THE PREFERENCE FOR THE AESTHETIC MIDDLE: A PERCEIVED RISK BASED EXPLANATION AND THE MODERATING ROLE OF AESTHETIC EXPERTISE AND PRODUCT CONFIDENCE

by

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ABSTRACT

In the context of the aesthetics of consumer products, this study proposed an explanation for the preference for the aesthetic middle based on the psychological construct of perceived risks. The study proposed two research models and 17 hypotheses grounded in three theories of aesthetics: Theory of Thresholds (Berlyne, 1974), Processing Fluency Theory (Reber, Schwarz, & Winkielman, 2004), and Information-processing Model of Aesthetic Experience (Leder, Belke, Oeberst, & Augustin, 2004). The first research model expected that perceived risks will explain the preference for designs closer to the aesthetic middle. In the second research model, individual differences in aesthetic expertise and situational differences in consumer product confidence were expected to moderate the aesthetic middle effect. The proposed models and hypotheses were empirically tested among 120 female U.S. consumers (ages 21 to 41) through a quasi-experimental online study. Two consumer groups, recruited through a national survey company, with low and high levels of aesthetic expertise were exposed to products with three different levels of design aesthetics (low, medium and high), either with or without consumer product ratings in an online-store setting. The stimuli were followed by dependent measures of perceived risks and purchase intentions. The key proposal of this study, identifying perceived risks as a psychological explanation for consumers' preference for designs closer to the aesthetic middle, was confirmed. Aesthetic middle designs led to lowest risk perceptions and highest purchase intentions as compared to products with low or high design aesthetics. Further, this

study revealed that perceived risks (psycho-social, financial, and functional risks) mediate the effect of design aesthetics on purchase intentions. Additionally, this study revealed that individual differences in aesthetic expertise and situational differences in consumer product confidence moderate the effect of design aesthetics. For consumers with high aesthetic expertise or with high product confidence, high design aesthetics as compared to low design aesthetics led to lower risk perceptions and higher purchase intentions. Contrary to this, for consumers with low aesthetic expertise or with low product confidence, moderate design aesthetics led to lowest risk perceptions and highest purchase intentions. Numerous theoretical, methodological, and practical implications are discussed based on the findings of this study.

Dedicated to my parents

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TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF TABLES

LIST OF TABLES

LIST OF FIGURES

LIST OF FIGURES

CHAPTER I. INTRODUCTION

In the current era where products adequately satisfy the functional needs of consumers, product aesthetics has become a central criterion for consumers to assess and differentiate between products and brands (Bloch, 1995). The aesthetics of a product is often the first aspect that attracts consumers' attention, communicates product information, and facilitates product judgments (Bloch, 1995). Product aesthetics can trigger positive responses such as the immediate desire to own the product (Norman, 2004), willingness to pay higher prices (Bloch, Brunel, & Arnold, 2003), and increased desire to show off and care for the product (Bloch, 1995). Also, a good product design may alter the way consumers process other product attributes, such as product quality. Thus, product design is widely considered as a primary and highly effective factor for a company's success (Page & Herr, 2002). For example, according to the Design Management Institute: "2015 results show that over the last 10 years, design-led companies have maintained significant stock market advantage, outperforming the S&P [500 Index] by an extraordinary 211%" ("The Value", n.d.). Indeed, the designing and marketing of aesthetically pleasing products is a key determinant of market share (Bloch, 1995).

Despite the emphasis on design, not all designs are successful. The New York Times reported an "overwhelming number of design flops" due to various factors (Rawsthorn, 2007). Designers often use extreme design characteristics, such as extreme design minimalism and design novelty to gain consumer attention (Rawsthorn, 2007). This strategy creates products that are often overstyled (Rawsthorn, 2009), giving rise to the question "is more styling always better, or can too much styling actually hurt?" (Hagtvedt & Patrick, 2014, p. 518). Other disciplines of aesthetics such as the arts (Leder, Belke, Oeberst, & Augustin, 2004), music (Beauvois, 2007), architecture (Nohl, 2001), and poetry (Simonton, 1990) have highlighted the value of moderate aesthetic qualities over extreme ones. For example, Einstein argued that one should "make things as simple as possible, but not simpler" (Calaprice, 2010, p. 385) and Socrates suggested that *"*(one) must know how to choose the mean and avoid the extremes on either side, as far as possible" (Robertson & Walter, 2013, p. 69).

The principle of the aesthetic middle implies that stimuli with moderate aesthetic qualities stimulate more favorable responses than stimuli with extreme design characteristics (Fechner, 1876). In line with this principle, environmental psychologists also indicate that moderate visual stimuli are more likely to yield approach behavior (Berlyne, 1974; Cox & Cox, 2002; Giese, Malkewitz, Orth, & Henderson, 2014; Hung & Chen, 2012; Kumar & Garg, 2010; Mehrabian & Russell, 1974; Wang, Minor, & Wei, 2011; Wirtz, Mattila, & Tan, 2000). But why is this the case? The discipline of empirical aesthetics has provided arousal-based explanations for the aesthetic middle principle, arguing that moderate levels of stimulus - neither too low, nor too high – lead to an optimum degree of arousal, and eventually to maximal pleasure (Berlyne, 1974). Yet, given that many physiological states are associated with increased arousal, an

important aspect of consumer response to product design that remains to be explored is the underlying *psychological* explanation for the aesthetic middle preference besides the *physiological,* arousal-based explanation. Hence, the overarching goal of this research is to propose and test a psychological explanation for the aesthetic middle principle in the domain of product design.

Fight or flight. "You can take the person out of the Stone Age (...) but you can't take the Stone Age out of the person" (Nicholson, 1998, para. 1). Homo sapiens emerged over 200,000 years ago, yet evolutionary psychologists argue that the thoughts and emotions of Homo sapiens' psyches continue to drive many aspects of human behavior today. Individuals constantly assess their surroundings for increased threat levels to avoid any loss: "Is there a threat or opportunity? Should I avoid or approach?" In consumer decision-making, there is always an uncertainty of the outcome arising from several sources of risk (e.g., social, financial, and physical). Thus, the concept of perceived risk is fundamental to the understanding of consumers' choice behavior – the choice between products, brands, stores, or non-store alternatives. Anytime consumers consider purchasing a new product, subconsciously they face a set of uncertainties referred to as perceived risks. Consumers try to eliminate such uncertainties and to avoid any negative consequences to minimize the risks and, eventually, to successfully 'handle' the risk by employing different strategies. In other words, consumers employ a variety of risk-handling or risk-reducing activities (Bettman, 1973; Dowling & Staelin, 1994). One way to do so is using heuristics. Product design can serve as such a heuristic. Indeed, the Design Management Institute argues that design is a method of problem solving ("The Value of Design", n.d.). The aesthetic middle can thus help with problem solving by serving as a risk-reducer, leading to consumers

preferring the 'middle' to the extremities. This research proposes that perceived risks are a psychological explanation for the preference of the aesthetic middle over extreme alternatives. Another important question posed by this research is: *Does the aesthetic middle principle operate similarly for diverse types of consumers and decision contexts?* Certainly, consumer familiarity, experience, or involvement with a product (Alba & Hutchinson, 1987; Meyers-Levy & Malaviya, 1999; Zaichkowsky, 1985), constructs that are all closely related, can influence individuals' psychological processes (Petty, Cacioppo, & Schumann, 1983). Research has indicated that individual difference variables significantly influence consumers' aesthetic processing (Bloch et al., 2003; Silvia, 2013). Silvia (2013) argued that aesthetic expertise moderates a great number of aesthetic processes. For example, he revealed in several studies that consumers with different aesthetic expertise levels (experts vs. novices) differ in their arts experience and understanding (Silvia, 2013; Silvia & Berg, 2011). With respect to decision contexts, Giese et al. (2014) showed that the amount of product information can influence consumer response to product designs, such that when consumers have less product information available, they prefer moderate designs over other design combinations. These results suggest that the level of aesthetic expertise and consumer confidence in the product (from product information) are likely to influence the preference for the aesthetic middle.

