the measure to compare different brands [product categories] of the firm to identify the most and least important CPBI contributors within the brand [product category] portfolio. For example, the CPBI of Samsung's mobile phones, TVs and laptops may lead to different values for each product category and can be used to examine the relative influence of each CPBI on overall consumer perceived firm innovativeness (CPFI). In a similar vein, comparisons of the focal brand vis-à-vis other brands within the same product category (e.g., Samsung mobile phones versus Apple iPhone) would help managers to better understand their actual level of innovativeness perceived by consumers in the marketplace.

The measure could also be particularly useful in longitudinal studies aimed at tracking changes in CPBI scores over time. Managers could evaluate CPBI before launching the innovation, immediately after launching the innovation and at appropriate time intervals afterwards (e.g., every four months). If, over time, there is a significant drop in CPBI, the management team could be alerted to take appropriate action. Because of the CPBI scale's ease of administration and parsimony, these longitudinal studies could include other competitive brands as well to elicit a more comprehensive understanding of the brand's innovative activity within the marketplace and over time.

Moreover, CPBI can be used as brand development tool to pre-test measure the perceived innovativeness of a new brand the firm is launching, so that a firm positioning on innovativeness can better ensure that its new brand will score high on perceived innovativeness. Furthermore, CPBI could be a useful new product development tool. A company positioned on innovativeness would want the new products it launches to contribute to its CPBI. Potential innovations could be tested for their impact on CPBI. For example, softer innovations such as design-focused new products could be tested. New product managers need to pay greater attention to design elements

such as colour, ease of use and simplicity (Hanna, 2012). These attributes are effective in conveying innovativeness without relying on cutting-edge technology features (Dell’Era & Verganti, 2011).

Finally, brand managers should take into account both hedonic and cognitive consumption of innovations and the needs that their brands satisfy when selecting the most effective communication message and communication medium. Although the CPBI measure was not directly tested with marketing communications, it would make sense that advertisements or any form of marketing communications could be tested for its effect on CPBI. In particular for a brand positioning on innovativeness, it would want its marketing communications to have a positive effect on CPBI. For instance, while print or even informational TV advertisements may be more effective to satisfy cognitive needs (product specific features and functionality), marketing communications messages that focus on the pleasure of acquiring and associating with the brand could be applied to arouse consumers and make them feel “wow”. The latter may be conveyed more effectively with experiential marketing, fun, creative TV, or viral advertisements (Vandecasteele & Geuens, 2010). This message content should be aimed at making associations such as “fresh ideas”, “surprise”, “being different”, “superior design”, “dynamism” and “advanced technology” more salient in communications.

6.4.2 CPBI Processing Model

Regarding the proposed CPBI processing model, this research may assist in the following managerial domains. The way to raise CPBI is through more and bigger product innovations. The higher the technological newness of the new product, the higher the resulting CPPI and CPBI. Managers’ intuition that higher CPPI should lead to higher CPBI is now empirically supported, providing more confidence for, and lending greater weight to, focusing effort on more and bigger innovations. Generally speaking, if a brand wants to raise its CPBI, more and bigger CPPI is the path. If a start-up brand wants to be perceived as highly innovative, a highly innovative first product is the way to go. The reverse logic also holds that if a product-oriented or engineering-oriented start-up has just launched a highly innovative product, its advertising agency might consider positioning the brand as highly innovative to take advantage of the likely high CPBI.

Furthermore, support for the positive impact of CPPI on post-CPBI suggests that the cost of developing a new product does translate to an intangible asset of a richer innovativeness-related association network for the brand. This enhancement is larger for less innovative brands than for highly innovative brands and for highly technologically new products than for less technologically new products (see Section 4.4 Study B1 Discussion for details). In other words, introducing the same product innovation, a less innovative brand would benefit more in terms of brand

innovativeness enhancement and generally it is better to launch a highly technologically new product.

Finally, there is strategic value in being perceived as an innovative brand. Consumer perceived brand innovativeness enhances two important outcomes; brand attitude and consumer purchase intention. In addition to the strategic and objective value of purchase intention, brand attitude helps predict future earnings and thus firm value (Aaker & Jacobson, 2001). Thus, building an innovative image for a brand is a fruitful accomplishment and efforts to convey this image to consumers are worthy of investment.

Focusing on the product innovation itself, it seems that consumers' evaluation of product innovativeness (CPPI) is mainly built on their perception about the newness of the innovation's technology while the current level of brand innovativeness (pre-CPBI) has a smaller and partial effect on the formation of CPPI. For a new product to be perceived as innovative, highly innovative brands cannot and should not merely rely on their reputation for innovativeness, hoping for their brand innovativeness image to strongly transfer to their products. Their higher level of brand innovativeness may not necessarily lead consumers to evaluate their offering as an innovation. Thus, careful attention should be paid to the new product development. This point is exemplified by the following account: *"I would not buy a product just because it is an Apple brand. I would have to like it myself and find it useful to me"* (Respondent 126). However, this is not the case for less innovative brands for which the innovativeness image of the parent brand is more likely to impact consumers' evaluation of the product innovativeness. Thus, the new product launched by a less innovative brand is very likely to be evaluated less innovative. In dealing with this situation, brand managers should understand the possible image transfer from their brand to the new product which may negatively affect CPPI. Brand managers of low innovative brands need to decide whether to invest in a less technologically new product or try to push boundaries and aim at a highly technologically new product. As stated by the Director of *Incite*¹⁹ *"just because you can make it [introduce a new product], you should think twice about whether you should"* (Thomas, 2008)²⁰.

It is important to note that generalisation of the above implications has to be made with caution. Specifically, these implications are most applicable in technology-based consumer electronic products.

¹⁹ *Incite* is a strategic market research consultancy headquartered in central London and own by the St Ives Group.

²⁰ For the effect of pre-CPBI on CPPI the above implications are mainly based on the findings of the laboratory study, reported in Chapter 4. Note that due to design limitations it was not possible to replicate this relationship in the field study (see Section 5.2 Field Study Method). As discussed (see Section 4.4 Laboratory Study Discussion) and speculated before (see Section 5.4 Field Study Discussion), it is very likely to find full and stronger support for this relationship in the real world situations.

6.5 Limitations and Future Research Directions

Because this thesis represents one of the first systematic studies of consumer perceived innovativeness at the brand level, it possesses several limitations. However, as one of the first attempts in this area, I believe that the findings of this thesis generate substantial opportunities for further research. Specific limitations of each phase of the research program (exploratory and scaling Studies A1-B3, laboratory study and field study) have been already outlined in the chapters relating to them. Thus, in this section the limitations pertaining to the overall thesis are outlined.

6.5.1 Conceptualisation and Operationalisation of CPBI

The main purpose of the new measure of CPBI is to provide an assessment of how innovative a brand is in the mind of consumers. However, it is not sufficient for analysing whether the company has targeted “motivated” consumers (i.e., individual differences in responsiveness to brand innovativeness), which is a related issue in the consumer innovativeness literature (Vandecasteele & Geuens, 2010). Exploring the relationship between consumer innovativeness and CPBI would be of interest.

The CPBI scale as a general perceptual measure does not provide explicit guidance as to specific product features to integrate into the development of a new product. In this regard, and to improve the diagnostic capabilities of the CPBI measure, future research could consider how an attribute-based analysis of CPPI could complement the developed CPBI measure. For example, the effect of different prototypes (with different product design features)—which have been measured by attribute-based methods—on CPBI could be examined.

CPBI is conceptually distinct from other possible innovation-related constructs such as corporate reputation. Corporate reputation has been defined as “the overt expression of a collective image about a person or other entity, in a stakeholder or interest group” (Bromley, 2001, p. 317). It is based on a stakeholder’s perception of the organisation (Roper & Fill, 2012) and their shared value system (Walsh & Beatty, 2007). It indicates how well the company has done from the perspectives of its stakeholders and the marketplace (Davies, Chun, Da Silva, & Roper, 2003; Roper & Fill, 2012). Corporate reputation is typically investigated through managers’ and employees’ self-reported scales while CPBI in the present thesis focuses on consumers. A customer-based reputation scale has been developed that focuses on consumers (Walsh & Beatty, 2007) and evaluates reputation including several dimensions such as social responsibility, customer orientation and financial strength, but barely focuses on innovation. Thus, corporate reputation can be seen a broader construct that includes aspects of CPBI. Future research is invited to directly investigate the relationship between CPBI and corporate reputation.