Problem Statement

Research exploring product aesthetics have defined it based on high versus low product aesthetics (Page & Herr, 2002), physical appearance (Forsythe, 1995), overall design (good vs. bad), and emotional aesthetic dimensions (Klerk & Lubbe, 2006). For example, Page and Herr

(2002) explored product aesthetics, but operationalized it as design attractiveness. Classifying product aesthetics as attractive/ non-attractive or likeable/ non-likeable is subjective and may not provide objective implications for product design based on holistic principles of design. For instance, consumers may personally not like a design, but still find the design aesthetics to be high. Thus, it is important to operationalize product aesthetics objectively and holistically. We propose the construct, design aesthetics, which is a broader term encompassing product design as a whole as compared to specific design elements or principles such as complexity, typicality, and unity. We define design aesthetics as the 'form' of an object or environment (Hagtvedt & Patrick, 2014; Hoegg & Alba, 2008), that captures the design's perceived hedonic tone (Berlyne, 1974) and provides sensory pleasure and stimulation to the viewer (Bloch, 1995).

Previously, researchers have endeavored to investigate the influence of aesthetics on consumers' product evaluations (Hoegg & Alba, 2008). However, only a few studies mentioned risk in relation to aesthetics (Campbell & Goodstein, 2001; Thurgood, Hekkert, & Blijlevens, 2014; Wilson et al., 1993). For example, Wilson et al. (1993) demonstrated that evaluating aesthetics bears risk of making poor choices (Reber, Schwarz, & Winkielman, 2004). The only researchers who empirically examined the relationship between product design and risk are Campbell and Goodstein (2001) and Thurgood et al. (2014). Campbell and Goodstein (2001) explored risk in attempting to find an explanation for the preference for the norm in aesthetics. Their results indicated strong exploratory evidence of high social risk leading to a preference for the norm in aesthetics. These researchers defined "preference for the norm" as a product design that matches consumers' product category schema (Campbell & Goodstein, 2001). Thurgood et al. (2014) explored the typicality and novelty in product designs in relation to safety and risks.

They proposed that situations of safety and risk lead to preferences for a balance between novelty and typicality in product design. However, their manipulations were not successful and thus, their results did not confirm the relationship of design and risks (Thurgood et al., 2014). Further, in both studies, risk was defined as a one-dimensional, situational factor (high-risk versus context-free environment) instead of a multidimensional, perceived factor (Campbell & Goodstein, 2001; Thurgood et al., 2014). The current research will differ from Campbell and Goodstein's (2001) and Thurgood et al.'s (2014) work in that it will explore the relationship between risk and 'the aesthetic middle' rather than 'the norm' and it will operationalize risk as a perceived variable with three dimensions (i.e., psycho-social, functional, and financial risks). Further, the present research proposes that in addition to the decision environment, a product's design itself can lead to high- versus low- risk perceptions. Thus, this study explores risk as a perceived outcome variable in relationship to aesthetics, an aspect previously unexamined in the literature.

Researchers showed that level of expertise influences individual psychological processes (Petty et al., 1983). For example, Ross (1975) showed that the farther along the 'learning curve' that consumers are, the more confidence they have and the 'less inclined' they will be to seek information. Expertise has also been extensively studied in relations to aesthetic evaluations. For example, Silvia (Silvia & Berg, 2011; Silvia, 2013; Silvia & Barona, 2009) explored the relation between aesthetics and aesthetic expertise and found significant differences in the aesthetic preferences of aesthetic experts and novices. Even though the relationship between risk, involvement, expertise, and familiarity was explored to some extent, there is a clear gap in the literature regarding the role that such individual difference variables play in the relationship

between product aesthetics and risk perceptions. Understanding the link between these variables is particularly important because of their critical role in consumer decision-making.

Purpose Statement

The purpose of this research is to investigate whether perceived risk is a psychological factor that mediates the impact of design aesthetics on consumer response. Specifically, we will first explore if perceived risk provides the underlying psychological explanation for "the aesthetic middle preference" (Giese et al., 2014) (model 1). Moreover, we will explore if the aesthetic middle operates differently for low versus high aesthetic expertise consumers and when consumer confidence in the product is high versus low. In other words, this study will examine the moderating effects of individual differences in aesthetic expertise and situational differences in consumer confidence in the product on the aesthetic middle effect (model 2).

The specific objectives of Model 1 (The Effects of Design Aesthetics on Perceived Risks and Consumer Response) are to:

1. Test the aesthetic middle effect on consumers' responses by examining the direct effect of design aesthetics (low, moderate, high) on consumers' purchase intentions.
2. Examine the mediating role of the different dimensions of perceived risks [a) psycho-social, b) functional, and c) financial risk perceptions] in the relationship between design aesthetics and purchase intentions.

The specific objectives of Model 2 (The Moderating Role of Aesthetic Expertise and Product confidence) are to:

3. Explore the moderating role of consumer's level of aesthetic expertise (high vs. low) in the relationship between design aesthetics and perceived risks [a) psycho-social, b) functional, and c) financial risk perceptions] and purchase intentions.
4. Explore the moderating role of product confidence (high vs. low) in the relationship between design aesthetics and perceived risks [a) psycho-social, b) functional, and c) financial risk perceptions] and purchase intentions.

Significance of the Study

The preference for the aesthetic middle has been demonstrated in previous studies with respect to diverse products such as chairs (Hung & Chen, 2012), wine packages (Giese et al., 2014), direct mail postcard (Giese et al., 2014), sanders (Hekkert, Snelders, & van Wieringen, 2003), cars (Hekkert et al., 2003), telephones (Hekkert et al., 2003), and teakettles (Hekkert et al., 2003). Previously, the reason for this preference was argued to be arousal-based (Berlyne, 1974). While the arousal-based explanation is valuable in many instances, this study proposes and tests a perceived risk based psychological explanation, allowing further examination of the relationship and offering important implications for decision making. A broader understanding of the factors influencing consumers' perceived risks allows marketers to view the world through consumers' eyes (Mitchell, 1999). Furthermore, understanding consumers' risk perceptions in relation to a product's design can be helpful when implementing product design-based market

segmentation, targeting, and positioning, and determining appropriate levels and type of product information to alleviate perceived risks related to the product.

Another important aspect is to explore if there are differences in how consumers' aesthetic expertise and confidence in the product impact the aesthetic middle effect, and how these individual and situational differences influence risk perceptions. These are important 'second generation' research question for psychological aesthetics (Silvia, 2013). Understanding why experts and novices experience aesthetics differently can explain many interrelated problems, such as the "origins of aesthetic experience, the interaction of knowledge and perceptual experience in aesthetic judgment, and the nature of individual differences in emotional experience" (Silvia, 2013, p. 114). Findings from this study will reveal whether companies introducing new products to a general (undifferentiated market) may be more successful applying designs closer to the aesthetic middle, thus stimulating greater new product adoption among general consumers. Considering the level of design aesthetics to the success of new and existing brands/products is critical because high design aesthetic products may thrive when positioned for consumers with advanced aesthetic expertise, but may fail with consumers, who have limited expertise with aesthetic appreciation, due to their risk perceptions. Overall, this research will further extend the understanding of the fundamental dimensions of consumer responses (Mehrabian & Russell, 1974) by shedding light on the relationship between aesthetics, perceived risks, aesthetic expertise, and consumer confidence in the product, thus closing critical gaps in aesthetics literature.

Definition of Terms

Aesthetics: "The feelings, concepts, and judgments arising from our appreciation of the arts or of the wider class of objects considered moving, or beautiful, or sublime" (Blackburn, 2005, p. 8).

Aesthetic middle principle: A principle implying that products with moderate (as compared to low or high) design qualities yield most positive consumer response and approach behavior (Berlyne, 1974; Giese et al., 2014).

Aesthetic expertise: An individual difference variable that ranges from aesthetic non-expertise to aesthetic expertise, where "visual aesthetics dominate a consumer's acquisition and usage of goods" (Bloch, 2003, p. 552). Further, aesthetic expertise encompasses the knowledge gained through training, formal study, and experience in arts (Silvia & Barona, 2009). In this study, aesthetic expertise is operationalized through consumers' knowledge, education, interest, and occupation in art or design.

Design aesthetics: The form of objects, people, or consumption environments (Hagtvedt & Patrick, 2014; Hoegg & Alba, 2008; Patrick & Hagtvedt, 2011), referring to a design's perceived hedonic tone (Berlyne, 1974) and providing sensory pleasure and stimulation (Bloch, 1995). In this study, a product's design aesthetics is operationalized through ratings of its beauty, sensory pleasure, emotional level, and 'wow-factor'.

Centrality of visual product aesthetics (CVPA): The "overall level of significance that visual aesthetics hold for a particular consumer in his/her relationships with products" (Bloch et al., 2003, p.552).

Consumer confidence: The extent to which a consumer feels confident with respect to own marketplace decisions and behaviors (Bearden, Hardesty, & Rose, 2001; Paridon, 2006).

Product confidence: Consumers' confidence in the product's functionality and performance based on available product information. In this study, product confidence is operationalized through the availability or absence of other customers' product ratings.

Expertise: The highest levels of learning, training, knowledge, and strategies (Silvia & Barona, 2009).

Perceived financial risk: The perceived likelihood associated with not receiving the expected return on an investment or the uncertainties associated with the product costs (Dholakia, 2001). Financial risk is defined as consumers' perceived financial loss (Horton, 1976).

Perceived functional risk: A risk dimension that encompasses quality and performance concerns and refers to the probability that a product purchased results in inferior performance or failure to function as expected (Horton, 1976; Kim & Lennon, 2000; Peter & Tarpey, 1975).

Perceived psycho-social risk: A risk dimension that includes perceived psychological and social risks. Psychological risks refer to the probability that a purchase results in inconsistency with the self-image (Kim & Lennon, 2000). Social risk refers to the probability that a purchase results in disapproval by the social environment such as family or friends (Kim & Lennon, 2000).

Perceived risk: Consumers' subjective anticipation of loss (Sweeney, Soutar, & Johnson, 1999) and the subjective evaluation of uncertainties and negative consequences (Campbell & Goodstein, 2001)

Processing fluency: The ease with which consumers process an object and recognize it (Jacoby & Dallas, 1981; Reber et al., 2004)

Purchase intentions: A person's conscious plan to exert effort to purchase a product (Spears & Singh, 2004).

Wundt curve: A bell-shaped curve or inverted U-shaped curve introduced by Wilhelm Wundt (Fechner, 1876) reflecting the relationship between stimulus intensity and arousal. Arousal increases as the stimulus increases in intensity up to a point, until the increasing stimulation becomes less pleasant and ultimately aversive.

CHAPTER II. REVIEW OF LITERATURE

This chapter provides a review of literature related to the two models proposed in this research, and discusses the theories and frameworks based upon which the models are developed. This chapter also presents the hypotheses for each model separately.

Model 1: The Effects of Design Aesthetics on Perceived Risks and Consumer Response

Model 1 explores the direct effect of design aesthetics on purchase intentions and perceived risks. Further, it tests if perceived risks mediate the relationship between design aesthetics and purchase intentions. This section presents the review of literature and the theoretical framework on which model 1 is based; beginning with the introduction of the aesthetic middle principle, as the background for this study. The model is integrated with the review of existing research. Next, the hypotheses development section for model 1 presenting literature in support of each hypothesis follows. Finally, research model 1 visually summarizes the hypothesized relationships.

Theoretical Framework

The principle of the aesthetic middle. In 1876, Gustav Fechner was the first to describe "the principle of the aesthetic middle" in his early work "Vorschule der Ästhetik" (translated from German – "Preschool of Aesthetics"). This principle proposes that "people tolerate most often and for the longest time a certain degree of arousal, which makes them neither over stimulated nor dissatisfied by a lack of sufficient occupation" (Fechner, 1876, p. 217 as cited in Arnheim, 1985). Thus, 'the aesthetic middle principle' implies that stimuli with moderate aesthetic qualities stimulate more favorable responses than stimuli with extreme design characteristics. Wundt followed Fechner's (Fechner, 1876) seminal work by observing that the relationship between stimulus intensity and arousal forms a bell-shaped curve. Arousal increases as the stimulus increases in intensity up to a point, until the increasing stimulation becomes less pleasant and ultimately aversive. As a result, pleasure is maximal for moderate levels of stimulus - neither too low, nor too high. This principle is called the "aesthetic middle principle." Today, the bell-shaped curve is also called the Wundt Curve or Wundt-Fechner Curve.