The CPBI scale was developed and validated in the mobile phone and tablet categories. While it is not expected that other product categories would result in a different CPBI scale, future research is invited to test the viability and generalisability of the proposed scale across various product categories. Another potentially fruitful research avenue would be to combine projective eliciting techniques such as collage (Zaltman, 1997) with free association and story writing methods to retrieve more in-depth and unconscious brand knowledge. While it is not expected that these approaches would result in a meaningfully different CPBI scale, in-depth brand knowledge would be helpful for identifying possible differences between CPBI(s) in different product categories for the parent brand (e.g., Samsung mobile phones versus Samsung laptops).

6.5.2 CPBI Processing Model

The present thesis examined relationships between technology-based product innovations and innovativeness perceptions of the brand. Design-based innovation development and adoption literature is becoming increasingly important (Dell’Era & Verganti, 2011). It has been found that the aesthetic and symbolic dimensions of a product are becoming increasingly pertinent to a company’s success and relevant to consumer choices (Bloch et al., 2003). To gain a more complete picture of the relationship between CPPI and CPBI, future research may consider replication of the present research in design-intensive industries.

In addition, in the present thesis the nomological net particularly of antecedents, is narrow which may narrow the generalisability of the results because other possible causes are not measured and therefore cannot be ruled out. Thus, the opportunity remains to continue examination of CPBI and its interesting relationship with other factors that may contribute to the formation of brand innovativeness. Specifically, the importance of brand naming strategies (e.g., brand extensions, sub-brands and co-branding) in influencing consumer perceptions of innovativeness of a brand has been acknowledged by branding scholars (Aaker, 2007). It has been claimed that co-branding exists to persuade consumers of the advantages of a new product (Rao & Ruekert, 1994) and the use of co-creation and collaborative strategies for new product development is growing rapidly (Bouten et al., 2011). Given the degree of commitment associated with such partnerships, a more precise understanding of the impact that this strategy has on the CPBI of each parent brand would likewise yield valuable practical insights.

The present thesis chose to study two main outcomes of CPBI, namely brand attitude and purchase intention. Brand attitude served to examine consumer attitudinal responses, while purchase intention examined the behavioural dimension of the consumer response. Several other consumer response variables may be considered for future research such as consumer perceived product quality, consumer loyalty, brand credibility, brand equity and CPFI (consumer perceived

firm innovativeness). A deeper understanding of these relationships not only would prove beneficial to consumer behaviour researchers; it also holds significance for marketing and product managers. By understanding the impact CPBI may have, managers could then begin to investigate how to build CPBI to achieve a desired consumer response. Furthermore, future researches are invited to study the relationships among the three related constructs of CPPI, CPBI and CPFI simultaneously in a single model. Perhaps this would help in improving (re-specifying) the measure of consumer perceived firm innovativeness by allowing it have more items specialised to the firm level (since CPBI already measures the brand level).

The proposed CPBI processing model in this thesis was tested for two product categories; mobile phones and tablets. While there is no theoretical indication that the results will not extend to other product classes, the generalisability of the findings might be limited to technology-based consumer electronic products. Future research is invited to test the generalisability of the proposed model for other product categories and services.

New to the world brand names do not have any established brand association networks. For these brands, pre-consumer perceived brand innovativeness is not really meaningful. Thus, the application of the proposed CPBI processing model tested in the laboratory setting is limited to the established brand names. However, the majority of the model tested in the field study for real product innovations, brand names and American consumers is likely to be generalisable to non-established brand names.

Finally, as justified in Chapter 1 the thesis chose post-positivism as the most appropriate research paradigm to test the research hypotheses. Re-testing the proposed CPBI model using other research paradigms might result in a more complete picture of how consumers perceive, process and respond to brand innovativeness. For example, in contrast to positivism approach, *constructivism* believes that there is no objective external reality and in interaction with the phenomenon human beings construct and attach meanings to it (Sandberg, 2001). According to this approach, in order to know the process of interpretation the researcher must understand the meaning of the phenomenon in the context in which it occurs (Lincoln & Guba, 2011). Therefore, future research may re-test the proposed hypotheses using case study research method to develop an in-depth analysis of CPBI within a real life context (Denzin & Lincoln, 2012). Case study method can effectively address the “how” and “why” research questions (Yin, 2011).

6.6 Overall Conclusion

In conclusion, as a very new and under-explored area of inquiry within the branding and innovation adoption literatures, there is a crucial need for a deeper understanding of how consumers perceive and process innovativeness at the brand level. To this end, this thesis aimed to extend the

knowledge in the brand innovativeness field both conceptually and empirically. Several important gaps in the extant consumer perceived innovativeness literature and subsequent research questions were identified in Chapter 1. Building on a comprehensive literature review, the associative network model of memory and signalling theory, consumer perceived brand innovativeness (CPBI) was conceptualised in Chapter 2. The thesis provides a unidimensional 10-item scale for measuring CPBI which was developed and validated in exploratory and scaling studies (Studies A1 to B3), Chapter 2.

Based on these findings, in Chapter 3, the CPBI conceptual model was developed to demonstrate the processes that may be undertaken by consumers when exposed to an innovation by a brand. Six hypotheses were subsequently advanced and initially validated based on findings from the brand concept map study (Study A2), the concept specialisation model (Cohen & Murphy, 1984; Hampton, 1987; Murphy, 1988), information integration theory (Anderson, 1971, 1981a) and the associative network memory model (Anderson, 1984; Anderson & Bower, 1973). The proposed CPBI model was then tested for the mobile phone category, using an Australian sample in Chapter 4. Results provided support for all of the hypotheses. Finally, the replicability and generalisability of the findings were further established in Chapter 5 by examining four out of six hypotheses in the tablet category using American consumers. Results provided support for the generalisability of the model. In sum, firms' efforts to launch product innovations lead to CPBI. In an exposure to a product innovation, two factors affect consumer evaluations of the brand's innovativeness; namely, technological newness of the product innovation and CPBI prior to the introduction of the innovation. These factors lead to an enhancement of CPPI and the resulting CPPI positively impacts CPBI. The system of relationships ends with the enhancement of brand attitude and purchase intention. A comprehensive discussion of the research findings has been presented in this chapter, as have been limitations and future research directions.

Research on innovation antecedents and outcomes has applications to several disciplines' literature streams, such as literature on consumer behaviour, financial management and operational strategy, to name a few (Henard & Dacin, 2010). The findings in the present research point to the impact that technological newness, consumer perceived product innovativeness and pre- CPBI can have in CPBI formation, as well as CPBI's role in attitude formation and purchase intention, among other effects. As one of the first empirical studies to examine consumer perceived brand innovativeness, this thesis indicates that both innovation research and brand management can benefit from a consumer-centric, broad-based brand perspective (compared to a narrow perspective centred on product innovativeness).

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Appendices

Note that this section includes the sample questionnaires used in this thesis, with focus on the content of the each questionnaire. The formatting for these questionnaires were slightly changed to fit the thesis format style. The actual surveys were also printed on the UQ Business School letter head.

Appendix A: Conceptualisation of CPBI – Studies A1 to A3

Appendix A.1 Sample Questionnaire for Study A1

Understanding Brands
QUESTIONNAIRE

Thank you very much for agreeing to participate in this study. The survey aims to explore your perceptions of brands. Your answers are very valuable and will help us to better understand consumer decision-making. This study is not sponsored by any commercial organisation. The project is being conducted as part of a University of Queensland research program. Completing the survey should take approximately 5 minutes. Please note that by completing this questionnaire, you demonstrate your consent to take part in this study. This questionnaire consists of one section. Please note that:

- There are no right or wrong answers to these questions.
- We are not testing your knowledge.

Section 1

Please tell us what comes to your mind when you think of an innovative brand in a specific product/service category (for example Yamaha Pianos). Please provide your list of characteristics that you associate with an innovative brand in the space provided below (at least 2 characteristics). Please write the words as clearly as possible, and do not worry if you are not sure how to spell a word. Spell it as best as you can.

- | | |
|----------|----------|
| 1) | 3) |
| 2) | 4) |
| | 5) |

The following information is required for the purpose of the study only. It will remain confidential.

Are you male or female?

- Female Male

How old are you?

Thank You!

Appendix A.2 Sample Questionnaire for Study A2

Understanding Brands QUESTIONNAIRE

Thank you very much for agreeing to participate in this study. The survey aims to explore your perceptions of brands. Your answers are very valuable and will help us to better understand consumer decision-making. This study is not sponsored by any commercial organisation. The project is being conducted as part of a University of Queensland research program. Completing the survey should take approximately 10 minutes. Please note that by completing this questionnaire, you demonstrate your consent to take part in this study. This questionnaire consists of one section.