Approximately 100 years after Wundt's finding, Berlyne (1974) revisited the idea of the 'aesthetic middle.' The core of Berlyne's research was the older Wundt Curve. He proposed the inverted-U model of arousal describing human preference for arousal that accompanies the thresholds of moderate levels of novelty and complexity. As long as the stimulation falls below a certain level, individuals will show no reaction. As arousal arises above this certain level, the object becomes increasingly rewarding, resulting in positive hedonic value. When the arousal potential is at a moderate level, the hedonic value will reach a peak. However, a further increase in arousal results in a drop in positive hedonic value until the object becomes unlikable and

punishing with a steady leveling off (Berlyne, 1974). Therefore, Berlyne's theory of aesthetics is called the 'theory of thresholds' with the highest positive hedonic value for the 'aesthetic middle'. The aesthetic middle principle proposes that the most effective designs are not the most attractive ones; more likely designs with a moderate attractiveness yield most positive consumer and approach behavior (Giese et al., 2014). Moderate designs are visual representations closer to the aesthetic middle.

Furthermore, Berlyne (1974) suggested that when presented with complex stimuli, respondents feel an increase in arousal, but also in uncertainty. Uncertainty can be related to risk, thus, Berlyne indicated that complexity, arousal, and risk are related. Indeed, in aesthetics theory, the variable of perceived risk is often disregarded. Though, not detailed in Berlyne's (1974) research, subsequent research suggests a significant relationship between aesthetics and perceived risks. Berlyne (1971) introduced independent cognitive variables such as novelty, complexity, uncertainty, conflict, and unfamiliarity (Shimamura & Palmer, 2012). These independent variables represent what happens when incoming information does not match people's knowledge or expectations, thus can in some way be seen as "one variable". Berlyne (1971) preferred to call this "one variable" "uncertainty" or "conceptual conflict" (Shimamura & Palmer, 2012). Thus, Berlyne discussed variables of uncertainty, but did not further describe the variable of perceived risks.

Leder et al. (2004) integrated Fechner's and Wundt's early findings in their information-processing model of aesthetic experience, grounded in a constant cognition-affect interaction process (Leder et al., 2004). The model provides insight into the understanding of processes within the cognitive system of the perceiver that occur when evaluating arts (Leder et al., 2004)

or design in general. According to Leder et al. (2004), aesthetic experiences contain five processing stages: "perception, implicit classification, explicit classification, cognitive mastering, and evaluation" (p. 489). For example, cognitive mastering is needed for information processing when evaluating a product design. There are two types of outputs of the model - aesthetic emotion (i.e. affect) and aesthetic judgment (i.e. cognitive aspect of aesthetic processing). While processing the above-mentioned stages, aesthetic emotions result from continuous and pleasing affective judgment, whereas aesthetic judgment results from uncertainty about the object. Uncertainty is closely related to perceived risks (Ross, 1975). Though, not detailed in Leder et al.'s (2004) research, their model suggests a relationship between aesthetic stimuli and perceived risks, and thus allows us to propose that perceived risks may explain the preference for the aesthetic middle.

Background Literature

Design aesthetics. Previous research has emphasized the significant role that product aesthetics plays in consumer response (Cox & Cox, 2002; Creusen et al., 2010), because it is often the first aspect of the product that catches consumers' attention and allows making product judgments from a distance. In 1735, Baumgarten introduced the term 'aesthetics' grounded in the Greek word aisthēsis (i.e., perception from the senses, such as feeling, hearing, and seeing), and described aesthetics as perfect representations for the sense experience. Aesthetics relates to "the feelings, concepts, and judgments arising from our appreciation of the arts or of the wider class of objects considered moving, or beautiful, or sublime" (Blackburn, 2005, p. 8). In the field of consumer psychology, studies used 'aesthetics' mostly in describing the form of objects, people, or consumption environments (Hagtvedt & Patrick, 2014; Hoegg & Alba, 2008; Patrick &

Hadtvedt, 2011). Design attractiveness, an aspect of design aesthetics, refers to a design's perceived hedonic tone (Berlyne, 1974), providing sensory pleasure and stimulation (Bloch, 1995), and encompassing the product's beauty.

Beauty has long been associated with positive facets, such that attributes with positive qualities are matched to attractive individuals and less positive qualities to less attractive ones (Dion, Berscheid, & Walster, 1972; Hagtvedt & Patrick, 2014). In fact, beautiful individuals are expected to be more successful based only on their appearances (Dion et al., 1972). However, 'what is beautiful is good' does not only apply to humans, it also applies to products and services. In previous research, the positive relationship between a good design and consumers' responses has been well supported (Bloch et al., 2003). Indeed, a good design strongly influences consumers' responses and can generate positive affect and liking (Landwehr, Wentzel, & Herrmann, 2010). Furthermore, a good design can boost consumers' purchase intentions by increasing the product's or service's perceived value (Creusen & Schoormans, 2005). If two products with a similar utilitarian value are offered, the more attractive alternative is most likely to be chosen (Kotler & Rath, 1984). Overall, theory and empirical evidence have indicated that product design has an important role in the persuasive ability of products and strongly influences consumer response.

Perceived risks. "The concept of risk is one of the most pervasive in the theories of human choice" (Dowling, 1986, p. 1). Risk can be described as a subjective anticipation of loss (Sweeney et al., 1999) and the subjective evaluation of uncertainty and negative consequences (Campbell & Goodstein, 2001). Cunningham (1967, p. 37) conceptualized perceived risk in terms of two similar components, namely: "the amount that would be lost if the consequences of

an act were not favorable, and the individual's subjective feeling of certainty that the consequences will be unfavorable." We will adopt this definition. Bauer was the first to introduce the concept of perceived risk in relation with consumer behavior in 1960. He emphasized that he was concerned only with subjective risk. Indeed, literature differentiates objective and subjective risk. Objective risk is also called "real world" risk whereas subjective risk the subjective perception of risk. The average consumer has limited information and memory making it difficult to speak about objective risk, which only can be assessed objectively by actuaries or accountants, who may have the resources (including historical data) to estimate the risk objectively. In decision-making, often consumers are faced with a new purchase task making the objective, accurate assessment of risk nearly impossible. Even if the consumer would be able to judge correctly the risk involved, it is not the objective risk that motivates his or her behavior, but rather subjective impressions of it. Thus, measurement of risk perception must be developed with this limitation in mind. This study will focus only on subjectively perceived risk.

Risk aversion is a behavior universal to humans and animals (Hintze, Olson, Adami, & Hertwig, 2015). Individuals constantly evaluate situations as either favorable or unfavorable to their prospects of survival. In other words, there is an ongoing assessment of threat level (Kahneman, 2011). Bauer (1960) proposed that any consumer behavior could serve as an example of risk-taking. Thus, perceived risk is fundamental to the understanding of consumer behavior (Mitchell & McGoldrick, 1996), since it plays a central role in consumers' evaluations, choices, and behaviors (Campbell & Goodstein, 2001; Dowling & Staelin, 1994). Indeed, perceived risk is very useful for explaining consumers' behavior since consumers are often more strongly motivated to prevent mistakes than to maximize the benefits of purchase (Mitchell,

1999). Therefore, perceived risk is a very important variable in the social sciences. In any task that involves action, people typically assess the odds of losses or negative consequences, and thus, consider the risks perceived. In consumers' decision-making, perceptions of risk arise due to the desire to make the 'right' choice for the outcome. There is always an uncertainty of the outcome arising from several sources of risk. Thus, usually, one or more sources may drive consumers' overall perceptions of risk (Campbell & Goodstein, 2001). For this reason, previous researchers emphasized the multidimensional quality of perceived risk with six main dimensions: financial, performance, social, physical, psychological, and time risk (Jacoby & Kaplan, 1972). Both, psychological and social risks relate to consumers' psychological discomfort and well-being. Thus, in the present research these types of risks are combined and labeled psycho-social risk. In consumer's purchasing process, it is unlikely that a real physical risk in terms of bodily harm will exist; rather consumers may worry about certain product features, such as the material and finishing of the product, which may be harmful to the own skin. This product concern is closely related to performance risk. Thus, perceived physical risk and performance risk are also combined in this research and labeled functional risk.

Psycho-social risk. Psychological risks refer to the probability that a purchase results in inconsistency with the self-image (Kim & Lennon, 2000) leading to frustration, disappointment, and shame that can be experienced before, during, or after the purchasing task. Social risk is related to the consumers' concerns that a product purchased results in the disapproval of the social environment, such as family or friends (Kim & Lennon, 2000). In the context of consumer products, an important risk dimension is psycho-social risk. Psycho-social risk is related to consumers' concerns that using a product reduces one's psychological well-being or social status

leading to anxiety and psychological discomfort (Dholakia, 2001). In a purchasing task, consumers may face questions about whether a given purchase is the morally right choice. For example, if a consumer considers purchasing an expensive, conspicuous piece of luxury furniture and knows that his/her family values a modest lifestyle, the consumer may have concerns about creating a materialistic self-image resulting in psychological discomfort. Previous research has indicated the importance of psycho-social risk for hedonic products (Jacoby & Kaplan, 1972), because hedonic products are often displayed and visible to others communicating the owner's self-image (Liljander, Polsa, & van Riel, 2009). Thus, shopping for hedonic products can closely relate to consumers' psycho-social risk.

Functional risk. Another important dimension in the context of product design is functional risk, which encompasses quality and performance concerns. It is associated with inferior performance of a product. Functional risk is one of the most common types of perceived risk (Grewal, Krishnan, Baker, & Borin, 1998; Liljander et al., 2009), referring to the fear that a product will fail to deliver promised functions or benefits. A new outdoor jacket, for example, might fail to protect the wearer from rain, or a chemically colored scarf may irritate the wearer's skin.

Financial risk. Financial risk is related to concerns of not receiving the expected return on an investment or insecurities associated with the cost of the product (Dholakia, 2001). Financial risk is described as consumers' perceived monetary loss (Horton, 1976), which can be experienced at the point of purchase, but also later due to possible repairs, refund, or replacement (Sweeney et al., 1999). When buying a high-design product, consumers may have concerns regarding its usability and fit, and thus may fear of not receiving the expected financial outcome.

These different types of risks can increase consumers' uncertainty. Uncertainty of the outcome includes possible negative consequences, such as losses that may occur as well as the extent of those losses (Mitchell, 1995). For this reason, reducing uncertainties and, therefore, reducing perceived risks, is more likely than reducing inconvenient consequences (Ross, 1975). In order to reduce risk to a tolerable level, people go through complex decision-making processes (Engel, Kollat, & Blackwell, 1973), often leading to a variety of risk-handling activities (Bettman, 1973; Dowling & Staelin, 1994). The preference for the aesthetic middle could be seen as one such a risk-handling activity. In other words, the aesthetic middle may serve as a risk reducer, with consumers preferring the "middle" to the extreme.

Hypothesis Development

The preference for the aesthetic middle - A plausible psychological explanation. An aesthetically pleasing design can positively influence consumer responses to products (Bloch, 1995) and tends to be evaluated more positively than one in which styling is lacking (Bloch, 1995; Hagtvedt & Patrick, 2009). An aesthetically unappealing design may evoke distaste (Bloch, 1995), and is thus usually undesirable for products. However, previous research proposed that the 'beauty is good' concept does not always apply (Hagtvedt & Patrick, 2014). In fact, an extreme design or an overemphasis on design elements may be harmful to the product's saleability too. Sometimes, consumers face a negative attractiveness-bias, such as "if it's pretty, it won't work" (Hagtvedt & Patrick, 2014, p. 519). Dermer and Thiel (1975) argued that beautiful people elicit "undesirable attributions regarding vanity, egotism, likelihood of marital disaster (…) and likelihood of being bourgeois" (p. 1168). This negative attractiveness-bias might extend to products as well, such that an offer may be perceived too good to be true,

eventually resulting in negative judgment and avoidance behavior. Indeed, recently Russo and De Moraes (2003) found that aesthetically pleasing products are often suspected to hide "harm behind its beauty" (p.146). Thus, high design aesthetics may lead to protective actions, such as avoiding and not purchasing the product.

Hence, researchers have argued that for product designs to be successful, it is crucial to have moderate design attributes rather than extreme ones. For example, Berlyne (1974) suggested that individuals dislike stimuli that are perceived too low or too high on specific qualities. Deering and Jacoby (1972) have argued that products, "which are neither extremely high nor low in perceived risk" (p. 406) result in maximal preference. Recently, Giese et al. (2014) supported previous findings by showing that designs that look 'normal' and that are closer to the aesthetic middle are most effective in leading to purchase intentions. Furthermore, Cox and Cox (2002) confirmed this relationship: moderate levels of design complexity were most well-liked by consumers. This study tests the aesthetic middle effect and hypothesizes the following:

H1: Design aesthetics will have a direct effect on purchase intentions, such that purchase intentions will be higher for moderate design aesthetics as compared to a) low or b) high design aesthetics.

The negative-attractiveness bias from extreme designs can also result in negative psychological responses (Hagtvedt & Patrick, 2014). For example, Berlyne (1974) suggested that a complex stimulus can create an uncomfortably high level of uncertainty (Cox & Cox, 2002),

which is a main component of perceived risks (Grønhaug, 1972). According to Berlyne's (1974) findings, it can be expected that extreme or high design aesthetics can eventually lead to high-risk perceptions. Hagtvedt and Patrick (2014) further argued that 'overstyling' can result in a decrease in perceived functionality. For example, an extremely well-designed coffee maker may raise questions regarding functionality, leading to high product performance risks. Based on previous researches findings, it can be expected that a product's design aesthetics affects consumers' perceived risks.

Even though previous findings supported the aesthetic middle principle, none of the previous studies provided and tested an explanation for the preference of the aesthetic middle (e.g., Berlyne, 1974; Giese et al., 2001). The only researchers who made an effort towards understanding the preference for the aesthetic middle and thus, studied the relationship between product design and risk are Campbell and Goodstein (2001) and Thurgood et al. (2014). Campbell and Goodstein's (2001) study indicated a significant relationship between social risk as a situational variable and product design, revealing that high social risk situations lead to a preference for the 'norm'. Furthermore, they argued that perceived situational social risk is the underlying reason for the preference for the norm in aesthetics (Campbell & Goodstein, 2001). Thurgood et al. (2014) did propose a relationship between risk and product design, however, their manipulation was not successful.