Please note that:

- There are no **right or wrong** answers to these questions.
- We are **not testing** your knowledge. We are **only interested** in your thoughts.

Section 1

Step 1

Please take a moment to think about a brand that you might consider **innovative**.

Write the name of the innovative brand here _____

Step 2

Please share your views with us by writing a few paragraphs about the above innovative brand, in the space provided on the next page with reference to the following questions:

- What comes to your mind when you think about an innovative brand?
- How would you describe an innovative brand?
- Why do you think some brands are more innovative than other brands?

Please write the words as clearly as possible, and do not worry if you are unsure how to spell a word. Spell it as best as you can.

(CONTINUE ON BACK)

The selected brand is innovative because...

The following information is required for the purpose of the study only. It will remain confidential.

Are you male or female?

Female

Male

How old are you?

Thank You!

Appendix A.3 Sample Questionnaire for Study A3

Understanding Brands QUESTIONNAIRE

Thank you very much for agreeing to participate in this study. The survey aims to explore your perceptions of brands. Your answers are very valuable and will help us to better understand consumer decision-making. This study is not sponsored by any commercial organisation. The project is being conducted as part of a University of Queensland research program. Completing the survey should take approximately 10 minutes. Please note that by completing this questionnaire, you demonstrate your consent to take part in this study. This questionnaire consists of three sections.

Please note that:

- There are no **right or wrong** answers to these questions.
- We are **not testing** your knowledge. We are **only interested** in your thoughts.

Section 1

In Section 1, you will see a list of words, each of which has a blank next to it. **Your task will be to write in each blank the first word you think of that means the same thing as or is strongly associated with the word on the paper.** There are no right or wrong answers. For example, if the word were “SKY”, you might write “EMIRATES”. If the word were “BEAUTIFUL”, you might write “CAT” or “PUPPY”. The proper way of indicating this word is:

SKY	<u>EMIRATES</u>
BEAUTIFUL	<u>CAT</u>

Be sure to print your words as clearly as possible, and do not worry if you aren't sure how to spell a word. Spell it as best as you can. Work as fast as possible, and be sure to write only a single word in each blank.

(CONTINUE ON BACK)

Section 1 Continued

1. IDEA _____
2. CLIMB _____
3. EMOTION _____
4. APPLE _____
5. BILLABONG _____
6. DESIGN _____
7. OCEAN _____
8. SIMPLE _____
9. WANTS _____
10. GOLF _____
11. SPEEDO _____
12. ELITE _____
13. HIGH SCHOOL _____
14. USEFUL _____
15. IKEA _____
16. COLOUR _____
17. BRACELET _____
18. TOYOTA _____
19. HEINZ _____
20. LOUIS VUITTON _____
21. RAIN _____
22. COCA COLA _____
23. PERFUME _____
24. VOLKSWAGEN _____
25. TECHNOLOGY _____

Blank Page: Please attempt the questions in Section 2, only after completing the questions in Section 1.

Section 2

For the following questions, please print your words as clearly as possible, and do not worry if you aren't sure how to spell a word. Spell it as best as you can. Work as fast as possible, and be sure to write only a single word in each blank.

(i) Please tell us what comes to your mind when you think of:

Louis Vuitton. You may list as many as six words.

1. _____ 2. _____
3. _____ 4. _____



(ii) Please tell us what comes to your mind when you think of:

Apple. You may list as many as six words.

1. _____ 2. _____
3. _____ 4. _____



(iii) Please tell us what comes to your mind when you think of:

Speedo. You may list as many as six words.

1. _____ 2. _____
3. _____ 4. _____



(iv) Please tell us what comes to your mind when you think of:

Coca Cola. You may list as many as six words.

1. _____ 2. _____
3. _____ 4. _____



(v) Please tell us what comes to your mind when you think of:

Toyota. You may list as many as six words.

1. _____ 2. _____
3. _____ 4. _____



(CONTINUE ON BACK)

Section 3

The following information is required for the purpose of the study only. It will remain strictly confidential. It will NOT be disclosed to any other party.

Are you male or female?

- Female Male

How old are you?

Thank You for participating in this survey!

Appendix B: Operationalisation of CPBI – Studies B1 to B3

Appendix B.1 Sample Questionnaire for Expert Panel

Operationalising Consumer Perceived Brand Innovativeness

Dear Expert,

Thank you very much for agreeing to participate in this study. This survey aims to test the content validity and item representativeness of consumer perceived brand innovativeness (CPBI). CPBI is defined as “consumers’ perception of a brand’s track record of product innovations, degree of creativity, and potential for continued innovative activity in the future in a given market”.

You will find the list of potential 30 CPBI measurement items²¹ along with a space for each item to be filled out by the experts in the next page. Please comment on the items according to their representativeness. If the items are not representative or do not make sense, please print not representative at all. Please also indicate if you agree with the item wording and clarity. If you would like to suggest rewording, please write your suggestion in front of each item. Please write any additional items at the end of the questionnaire.

To facilitate the process of evaluation, please consider a brand name in a specific product category and read the item wordings based on your selected brand name [product category] such as Samsung mobile phones, or Toyota cars or any other example that you feel comfortable with. For example, to evaluate the item “[Brand name] is a new product leader in the [product category] market”, you may read it as “Samsung is a new product leader in the smart phone market.”

(CONTINUE ON THE NEXT PAGE)

²¹ The final 10 items of CPBI scale are presented in this sample questionnaire. The full list of item pool is available upon request.

Potential measurement items for consumer perceived brand innovativeness

Expert's Comments

	Item representativeness	Item Clarity	New wording suggestions
[Brand name] launches new [product category] and creates market trends all the time.			
[Brand name] is a new product leader in the [product category] market.			
[Brand name] sets itself apart from the rest when it comes to [product category].			
[Brand name] is an innovative brand when it comes to [product category].			
With regard to [product category], [brand name] is dynamic.			
[Brand name] is a cutting-edge [product category] brand.			
[Brand name] has changed the market with its [product category].			
[Brand name] makes new [product category] with superior design.			
[Brand name] [product category] makes me feel "Wow!"			
With regard to [product category], [brand name] constantly generates new ideas.			

Please write your additional items in the space provided below.

	Additional Items
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Thank you for participating in this study!

Appendix B.2 Sample Questionnaire for Practitioner Panel

Brand Innovativeness Study

Dear Expert,

Thank you very much for agreeing to participate in this study. This survey aims to test the content validity of Consumer Perceived Brand Innovativeness (CPBI). CPBI is defined as “consumers’ perception of a brand’s track record of product innovations, degree of creativity, and potential for continued innovative activity in the future in a given market”.

You will find the list of potential 19 CPBI questions along with a space for each item to be filled out by the experts in the next page. Please comment on the questions according to their relevance and adequacy to CPBI. If the items are not relevant to “consumers’ perceptions of an innovative brand” or do not make sense, please print not relevant. If the questions are not adequately capture “consumers’ perceptions of an innovative brand”, please write your additional questions at the end of the questionnaire.

To facilitate the process of evaluation, please consider a brand name in a specific product category and read the item wordings based on your selected brand name [product category] such as Samsung mobile phones, or Toyota cars or any other example that you feel comfortable with. For example, to evaluate the item: “[Brand name] is a new product leader in the [product category] market”, you may read it as “Samsung is a new product leader in the smart phone market.”

(CONTINUE ON THE NEXT PAGE)

Consumers' perceptions of an innovative brand

Expert's Comments

	Item relevance
[Brand name] launches new [product category] and creates market trends all the time.	
[Brand name] is a new product leader in the [product category] market.	
[Brand name] sets itself apart from the rest when it comes to [product category].	
[Brand name] is an innovative brand when it comes to [product category].	
With regard to [product category], [brand name] is dynamic.	
[Brand name] is a cutting-edge [product category] brand.	
[Brand name] has changed the market with its [product category].	
[Brand name] makes new [product category] with superior design.	
[Brand name] [product category] makes me feel "Wow!"	
With regard to [product category], [brand name] constantly generates new ideas.	
[Brand name] has a track record of successful new [product category].	
[Brand name] is an advanced, forward-looking brand in the [product category] market.	
[Brand name] is a progressive brand when it comes to [product category].	
With regard to [product category], [brand name] is a creative brand.	
[Brand name] provides effective solutions to customer needs.	
Customers can rely on [brand name] to offer novel solutions to their needs.	
[Brand name] makes new [product category] that are easy to use.	
I expect [Brand name] to introduce innovative [product category] in the future.	
[Brand name] makes new [product category] with unusual colours.	

Please write your additional items in the space provided below.