This study proposes and tests if perceived risks are an unexplored psychological explanation for the aesthetic middle preference. In other word, the present study proposes that the psychological explanation for consumers preferring the "middle" to the extreme is that the aesthetic middle can serve as a risk-reducer. Therefore, it is expected that products with

moderate design aesthetics will lead to lower risk perceptions as compared to products with high and low design aesthetics:

H2: Design aesthetics will have a direct effect on consumers' risk perceptions, such that there will be lower a) psycho-social risk perceptions, b) functional risk perceptions, and c) financial risk perceptions associated with a product having moderate than high design aesthetics.

H3: Design aesthetics will have a direct effect on consumers' risk perceptions, such that there will be lower a) psycho-social risk perceptions, b) functional risk perceptions, and c) financial risk perceptions associated with a product having moderate than low design aesthetics.

Perceived risks and purchase intentions. Given that purchase intentions are a person's conscious plan to exert effort to purchase a product (Spears & Singh, 2004), in other words it is predictive of a person's actual behavior (e.g., purchase, usage), it is one of the most important variables for marketers (Berkowitz, 1987). Hence, purchase intentions will be measured in the current study as an outcome variable. The effect of perceived risks on purchase intentions has been verified by a considerable number of previous studies (e.g., Darden & Dorsch, 1990; Eastlick & Feinberg, 1995; Han, 2006; Kim & Lennon, 2000; Kwon, Paek, & Arzeni, 1991). For example, Kim and Lennon (2000) revealed when consumers perceived less risk, their intent to purchase products increased and vice versa. Their finding that perceived risks negatively

influence intent to purchase has been consistently confirmed by other studies (e.g., Kim & Lennon, 2000; Wee et al., 1995). Thus, we hypothesize the following hypothesis:

H4: Perceived risks [a) psycho-social, b) functional, and c) financial risk perceptions] will have a negative influence on consumers' purchase intentions.

Grønhaug (1972), who was one of the firsts to study perceived risks, described perceived risks as a "condition the individual consumer experiences" (p. 247) from the time the uncertainties arise by processing stimuli until a purchase or non-purchase decision is made. In other words, perceived risks can be seen as a condition arising from stimulus processing, ultimately impacting consumers' purchase intentions. Grønhaug (1972) description of perceived risks thus allows inferring that perceived risks will mediate the relationship between a stimulus and consumers' behavioral response. Also, other study findings allow inferring that perceived risks are likely to mediate the relationship between design aesthetics and purchase intentions by showing that aesthetics have a significant effect on consumers' behavioral response and on psychological response to a stimulus (e.g., Bloch, 1995). Indeed, Bloch's (1995) model shows that psychological responses to design lead in turn to behavioral responses, such as approach or avoidance. Given that psychological responses are usually a predictor of consumer behavior, it can be expected that perceived risks will mediate the effect of design aesthetics on purchase intentions. Thus, this research proposes and tests the following:

H5: *Perceived risks [a) psycho-social, b) functional, and c) financial risk perceptions] will mediate the relationship between design aesthetics and purchase intentions.*

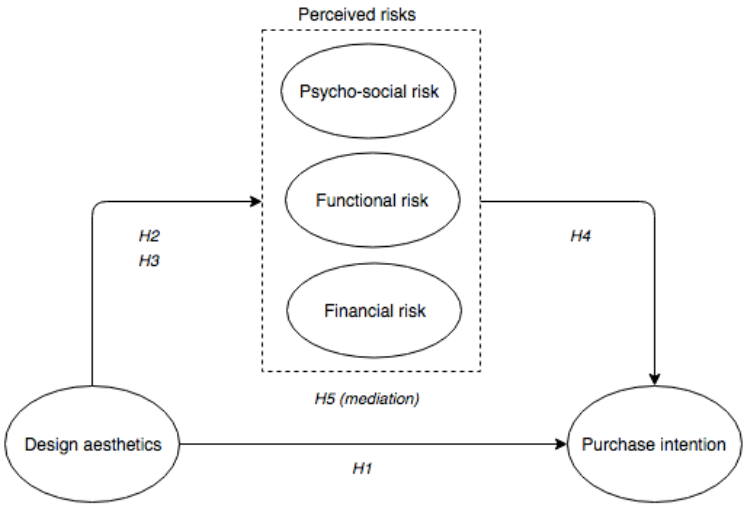


Figure 1. The conceptual framework of model 1.

Model 2: The Moderating Role of Aesthetic Expertise and Product Confidence

Model 2 explores the moderating role of aesthetic expertise and product confidence in the relationship between design aesthetics and consumers' psychological response (perceived risks), and their behavioral response (purchase intentions). This section presents the review of literature and the theoretical framework on which model 2 is based. The section begins with the introduction of Reber et al.'s (2004) processing fluency theory, as the underlying conceptual framework for this model. Next, the hypotheses development section for model 2 presents

literature in support of each hypothesis. Finally, research model 2 visually summarizes the hypothesized relationships.

Theoretical Framework

Processing fluency theory. Reber et al.'s processing fluency theory (2004) has attracted the attention of scholars in the area of aesthetics (Reber et al., 2004) and advertising research (Lee & Labroo, 2004). The theory's core concept is that the perceiver's response to an object depends on the perceiver's fluency of processing. According to Reber et al. (2004), a perceiver's response to an object is built in the perceiver's fluency of the processing experience. Interactions between the object attributes and the perceiver's cognitive and affective processes influence the processing experience. In other words, "aesthetic pleasure is a function of the perceiver's processing dynamics" (Reber et al., 2004, p. 365), indicating that the more easily the perceiver is able to understand an object and its attributes, the more positive the response and attitude towards the object and vice-versa.

The concept of processing fluency includes perceptual fluency and conceptual fluency. Perceptual fluency relates to a stimulus's perceptual features and is influenced by its physical attributes (Reber et al., 2004). Conceptual fluency is related to the ease with which a person mentally processes the meaning of a stimulus (Reber et al., 2004; Whittlesea, 1993) and is associated with the meaning or knowledge structure a person has about a stimulus. Following Reber et al.'s (2004) approach, we will use the more general term *processing fluency* to reflect these commonalities.

The processing fluency theory (Reber et al., 2004) proposed three basic assumptions. First, objects are processed with differing fluency. The researchers identified several variables

known to influence the processing fluency of stimuli: symmetry, figural goodness, figure-ground contrast, prototypicality, and stimulus repetition (Reber et al., 2004). Thus, stimuli with less perceptual information (e.g., higher figural goodness) are easier to process. For example, prototypicality has been found to influence speed of processing and the response time (Mervis, Catlin, & Rosch, 1976). Second, processing fluency itself has a hedonic aspect and is subjectively perceived and experienced as positive (Reber et al., 2004). Third, processing fluency impacts a person's judgment because people rely on their subjective experience when evaluating a stimulus (Reber et al., 2004). According to the processing fluency theory (Reber et al., 2004), a person's attitude toward a product is influenced by the ease with which the product can be identified and recognized. The more fluently an object can be processed, the more positive the aesthetic pleasure will be. The ease of processing a stimulus will lead to faster processing time, positively influencing the attitude toward the stimulus and behavioral intention with respect to the stimulus. Thus, Reber et al. (2004) proposed that "beauty is grounded in the processing experience of the perceiver" (p. 364).

Reber et al. (2004) also explored several variables that influence the perceiver's processing fluency. For example, objective features of stimuli such as the amount of information are examined. Other variables discussed in Reber et al.'s (2004) processing fluency research belong to the history of a perceiver's experience with the stimulus. Specifically, they discussed the differences between experts versus novices. In general, experts prefer more complexity and non-experts prefer more simplicity and Reber et al. (2004) explained this phenomenon using the processing fluency theory. Specifically, expertise allows consumers to identify and recognize a stimulus more fluently due to available knowledge structures. Also, other researchers provide an

explanation for the distinctive preferences by experts versus non-experts. For example, according to the mere exposure effect (Zajonc, 1968), recurring exposure to an object results in more positive evaluations and responses (Reber et al., 2004). Several researchers showed that processing fluency is central to the mere exposure effect. For example, Lee and Labroo (2004) found that consumers evaluate a product more favorably if they have prior exposure to the product. Their findings can be explained by the fluency theory (Reber et al., 2004), such that as prior exposure enables ease of processing and in turn leads to increased liking. Expertise in arts is grounded in intensive exposure to arts leading to an ease in processing. In the current research, the processing fluency theory (Reber et al., 2004) will serve as a theoretical background for model 2 allowing this study to infer the impact of the level of aesthetic expertise (high vs. low) on the relationship between design aesthetics and consumers' psychological responses and behaviors.

Background Literature and Hypothesis Development

Expertise. Expertise indicates the highest levels of learning, training, knowledge, and strategies (Silvia & Barona, 2009). An expert is "one who has acquired special skill in or knowledge of a particular subject through professional training and practical experience" (Webster's Third New International Dictionary, 1976, p. 800). In consumer research, the topics of learning and expertise have been closely related and generally involve comparisons of the market behavior of more knowledgeable and less knowledgeable consumers. Product knowledge refers to "the amount of accurate information held in memory as well as self-perceptions of product knowledge" (Fu & Elliott, 2013; Rao & Sieben, 1992, p. 258). Compared to non-experts, the more knowledgeable consumers are the experts in the sense of representing the highest

attainable levels of knowledge (e.g., grand masters in chess, medical doctors, etc.). Experts have an extensive domain of knowledge because of their training that can be applied when examining a product (Silvia & Barona, 2009).

Product involvement is a concept very closely related to expertise. Comparable to expertise, product involvement is a multifaceted, motivational concept, which covers the importance, value, needs, and interest in relation to a product for the individual. Previously, two types of involvement have been identified: enduring versus situational involvement (Dholakia, 2001). Enduring involvement describes the ongoing concern for a product independent of a specific situation, whereas situational involvement refers to the raised interest level of a specific situation (Dholakia, 2001). Enduring involvement includes consumers' motivation, but also ability to evaluate the product. Product involvement leads to a more detailed product class knowledge (Hekkert et al., 2003). Thus, enduring involvement is positively related to the construct of familiarity and level of expertise, such that if the consumer is highly involved, knowledge and expertise increases respectively (O'Cass, 2004). Individuals that are more involved in arts are likely to be more familiar, more knowledgeable, and are likely to have a higher expertise level than individuals that are less involved. Product involvement indeed leads to a more detailed product class knowledge (Hekkert et al., 2003). Since the constructs of involvement, knowledge, and expertise are very closely related, we will use the term *expertise* to capture the commonalities of involvement, knowledge, learning, and training in a specific field.

One specific type of expertise that has been discussed in aesthetics research is expertise in arts, also called aesthetic expertise (Silvia, 2013; Silvia & Barona, 2009). Aesthetic expertise can be gained through formal study, knowledge gained through training, and experience in arts

(Silvia & Barona, 2009). In research, the topic of aesthetic expertise is gaining increasing interest (Silvia, 2013) for several reasons. One reason, for example, is that expertise in arts has signififcant influences on outcomes that are specifically interesting for arts researchers (Silvia, 2013). Similar to aesthetic expertise is the construct of centrality of visual product aesthetics (CVPA), which was introduced by Bloch et al. (2003). CVPA represents a "continuous individual difference variable" (p. 5) and is defined "as the overall level of significance that visual aesthetics hold for a particular consumer in his/her relationship with products" (Bloch et al., 2003, p. 552). At high levels of CVPA, visual aesthetics heavily influences consumers' purchase intentions and usage of products (Bloch et al., 2003). CVPA is multidimensional and encompasses four related dimensions: personal and social value of design, design acumen, level of response, and design determinacy. Specifically, the dimension of design acumen was also discussed by Giese et al. (2014) who studied the aesthetic middle principle. Design acumen refers to the "ability to recognize, categorize, and evaluate product designs" (Bloch et al., 2003, p. 553). High design acumen consumers have a rich, readily accessible knowledge about designs and arts, leading to a more holistic processing (Bloch et al., 2003; Giese et al., 2014). Low design acumen consumers are lacking in such knowledge requiring more effortful processing. The constructs of involvement, knowledge, and expertise in arts are very closely related to CVPA including design acumen. For example, if a person is highly knowledgeable and involved in arts, high design acumen and high CVPA is likely. Thus, we will use the term *aesthetic expertise* to capture the commonalities of CVPA, design acumen, involvement, knowledge, learning, and training in arts.

Expertise, perceived risks, and decision-making. One way to explain how the aesthetic middle affects perceived risks and purchase intentions is to examine whether the aesthetic middle has the same effects on perceived risks and purchase intentions of experts and non-experts. Unquestionably, there are differences between experts and non-experts (novices). Silvia and Berg (2011) emphasized that a great amount of research has shown the differences in how experts and novices understand and experience arts. In fact, experts, compared to novices, evaluate arts differently (Hekkert & van Wieringen, 1996; Silvia, 2013), conceive arts more abstractly (Parsons, 1987), emotionally respond to arts differently (Locher, Smith, & Smith, 2001), prefer more complexity (e.g., Berlyne, 2013), and inspect arts differently according to eye-tracking technology (Locher, 1996). Further, compared to novices, experts find arts more pleasing and interesting, especially when it is challenging, complex, and abstract (e.g., Silvia & Berg, 2011).

Other studies showed that the level of expertise influences an individual's psychological processes (Petty et al., 1983). For example, a high level of expertise can allow simplifying consumers' decision-making, such that consumers can purchase and consume products with less effort and time (Alba & Hutchinson, 1987). In fact, with a high level of expertise, cognitive effort decreases and automaticity increases during the purchasing process. Further, the degree of confidence indeed varies with the level of expertise (Mitchell, 1999; Ross, 1975). Ross (1975) showed that the farther along the 'learning curve' consumers are, the more confidence they possess and the 'less inclined' they will be to seek information for their decision making. Clearly, when consumers are experts, they are highly involved and are more knowledgeable, resulting in a higher confidence in their domain of knowledge. In other words, having a high

level of expertise leads to greater self-confidence during the purchase task, positively influencing consumer response and behaviors.