	Additional Items
1	
2	
3	
4	
5	

Thank you for participating in this study!

Appendix B.3 Sample Questionnaire for Consumer Panel

Understanding Brands

QUESTIONNAIRE

Thank you for agreeing to participate in this survey. This survey aims to explore your perceptions of your mobile phone brand.

Your answers are very important to us. The project is being conducted as part of a University of Queensland research program. Completing the survey should take approximately 5 minutes. Please note that by completing this questionnaire, you demonstrate your consent to take part in this study. This questionnaire consists of one section.

We would like you to answer the questions as honestly as you can. Please note that:

- There is NO right or WRONG answer for the questions.
- We are only interested in your views.
- We are NOT trying to test your knowledge.

How to answer the questions? An example.

1. Please indicate your opinion about the following statement by placing a tick ✓ inside the appropriate box.

The design of this questionnaire is:								
Bad	1	2	3	4	5 ✓	6	7	Good
Unprofessional	1	2	3	4	5	6	7 ✓	Professional

2. To facilitate the process of evaluation, please read the item wordings based on your mobile phone brand name. For example if you have a Samsung mobile phone, to evaluate the item: “[Brand name] is a new product leader in the mobile phone market”, you may read it as “Samsung is a new product leader in the smart phone market.”

(CONTINUE ON THE NEXT PAGE)

Please indicate your opinion by placing a tick inside the appropriate box for each statement.

To what extent do you agree with the following statements about your mobile phone brand?

	Strongly disagree	Moderately disagree	Slightly disagree	Neither	Slightly agree	Moderately agree	Strongly agree
[Brand name] launches new mobile phones and creates market trends all the time.	1	2	3	4	5	6	7
[Brand name] is a new product leader in the mobile phone market.	1	2	3	4	5	6	7
[Brand name] sets itself apart from the rest when it comes to mobile phones.	1	2	3	4	5	6	7
[Brand name] is an innovative brand when it comes to mobile phones.	1	2	3	4	5	6	7
With regard to mobile phones, [brand name] is dynamic.	1	2	3	4	5	6	7
[Brand name] is a cutting-edge mobile phone brand.	1	2	3	4	5	6	7
[Brand name] has changed the market with its mobile phones.	1	2	3	4	5	6	7
[Brand name] makes new mobile phones with superior design.	1	2	3	4	5	6	7
[Brand name] mobile phones make me feel "Wow!"	1	2	3	4	5	6	7
With regard to mobile phones, [brand name] constantly generates new ideas.	1	2	3	4	5	6	7
[Brand name] has a track record of successful new mobile phones.	1	2	3	4	5	6	7
[Brand name] is an advanced, forward-looking brand in the mobile phone market.	1	2	3	4	5	6	7
[Brand name] is a progressive brand when it comes to mobile phones.	1	2	3	4	5	6	7
With regard to mobile phones, [brand name] is a creative brand.	1	2	3	4	5	6	7
[Brand name] provides effective solutions to customer needs.	1	2	3	4	5	6	7
Customers can rely on [brand name] to offer novel solutions to their needs.	1	2	3	4	5	6	7
[Brand name] makes new mobile phones that are easy to use.	1	2	3	4	5	6	7
I expect [Brand name] to introduce innovative mobile phones in the future.	1	2	3	4	5	6	7
[Brand name] makes new mobile phones with unusual colours.	1	2	3	4	5	6	7

Thank You!

Appendix B.4 Sample Questionnaire for Study B1

Understanding Brands QUESTIONNAIRE (Samsung example)

Thank you for participating in this survey. This survey aims to explore your perceptions of your selected mobile phone brand.

Your answers are very important to us. The project is being conducted as part of a University of Queensland research program. Completing the survey should take approximately 5 minutes. Please note that by completing this questionnaire, you demonstrate your consent to take part in this study. This questionnaire consists of two sections.

We would like you to answer the questions as honestly as you can. Please note that:

- There is NO right or WRONG answer for the questions.
- We are only interested in your views.
- We are NOT trying to test your knowledge.

How to answer the questions? An example.

Please indicate your opinion about the following statement by placing a tick ✓ inside the appropriate box.

The design of this questionnaire is:								
Bad	1	2	3	4	5 ✓	6	7	Good
Unprofessional	1	2	3	4	5	6	7 ✓	Professional

Section 1

Please answer the questions below about Samsung mobile phones. We are only interested in your perceptions. There is NO right or WRONG answer for the question.

1- Overall, my familiarity with Samsung mobile phones is:

Very unfamiliar	1	2	3	4	5	6	7	Very familiar
-----------------	---	---	---	---	---	---	---	---------------

(CONTINUE ON BACK)

Section 2

Please indicate your opinion by placing a tick inside the appropriate box for each statement.

To what extent do you agree with the following statements about your Samsung mobile phone?

	Strongly disagree	Moderately disagree	Slightly disagree	Neither	Slightly agree	Moderately agree	Strongly agree
Samsung launches new mobile phones and creates market trends all the time.	1	2	3	4	5	6	7
Samsung is a new product leader in the mobile phone market.	1	2	3	4	5	6	7
Samsung sets itself apart from the rest when it comes to mobile phones.	1	2	3	4	5	6	7
Samsung is an innovative brand when it comes to mobile phones.	1	2	3	4	5	6	7
With regard to mobile phones, Samsung is dynamic.	1	2	3	4	5	6	7
Samsung is a cutting-edge mobile phone brand.	1	2	3	4	5	6	7
Samsung has changed the market with its mobile phones.	1	2	3	4	5	6	7
Samsung makes new mobile phones with superior design.	1	2	3	4	5	6	7
Samsung mobile phones make me feel "Wow!"	1	2	3	4	5	6	7
With regard to mobile phones, Samsung constantly generates new ideas.	1	2	3	4	5	6	7
Samsung has a track record of successful new mobile phones.	1	2	3	4	5	6	7
Samsung is an advanced, forward-looking brand in the mobile phone market.	1	2	3	4	5	6	7
Samsung is a progressive brand when it comes to mobile phones.	1	2	3	4	5	6	7
With regard to mobile phones, Samsung is a creative brand.	1	2	3	4	5	6	7
Samsung provides effective solutions to customer needs.	1	2	3	4	5	6	7
Customers can rely on Samsung to offer novel solutions to their needs.	1	2	3	4	5	6	7
Samsung makes new mobile phones that are easy to use.	1	2	3	4	5	6	7
I expect Samsung to introduce innovative mobile phones in the future.	1	2	3	4	5	6	7

The following information is required for the purpose of the study only. It will remain confidential.

Are you male or female? Female Male

How old are you?

Thank You!

Appendix B.5 Sample Questionnaire and Measures for Study B2

Understanding Brands QUESTIONNAIRE (Samsung example)

Thank you for participating in this survey. This survey aims to explore your perceptions of your selected brand name.

Your answers are very important to us. The project is being conducted as part of a University of Queensland research program. Completing the survey should take approximately 10 minutes. Please note that by completing this questionnaire, you demonstrate your consent to take part in this study. This questionnaire consists of five sections.

We would like you to answer the questions as honestly as you can. Please note that:

- There is NO right or WRONG answer for the questions.
- We are only interested in your views.
- We are NOT trying to test your knowledge.

How to answer the questions? An example.

Please indicate your opinion about the following statement by placing a tick ✓ inside the appropriate box.

The design of this questionnaire is:								
Bad	1	2	3	4	5 ✓	6	7	Good
Unprofessional	1	2	3	4	5	6	7 ✓	Professional

Section 1

Please answer the question below about your selected brand name. We are only interested in your perceptions. There is NO right or WRONG answer for the question.

1- Overall, my familiarity with Samsung is:

Very unfamiliar	1	2	3	4	5	6	7	Very familiar
-----------------	---	---	---	---	---	---	---	---------------

(CONTINUE ON THE NEXT PAGE)

Section 2

This section includes several statements about **SAMSUNG Company**. Please think about the company brand name which has several product categories.

Please indicate your opinion about each statement by placing a tick inside the appropriate box for each statement. We are only interested in your views. There is NO right or WRONG answer.

To what extent do you agree with the following statements about Samsung Company?

<i>CPFI scale (Kunz et al., 2011)²²</i>	Strongly disagree	Moderately disagree	Slightly disagree	Neither	Slightly agree	Moderately agree	Strongly agree
Samsung is dynamic.	1	2	3	4	5	6	7
Samsung is very creative.	1	2	3	4	5	6	7
Samsung launches new products and creates market trends all the time.	1	2	3	4	5	6	7
Samsung is a pioneer company.	1	2	3	4	5	6	7
Samsung constantly generates new ideas.	1	2	3	4	5	6	7
Samsung has changed the market with its offers.	1	2	3	4	5	6	7
Samsung is an advanced, forward-looking firm.	1	2	3	4	5	6	7

(CONTINUE ON THE NEXT PAGE)

²² The scale names printed in this sample questionnaire were not printed in the actual questionnaire.

Section 3

This section includes several statements about **SAMSUNG in the mobile phone market**. Please think about the brand name in this specific product category.

Please indicate your opinion by placing a tick inside the appropriate box for each statement. We are only interested in your perceptions. There is **NO** right or **WRONG** answer for the question.

To what extent do you agree with the following statements about Samsung in the mobile phone market.?

<i>CPBI scale developed in this thesis</i>	Strongly disagree	Moderately disagree	Slightly disagree	Neither	Slightly agree	Moderately agree	Strongly agree
Samsung launches new mobile phones and creates market trends all the time.	1	2	3	4	5	6	7
Samsung is a new product leader in the mobile phone market.	1	2	3	4	5	6	7
Samsung sets itself apart from the rest when it comes to mobile phones.	1	2	3	4	5	6	7
Samsung is an innovative brand when it comes to mobile phones.	1	2	3	4	5	6	7
With regard to mobile phones, Samsung is dynamic.	1	2	3	4	5	6	7
Samsung is a cutting-edge mobile phone brand.	1	2	3	4	5	6	7
Samsung has changed the market with its mobile phones.	1	2	3	4	5	6	7
Samsung makes new mobile phones with superior design.	1	2	3	4	5	6	7
Samsung mobile phones make me feel "Wow!"	1	2	3	4	5	6	7
With regard to mobile phones, Samsung constantly generates new ideas.	1	2	3	4	5	6	7

(CONTINUE ON THE NEXT PAGE)

Section 4

This section includes several statements about the **mobile phones that SAMSUNG produces**. Please think about the product.

Please indicate your opinion about each statement by placing a tick inside the appropriate box for each statement. We are only interested in your views. There is NO right or WRONG answer.

To me, the Mobile Phones that SAMSUNG delivers, are:

(Please answer for each row) – CPPI scale (Andrews & Smith, 1996)

Dull	1	2	3	4	5	6	7	Exciting
Routine	1	2	3	4	5	6	7	Fresh
Conventional	1	2	3	4	5	6	7	Unconventional
Predictable	1	2	3	4	5	6	7	Novel
Usual	1	2	3	4	5	6	7	Unusual
Ordinary	1	2	3	4	5	6	7	Unique
Commonplace	1	2	3	4	5	6	7	Original
Worn Out	1	2	3	4	5	6	7	Trendsetting
Average	1	2	3	4	5	6	7	Revolutionary
Nothing Special	1	2	3	4	5	6	7	An Industry Model

Section 5

The following information is required for the purpose of the study only. It will remain confidential.

Are you male or female?

- Female Male

How old are you?

Thank You!

Appendix B.6 Sample Questionnaire and Measures for Study B3

Understanding Brands QUESTIONNAIRE (Samsung example)

Thank you for participating in this survey. This survey aims to explore your perceptions of your selected mobile phone brand.

Your answers are very important to us. The project is being conducted as part of a University of Queensland research program. Completing the survey should take approximately 10 minutes. Please note that by completing this questionnaire, you demonstrate your consent to take part in this study. This questionnaire consists of four sections.

We would like you to answer the questions as honestly as you can. Please note that:

- There is NO right or WRONG answer for the questions.
- We are only interested in your views.
- We are NOT trying to test your knowledge.

How to answer the questions? An example.

Please indicate your opinion about the following statement by placing a tick ✓ inside the appropriate box.

The design of this questionnaire is:								
Bad	1	2	3	4	5 ✓	6	7	Good
Unprofessional	1	2	3	4	5	6	7 ✓	Professional

(CONTINUE ON BACK)

Section 1

Please answer the questions below about Samsung in the mobile phone market. We are only interested in your perceptions. There is NO right or WRONG answer for the question.

1- Overall, my familiarity with Samsung mobile phones is:

Very unfamiliar	1	2	3	4	5	6	7	Very familiar
-----------------	---	---	---	---	---	---	---	---------------

2- Overall, my attitude towards SAMSUNG in the smart phone market is:

(Please answer for each row) – Brand attitude scale (Holbrook & Batra, 1987)²³

Unlikable	1	2	3	4	5	6	7	Likable
Negative	1	2	3	4	5	6	7	Positive
Unfavourable	1	2	3	4	5	6	7	Favourable
Bad	1	2	3	4	5	6	7	Good

²³ The scale names printed in this sample questionnaire were not printed in the actual questionnaire.

Section 2

This section includes several statements about **SAMSUNG in the mobile phone market**. Please think about the brand name in this specific product category.

Please indicate your opinion by placing a tick inside the appropriate box for each statement. We are only interested in your perceptions. There is NO right or WRONG answer for the question.

To what extent do you agree with the following statements about Samsung in the mobile phone market?

<i>CPBI scale developed in this thesis</i>	Strongly disagree	Moderately disagree	Slightly disagree	Neither	Slightly agree	Moderately agree	Strongly agree
Samsung launches new mobile phones and creates market trends all the time.	1	2	3	4	5	6	7
Samsung is a new product leader in the mobile phone market.	1	2	3	4	5	6	7
Samsung sets itself apart from the rest when it comes to mobile phones.	1	2	3	4	5	6	7
Samsung is an innovative brand when it comes to mobile phones.	1	2	3	4	5	6	7
With regard to mobile phones, Samsung is dynamic.	1	2	3	4	5	6	7
Samsung is a cutting-edge mobile phone brand.	1	2	3	4	5	6	7
Samsung has changed the market with its mobile phones.	1	2	3	4	5	6	7
Samsung makes new mobile phones with superior design.	1	2	3	4	5	6	7
Samsung mobile phones make me feel "Wow!"	1	2	3	4	5	6	7
With regard to mobile phones, Samsung constantly generates new ideas.	1	2	3	4	5	6	7

To what extent do you agree with the following statements about SAMSUNG in the mobile phone market?

<i>Eisingerich and Rubera (2010)'s scale of brand innovativeness</i>	Strongly disagree	Moderately disagree	Slightly disagree	Neither	Slightly agree	Moderately agree	Strongly agree
Samsung provides effective solutions to customer needs.	1	2	3	4	5	6	7
Customers can rely on Samsung to offer novel solutions to their needs.	1	2	3	4	5	6	7
Samsung always sells the same products regardless of current customer needs.	1	2	3	4	5	6	7
Samsung is not able to provide new solutions to customer needs.	1	2	3	4	5	6	7

Section 3

This section includes three questions with several statements about the **Samsung in the mobile phone market**. Please indicate your opinion about each statement by placing a tick inside the appropriate box for each statement. We are only interested in your views. There is NO right or WRONG answer.

When I think about SAMSUNG in the smart phone market, I feel:

<i>Excitement toward brand (Henard & Dacin, 2010)</i>	Strongly disagree	Moderately disagree	Slightly disagree	Neither	Slightly agree	Moderately agree	Strongly agree
Enthusiastic	1	2	3	4	5	6	7
Interested	1	2	3	4	5	6	7
Excited	1	2	3	4	5	6	7
Inspired	1	2	3	4	5	6	7
Motivated	1	2	3	4	5	6	7

To what extent do you agree with the following statements about SAMSUNG in the mobile phone market?

<i>consumer satisfaction (Stock, 2010)</i>	Strongly disagree	Moderately disagree	Slightly disagree	Neither	Slightly agree	Moderately agree	Strongly agree
I am very pleased with the mobile phones which Samsung delivers.	1	2	3	4	5	6	7
Samsung mobile phones fulfil my expectations.	1	2	3	4	5	6	7
Samsung is first choice for me for the purchase of mobile phones.	1	2	3	4	5	6	7
On an overall basis, Samsung mobile phones fulfil my expectations.	1	2	3	4	5	6	7

Section 4

The following information is required for the purpose of the study only. It will remain confidential.

Are you male or female?

- Female Male

How old are you?

Thank you for participating in this survey!

Appendix C: CPBI Processing Model - Sample Questionnaire for Laboratory Study

Understanding Brands
QUESTIONNAIRE (Nokia example)



Participant Consent and Information Form

Dear Participant

The title of this project is “Understanding Brands”. The project is being conducted as part of my PhD thesis at the University of Queensland Business School.

The survey aims to explore your perceptions of brands and new products. Completing the survey should take approximately 30 minutes. There are no right or wrong answers. I am only interested in what you think. The survey also asks general demographic questions.

There are no sensitive questions and no foreseeable risks to you from completing the survey. Once the data are collected, they will be stored electronically on a secure server. Please note that your answers are completely confidential and completely anonymous. Only aggregate results will be reported.

Your participation in the study is voluntary, and you may withdraw from the study at any time. If you complete only part of the survey, the data you provide will not be used.

This study adheres to the Guidelines of the ethical review process of The University of Queensland. Whilst you are free to discuss your participation in this study with project staff: Rahil Shams at r.shams@business.uq.edu.au; if you would like to speak to an officer of the University not involved in the study, you may contact the University’s Ethics Officer on +61 (7) 336 53924.

Kind Regards,
RAHIL SHAMS

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By clicking continue, you verify that you have read the above statement and consent to participate in this study. You should retain this information sheet for future reference.

Print

Thank you very much for agreeing to participate in this study!

This research aims to explore your perceptions of **different brands and products**.

There are **eight** sections in this questionnaire. Please answer all questions in each section. Your answers are very important to us. We would like you to answer the questions as honestly as you can. Please note that:

- There are no right or wrong answers for the questions
- We are only interested in your views
- We are not trying to test your knowledge

Most importantly:

Sometimes people answer survey questions not based on their true feelings but based on what they think the researcher wants to hear. The only thing I, as the researcher, would like to hear is your honest interpretation and feeling about the questions. So, please avoid giving answers you think I might want to here.

Please note that you will have a 4 hour time period in which to complete this 30 minutes survey. After 4 hours, partially completed surveys will be closed and data will be recorded as an incomplete survey. You cannot continue taking the survey once your data is recorded.

To start the survey, please continue on the next page.

Section 1

Please answer the following question about your perceptions of **Honda cars, Neutrogena skin care products and Nokia mobile phones**. Please note that we are not trying to test your knowledge, we are only interested in your honest views.

Please rate the extent to which you agree with or disagree with the following statement.

Brand familiarity (Simonin & Ruth, 1998) ²⁴	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
I am familiar with Honda cars.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can recognise Honda cars.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have heard about Honda cars before.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please rate the extent to which you agree with or disagree with the following statement.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
I am familiar with Neutrogena skin care products.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can recognise Neutrogena skin care products.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have heard about Neutrogena skin care products before.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please rate the extent to which you agree with or disagree with the following statement.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
I am familiar with Nokia mobile phones.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can recognise Nokia mobile phones.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have heard about Nokia mobile phones before.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

²⁴ The scale names printed in this sample questionnaire were not printed in the actual questionnaire.

Section 2

Please answer the following questions about your **sex** and **age**.

Are you female or male?

- Female
- Male

How old are you?

- 18 - 24
- 25 - 34
- 35 - 44
- 45 - 54
- 55 - 64
- 65 and more

Section 3

This section includes several questions about your perceptions of Nokia, specifically in the mobile phone market. Please note that:

- There are no right or wrong answers for the questions
- We are only interested in your views
- This is not a test of your brand knowledge



Please rate the extent to which you agree with or disagree with the following statements.

<i>Pre- CPBI scale developed in this thesis</i>	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Nokia sets itself apart from the rest when it comes to mobile phone devices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
With regard to mobile phone devices, Nokia is dynamic.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nokia is a cutting-edge mobile phone brand.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nokia mobile phone devices make me feel “Wow!”	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nokia launches new mobile phone devices and creates market trends all the time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nokia is an innovative brand when it comes to mobile phone devices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nokia makes new mobile phone devices with superior design.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
With regard to mobile phone devices, Nokia constantly generates new ideas.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nokia is a new product leader in the mobile phone market.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nokia has changed the market with its mobile phone devices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
With regard to mobile phone devices, select “disagree” on this line to continue.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Overall, my attitude towards Nokia in the mobile phone market is:
(Please answer for each row) -

<i>Brand attitude scale (Holbrook & Batra, 1987)</i>	1	2	3	4	5	6	7	
Unlikable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Likable
Negative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Positive
Unfavourable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Favourable
Bad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Good

Section 3 (Continued) – Filler Brand

This section includes several questions about your perceptions of Honda, specifically in the automobile market. Please note that:

- There are no right or wrong answers for the questions
- We are only interested in your views
- This is not a test of your brand knowledge



Please rate the extent to which you agree with or disagree with the following statements.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Honda sets itself apart from the rest when it comes to automobiles.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
With regard to automobiles, Honda is dynamic.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Honda is a cutting-edge automobile brand.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Honda automobiles make me feel "Wow!"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Honda launches new automobiles and creates market trends all the time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Honda is an innovative brand when it comes to automobiles.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Honda makes new automobiles with superior design.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
With regard to automobiles, Honda constantly generates new ideas.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Honda is a new product leader in the automobile market.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Honda has changed the market with its automobiles.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Overall, my attitude towards Honda in the car market is:
(Please answer for each row) -

	1	2	3	4	5	6	7	
Unlikable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Likable
Negative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Positive
Unfavourable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Favourable
Bad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Good

Section 4 – Filler task

This section starts with a short TV show clip about an automobile.

You are required to watch the first 5 minutes of this 7 minute clip. After 5 minutes you will be forwarded to the next page. Then, you will be asked a few questions about the content of the clip.

To complete this task:

- You must not leave the survey page
- You must not reopen the clip on YouTube website

Section 4 (Continued)

Please press the play button to watch the clip.



05 10

Section 4 (Continued)

Please answer the following questions about the TV show clip that you just watched.

The old ladies in the show were first going to?

- A bowling club
- Shopping
- A restaurant

What was the first new feature of the car that the old ladies were introduced to?

- A new wiper blade system
- New parking sensors
- New towing facilities

Before arriving at the picnic spot, the actors in the show...

- were clapping and enjoying music
- were talking to a police officer
- were having their sandwiches

This TV show was mainly about...

- Incrementally new automobiles
- Radically new automobiles
- Both incrementally and radically new automobiles

Section 5

In this section you will be asked to read and think about one technology and one new product that used this technology in either mobile phone or automobile categories. The category will be selected at random by the survey software.

The product description is in the next page. Please read the short description very carefully.

Please give us feedback as to your opinion about the new product and its technology by answering a few short questions in the following pages.

Please note that it is *very important* to read the description very carefully.

Section 5 (Continued) – Low TN

You will be automatically screened out of this study if you leave this page in less than a minute. Please read the description carefully.

Description 1 in the mobile phone market

Pixel oversampling technology was first revealed as an advanced picture management process for mobile phones at the Barcelona World Mobile Congress 8 years ago, in 2006. Although the technology dated from the 1990s when it was first used in digital cameras, it was not available in the mobile phone market until 2006.

This technology reduces an image taken at full resolution into a lower resolution picture by a process of combining many pixels into one perfect pixel, thus achieving higher definition and light sensitivity, and enables loss-less zoom.

Since 2006, the technology has been widely used and modified by mobile phone manufacturers throughout the world. For example the image below displays a mobile phone with an improved pixel oversampling camera that was introduced by a manufacturer 4 years ago, in 2010. Thanks to its improved pixel oversampling camera the user can catch all the action on film - as it happens. This mobile phone's camera is among good resolution sensors in the mobile phone market. Similar to most other mobile phones, the phone comes with 3G, memory of 16 or 32 GB and a 1.3 GHz CPU.



0100

Section 5 (Continued)

Please answer the following questions about your perceptions of **the product and its technology**. Please note we are interested in your initial impressions and expectations.

Please answer the questions based on what you feel about **the product and its technology**, even though you may have not experienced using the product.

For your convenience the above description is copied one more time here.

Description 1 in the mobile phone market

Pixel oversampling technology was first revealed as an advanced picture management process for mobile phones at the Barcelona World Mobile Congress 8 years ago, in 2006. Although the technology dated from the 1990s when it was first used in digital cameras, it was not available in the mobile phone market until 2006.

This technology reduces an image taken at full resolution into a lower resolution picture by a process of combining many pixels into one perfect pixel, thus achieving higher definition and light sensitivity, and enables loss-less zoom.

Since 2006, the technology has been widely used and modified by mobile phone manufacturers throughout the world. For example the image below displays a mobile phone with an improved pixel oversampling camera that was introduced by a manufacturer 4 years ago, in 2010. Thanks to its improved pixel oversampling camera the user can catch all the action on film - as it happens. This mobile phone's camera is among good resolution sensors in the mobile phone market. Similar to most other mobile phones, the phone comes with 3G, memory of 16 or 32 GB and a 1.3 GHz CPU.



Please rate the extent to which you agree with or disagree with the following statement.

<i>Technological newness scale (Garcia & Calantone, 2002 ;Olshavsky & Spreng, 1996)</i>	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
This product's technology is a minor variation of an existing technology.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The technological characteristics of his product are highly different from other mobile phones.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This product's technology is new.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please select the second scale point from the left to continue.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Please select the scale point as directed above.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Section 6

Interestingly, the manufacturer that introduced the above new mobile phone was **Nokia**. Please answer the questions based on what you feel about this Nokia product, even though you may have not experienced using this product.

Please rate the extent to which you agree with or disagree with the following statements.

<i>Product innovation-brand fit scale (Bouten et al., 2011)</i>	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
With regard to mobile phone devices, I think Nokia and this product complement each other.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
With regard to mobile phone devices, I think Nokia fits this product.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
With regard to mobile phone devices, I think this product adds to Nokia.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

To me, this product is:
(Please answer for each row)

<i>CPPI scale (Sethi et al., 2001)</i>	1	2	3	4	5	6	7	
Predictable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Novel
Usual	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Unusual
Ordinary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Unique
Commonplace	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Original
Dull	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Exciting
Not Trendsetting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Trendsetting

Please type in the word “blue” in lower case letters to continue.

Section 6 (Continued)

Overall, my attitude towards Nokia in the mobile phone market is:
(Please answer for each row) -

<i>Brand attitude scale (Holbrook & Batra, 1987)</i>	1	2	3	4	5	6	7	
Unlikable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Likable
Negative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Positive
Unfavourable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Favourable
Bad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Good

Please rate the extent to which you agree with or disagree with the following statements.

<i>Purchase intention scale (Dodds, Monroe & Grewal, 1991)</i>	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
If I were going to purchase a mobile phone, I would consider buying the above Nokia product.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I were shopping for a mobile phone, the likelihood I would purchase the above Nokia product is high.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My willingness to buy the above Nokia product would be high if I were shopping for a mobile phone.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The probability that I would consider buying the above Nokia product is high.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Section 6 (Continued)

Please rate the extent to which you agree with or disagree with the following statements.

<i>Post-CPBI scale developed in this thesis</i>	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Nokia sets itself apart from the rest when it comes to mobile phone devices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
With regard to mobile phone devices, Nokia is dynamic.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nokia is a cutting-edge mobile phone brand.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nokia mobile phone devices make me feel “Wow!”	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nokia launches new mobile phone devices and creates market trends all the time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nokia is an innovative brand when it comes to mobile phone devices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nokia makes new mobile phone devices with superior design.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
With regard to mobile phone devices, Nokia constantly generates new ideas.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nokia is a new product leader in the mobile phone market.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nokia has changed the market with its mobile phone devices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
With regard to mobile phone devices, select “disagree” on this line to continue.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Section 7

The following demographic information is required for the purpose of the study only. It will remain strictly confidential. I'm only interested in aggregate results. It will NOT be disclosed to any other party. Please answer ALL the following questions.

What year you were born?

What is the highest level of education you have completed?

- Less than High School
- High School
- Some College
- 2-year College Degree
- 4-year College Degree
- Master's Degree
- Doctoral Degree
- Professional Degree (JD,MD)

How many Nokia mobile phone devices have you purchased in the last 5 years?

- 0
- 1
- 2
- 3
- 4
- 5
- More than 5

What is the make and model of your current mobile phone?

(Please leave blank if you do not have one)

Finally, please feel free to write any other comments about this survey in the space provided below:

What do you think was the purpose of this study?

Thank You Page

***Please click the "next" button to submit your response.
We thank you for your time spent taking this survey.***

Please be informed that the products described in this survey were not real products.

Appendix D: CPBI Processing Model - Sample Questionnaire for Field Study

Understanding Brands QUESTIONNAIRE (Nokia example)



Participant Consent and Information Form

Dear Participant

The title of this project is “Understanding Brands”. The project is being conducted as part of my PhD thesis at the University of Queensland Business School.

The survey aims to explore your perceptions of brands and new products. Completing the survey should take approximately 20 minutes. There are no right or wrong answers. I am only interested in what you think. The survey also asks general demographic questions.

There are no sensitive questions and no foreseeable risks to you from completing the survey. Once the data are collected, they will be stored electronically on a secure server. Please note that your answers are completely confidential and completely anonymous. Only aggregate results will be reported.

Your participation in the study is voluntary, and you may withdraw from the study at any time. If you complete only part of the survey, the data you provide will not be used.

This study adheres to the Guidelines of the ethical review process of The University of Queensland. Whilst you are free to discuss your participation in this study with project staff: Rahil Shams at r.shams@business.uq.edu.au; if you would like to speak to an officer of the University not involved in the study, you may contact the University’s Ethics Officer on +61 (7) 336 53924.

Kind Regards,
RAHIL SHAMS

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UQ Business School
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Supervisors:
Associate Professor Frank Alpert, E-mail: f.alpert@business.uq.edu.au
Dr. Mark Brown, E-mail: m.brown@business.uq.edu.au

By clicking continue, you verify that you have read the above statement and consent to participate in this study. You should retain this information sheet for future reference.

Print

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Thank you very much for agreeing to participate in this study!

This research aims to explore your perceptions of **tablet devices**.

Currently there are many tablet devices in the market such as Samsung Galaxy, Windows Surface, Google Nexus, Apple iPad, Amazon Kindle Fire, Sony Xperia, Nokia Lumia and so forth. The focus of this survey is on a specific brand and new tablet that are named in the following pages.

There are five sections in this questionnaire. Please answer all questions in each section. Your answers are very important to us. We would like you to answer the questions as honestly as you can. Please note that:

- There are NO right or WRONG answers for the questions.
- We are only interested in your views.
- We are NOT trying to test your knowledge.

Most importantly:

Sometimes people answer survey questions not based on their true feelings but based on what they think the researcher wants to hear. The only thing I, as the researcher, would like to hear is your honest interpretation and feeling about the questions. So, please avoid giving answers you think I might want to hear.

Please note that you will have a 4 hour time period in which to complete this 20 minutes survey. After 4 hours, partially completed surveys will be closed and data will be recorded as an incomplete survey. You cannot continue taking the survey once your data is recorded.

To start the survey, please continue on the next page.

Section 1

Please answer the following question about your perceptions of **Nokia tablet devices**. Please note that we are not trying to test your knowledge, we are only interested in your honest views.

Please rate the extent to which you agree with or disagree with the following statement.

Brand familiarity (Simonin & Ruth, 1998) ²⁵	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
I am familiar with Nokia mobile phones.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can recognise Nokia mobile phones.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have heard about Nokia mobile phones before.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Section 2

Please answer the following questions about your **sex** and **age**.

Are you female or male?

- Female
- Male

How old are you?

- 18 - 24
- 25 - 34
- 35 - 44
- 45 - 54
- 55 - 64
- 65 and more

²⁵ The scale names printed in this sample questionnaire were not printed in the actual questionnaire.

Section 3

Please answer the following questions about your perceptions of **Nokia Lumia 2520**. Please note we are interested in your initial impressions and expectations about this new product.

Please answer the questions based on what you know or heard about Nokia Lumia 2520, even though you may have not experienced using the product. There is NO right or wrong answer for the questions.

NOKIA LUMIA 2520

One experience for everything in your life



Please rate the extent to which you agree with or disagree with the following statement.

<i>Technological newness scale</i> (Garcia & Calantone, 2002 ;Olshavsky & Spreng, 1996)	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Lumia 2520's technology is a minor variation of an existing technology.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The technological characteristics of Lumia 2520 are highly different from other tablets.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lumia 2520's technology is new.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Section 3(Continued)

Please select the second scale point from the left to continue.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Please select the scale point as directed above.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

To me, Nokia Lumia 2520 is:
(Please answer for each row)

<i>CPPI scale (Sethi et al., 2001)</i>	1	2	3	4	5	6	7	
Predictable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Novel
Usual	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Unusual
Ordinary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Unique
Commonplace	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Original
Dull	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Exciting
Not Trendsetting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Trendsetting
Useless	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Useful
Unnecessary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Necessary
Irrelevant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Relevant
Inappropriate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Appropriate

Please rate the extent to which you agree with or disagree with the following statements.

<i>Product innovation- brand fit scale (Bouten et al., 2011)</i>	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
I think Nokia and Lumia 2520 complement each other.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think Nokia fits Lumia 2520.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think Lumia 2520 adds to Nokia.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Section 4

This section includes several questions about your perceptions of Nokia, specifically in the tablet device market. Please note that:

- We are NOT trying to test your knowledge.
- We are only interested in your views.
- There are NO right or WRONG answers for the questions.



Section 4 (Continued)

Please rate the extent to which you agree with or disagree with the following statements.

<i>CPBI scale developed in this thesis</i>	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Nokia sets itself apart from the rest when it comes to tablet devices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
With regard to tablet devices, Nokia is dynamic.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nokia is a cutting-edge tablet brand.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nokia tablet devices make me feel "Wow!"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nokia launches new tablet devices and creates market trends all the time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nokia is an innovative brand when it comes to tablet devices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nokia makes new tablet devices with superior design.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
With regard to tablet devices, Nokia constantly generates new ideas.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nokia is a new product leader in the tablet market.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nokia has changed the market with its tablet devices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
With regard to tablet devices, select "disagree" on this line to continue.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Overall, my attitude towards Nokia in the tablet market is:
(Please answer for each row) -

<i>Brand attitude scale (Holbrook & Batra, 1987)</i>	1	2	3	4	5	6	7	
Unlikable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Likable
Negative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Positive
Unfavourable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Favourable
Bad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Good

Section 4 (Continued)

Please rate the extent to which you agree with or disagree with the following statements.

<i>Purchase intention scale (Rubera et al., 2011)</i>	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
If I were going to purchase a tablet device, Nokia Lumia 2520.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I were shopping for a tablet device, the likelihood I would purchase Nokia Lumia 2520 is high.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My willingness to buy the above Nokia Lumia 2520 would be high if I were shopping for a tablet device.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The probability that I would consider buying Nokia Lumia 2520 is high.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Section 5

The following demographic information is required for the purpose of the study only. It will remain strictly confidential. I'm only interested in aggregate results. It will NOT be disclosed to any other party. Please answer ALL the following questions.

What is the highest level of education you have completed?

- Less than High School
- High School
- Some College
- 2-year College Degree
- 4-year College Degree
- Master's Degree
- Doctoral Degree
- Professional Degree (JD,MD)

How many Nokia tablet devices have you purchased in the last 5 years?

- 0
- 1
- 2
- 3
- 4
- 5
- More than 5

What is the make and model of your current tablet device?

(Please leave blank if you do not have one)

Finally, please feel free to write any other comments about this survey in the space provided below:

Thank You Page:

We thank you for your time spent taking this survey.

Appendix E: Measures Used in the Thesis

Study B2: CPBI discriminant validity

Construct items / Study	Scale type (point)	Source
<p><i>Consumer Perceived Brand Innovativeness (CPBI)</i></p> <ol style="list-style-type: none"> 1. [Brand name] sets itself apart from the rest when it comes to [product category]. 2. With regard to [product category], [brand name] is dynamic. 3. [Brand name] is a cutting-edge [product category] brand. 4. [Brand name] [product category] makes me feel “Wow!” 5. [Brand name] launches new [product category] and creates market trends all the time. 6. [Brand name] is an innovative brand when it comes to [product category]. 7. [Brand name] makes new [product category] with superior design. 8. With regard to [product category], [brand name] constantly generates new ideas. 9. [Brand name] is a new product leader in the [product category] market. 10. [Brand name] has changed the market with its [product category]. 	Likert (7)	Developed and validated in this thesis
<p><i>Consumer Perceived Product Innovativeness (CPPI)</i></p> <ol style="list-style-type: none"> 1. Dull - Exciting 2. Routine - Fresh 3. Conventional - Unconventional 4. Predictable - Novel 5. Usual - Unusual 6. Ordinary - Unique 7. Commonplace - Original 8. Warmed Over - Trendsetting 9. Average - Revolutionary 10. Nothing Special - An Industry Model 	Semantic differential (7)	Andrews and Smith (1996)
<p><i>Consumer Perceived Firm Innovativeness (CPFI)</i></p> <ol style="list-style-type: none"> 1. [Brand name] is dynamic. 2. [Brand name] is very creative. 3. [Brand name] launches new products and creates market trends all the time. 4. [Brand name] is a pioneer company. 5. [Brand name] constantly generates new ideas. 6. [Brand name] has changed the market with its offers. 7. [Brand name] is an advanced, forward-looking firm. 	Likert (7)	Kunz et al., (2011)

Study B3: CPBI predictive and comparative validities

Construct items / Study	Scale type (point)	Source
<i>CPBI</i> : same as above		
<i>Brand attitude</i> 1. Unlikable - Likable 2. Negative - Positive 3. Unfavourable - Favourable 4. Bad – Good	Semantic differential (7)	Holbrook and Batra (1987)
<i>Consumer satisfaction</i> 1. I am very pleased with the [product category] which [Brand name] delivers. 2. [Brand name] [product category] fulfil my expectations. 3. [Brand name] is first choice for me for the purchase of [product category]. 4. On an overall basis, [Brand name] [product category] fulfil my expectations.	Likert (7)	Stock (2010)
<i>Excitement toward brand</i> 1. Enthusiastic 2. Interested 3. Excited 4. Inspired 5. Motivated	Likert (7)	Henard and Dacin (2010)
<i>Brand innovativeness</i> 1. [Brand name] provides effective solutions to customer needs. 2. Customers can rely on [Brand name] to offer novel solutions to their needs. 3. [Brand name] always sells the same products regardless of current customer needs. 4. [Brand name] is not able to provide new solutions to customer needs.	Likert (7)	Eisingerich and Rubera (2010)

Laboratory and Field Studies: Testing the CPBI model

Construct items / Study	Scale type (point)	Source
CPBI (pre/post) and Brand attitude: same as above		
<i>Brand familiarity</i> 1. I am familiar with [brand name] [product category]. 2. I can recognise [brand name] [product category]. 3. I have heard about [brand name] [product category] before.	Likert (7)	Simonin and Ruth (1998)
<i>Technological newness</i> 1. This product's technology is a minor variation of an existing technology. 2. The technological characteristics of his product are highly different from other [product category]. 3. This product's technology is new.	Likert (7)	Garcia and Calantone, (2002), Olshavsky and Spreng (1996)
<i>Product innovation – brand fit</i> 1. With regard to [product category] devices, I think [brand name] and this product complement each other. 2. With regard to [product category] devices, I think [brand name] fits this product. 3. With regard to [product category] devices, I think this product adds to [brand name].	Likert (7)	Bouten et al., (2011)
<i>Consumer perceived product innovativeness (CPPI)</i> 1. Dull - Exciting 2. Predictable - Novel 3. Usual - Unusual 4. Ordinary - Unique 5. Commonplace - Original 6. Not trendsetting – Trendsetting	Semantic differential (7)	Sethi et al., (2001)
<i>Purchase intention</i> 1. If I were going to purchase a [product category], I would consider buying the above [brand name] product. 2. If I were shopping for a [product category], the likelihood I would purchase the above [brand name] product is high. 3. My willingness to buy the above [brand name] product would be high if I were shopping for a [product category]. 4. The probability that I would consider buying the above [brand name] product is high.	Likert (7)	Dodds, Monroe and Grewal (1991)

Appendix F: Construct Glossary

Consumer perceived product innovativeness (CPPI): Consumers' perception of a brand's track record of product innovations, degree of creativity, and potential for continued innovative activity in the future in a given market (adapted from Henard & Dacin, 2010). Pre-CPBI refers to the consumer perceived product innovativeness prior to the introduction of the product innovation to the market. Post-CPBI refers to the consumer perceived product innovativeness after the introduction of the product innovation to the market. The terms consumer perceived brand innovativeness, CPBI, and brand innovativeness have been used interchangeably in the present thesis.

Consumer perceived product innovativeness (CPPI): From the consumer's perspective, product innovativeness has been defined along two broad dimensions: (1) the classical notion of newness (novelty) defined in terms of the relative difference between new and previous offerings (Garcia & Calantone, 2002) and (2) meaningfulness (value, usefulness, utility or advantage) which is the degree to which any new offering is also perceived as appropriate and useful by consumers (Rubera, Ordanini, & Griffith, 2011).

Perceived technological newness (TN): Technological newness is the extent to which the technology involved in a new product is different from prior technologies (Chandy & Tellis, 1998).

Brand attitude (BA): The brand attitude construct was operationalised as the overall predisposition towards the brand, following previous studies (e.g., Ruth & Simonin, 2006).

Purchase intention (PI): The purchase intention construct was operationalised as the overall intention expressed by the consumer to buy the brand [product category] in the future purchases, following previous studies (Dodds, Monroe & Grewal, 1991).

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