Another difference between experts and non-experts in decision-making has been pointed out by Silvia (2013): due to training in arts, experts are more similar to each other than novices, because experts share arts-specific knowledge and constructs. Experts as a group share "art-specific conceptual knowledge of periods, theories, styles, techniques, and criticism" (Silvia, 2013, p. 108). On the contrary, novices generally lack such knowledge and, thus, apply general knowledge and subjective experiences when judging arts (Silvia, 2013). Silvia (2013) concluded, that the judgments of experts are aesthetic, but the judgments of novices are personal, and hence more subjective. Other researchers supported Silvia's (2013) approach and findings. For example, Hekkert and van Wieringen (1996) named experts 'curators and critics' and novices 'experienced amateurs' by finding that experts agreed on their arts judgment, whereas novices exercised a very personal judgment (Silvia, 2013).

Aesthetics theory provides explanations for differences between experts versus novices. For example, Berlyne (1971) introduced the variable of change and its cognitive dimension, which relates in a broader sense to knowledge. Knowledge includes information, experience, and skills. Novelty, perceptions of variety, and complexity, represent any mismatch between past and present experience – between what has been known and what is known (Bruni, 2007). Any change, such as an increase or decrease in the gap between accumulated knowledge and new knowledge can affect the pleasantness of a given experience (Bruni, 2007). For example, learning a new language may first seem threatening, but as the novel becomes familiar, the pleasure increases and the comfort level rises. Berlyne (1974) found that experts, relative to non-

experts, prefer more complexity. This is consistent with many other researchers' findings. For example, Rogers (1983) found that innovators, who are experts in their field, prefer novel, mentally challenging, and unfamiliar products. In contrast, laggards, who are the last to adopt an innovation, and thus constitute non-experts in the field, prefer simpler products (Rogers, 1983). To summarize, there are known differences between experts and non-experts in terms of their product preferences: relative to experts, non-experts prefer simple designs.

As mentioned above, consumers' expertise level influences psychological processes (Petty et al., 1983). Risk perceptions are formed through individual's psychological processes and thus, research relates expertise to perceived risks. Also, involvement has been often related to perceived risks. Previous researcher also linked perceived risk to involvement with a brand, known as brand loyalty, which has been shown to be a major risk reducer (Roselius, 1971), such that when consumers are involved with a brand and trust a brand, perceived risks are reduced. However, there is also an opposite perspective regarding the relationship between perceived risks and involvement. Perceived risks have been conceptualized as an intrinsic part of consumers' involvement (Mitchell, 1999) and argued to be an antecedent of involvement (Choeffe & McLeod, 1973; Mitchell, 1999). For example, if the risk of losing money is high, consumers are more involved in a product purchase. However, this perspective views involvement as situational involvement. Few researchers argued that situational involvement and perceived risks are positively related (Dholakia, 2011; Hong, 2015; Venkatarman, 1989) implying that the more situationally involved a consumer is with a product, the more likely higher risk perceptions will arise (Hong, 2015). However, the present research explores the moderating effect of consumers' expertise, which can be compared to enduring involvement, rather than situational involvement.

Consumers with a high expertise are not only situationally involved, rather show enduring involvement (Dholakia, 2001). This view is different from exploring situational involvement as an antecedent or consequence of perceives risks. Yet, considerable evidence from previous research suggests that consumer involvement, and thus, the level of expertise, are closely related to consumers' risk perceptions (Choeffe & McLeod, 1973; Dholakia, 2011; Hong, 2015; Mitchell, 1999; Venkatarman, 1989).

Previous research showed that some people are more risk averse than others (e.g., Mitchell, 1995) by showing that individual differences influence consumers' risk perceptions related to decision making. In 1972, Grønhaug proposed that consumers' previous experience with a product affect their risk perceptions. The assumption is based on the fact that previous encountering with a product or product purchase resulted in some form of learning, in turn leading to declined perceived risks by redemption (Grønhaug, 1972). Other researchers explored the relationship between the constructs of familiarity and perceived risks. For example, Dahl, Manchanda, and Argo (2001) indicated that the feeling of unfamiliarity increases the effect of psycho-social factors on consumers' behavior. Consumers, who feel unfamiliar with a product or situation, are likely to perceive higher risks. This perspective is appropriate for understanding risk perceptions in the context of retail purchase. Certainly, the lack of product involvement, and confidence often exhibited by non-experts can be a driver of risk perceptions. For example, if consumers feel a lack of product involvement and lack of confidence, they are likely unsure about their product choice, and therefore may be more concerned about other's opinions.

Building on previous evidence, it can be expected that the level of aesthetic expertise has a strong influence on consumers' response and behaviors, and thus will moderate the relationship

between design aesthetics and risk perceptions and purchase intentions. Based on the above discussion the following hypotheses are proposed:

H6: *The effect of design aesthetics (low, moderate, high) on risk perceptions [a) psycho-social, b) functional, and c) financial risk perceptions] associated with a product will be moderated by the consumer's level of aesthetic expertise (high vs. low).*

H7: *The effect of design aesthetics (low, moderate, high) on purchase intentions will be moderated by the consumer's level of aesthetic expertise (high vs. low).*

Processing when aesthetic expertise is low. Consumers use visual information to simplify their decisions-making processes. It takes only a few milliseconds (Frijda, 2006) for consumers to evaluate designs. This process often happens unconsciously. Product design can be viewed as a heuristic that consumers apply to simplify product judgments (Cox & Cox, 2002). Previous research has shown that consumers with little knowledge or limited information about a product often use visual information to simplify their decisions-making processes (Giese et al., 2014). Indeed, it has been shown that shortcuts like design cues guide the behavior of non-experts. However, product design in general will not always make the decision easier. Extreme designs such as highly attractive designs or qualitatively high designs may initially attract consumers' attention. However, not all consumers possess the ability and motivation to process such extreme design information. For this reason, after a brief moment of processing the design information,

non-experts will likely feel overwhelmed by trying to understand the extreme design and lose the motivation to process this information further (Kumar & Garg, 2010).

Indeed, Rogers and Ventakarman (1991) found that consumers differ in the mental processes when responding to new products. Non-experts may lack prior exposure to the product and may not have the ability and the motivation to process the extreme design. Further, non-experts may feel overwhelmed by trying to understand extreme design, because they lack access to the appropriate knowledge structures required to understand the extreme stimulus. Stimuli with less information are easier to process, and thus are more pleasing (Reber et al., 2004). According to Reber et al. (2004) the level of expertise can be linked to the ease of processing. Since non-experts lack available knowledge structures, high design is likely to result in slow-processing. Slow and effortful processing can signal that the stimulus might be harmful (Reber et al., 2004). Thus, high designs can lead to high perceived risks for non-experts. Berlyne suggested that a complex stimulus can create an uncomfortably high level of uncertainty (Cox & Cox, 2002). This uncertainty often becomes the source of risk perceived by consumers (Hong & Cho, 2011). Indeed, the feeling of unfamiliarity of non-experts can increase perceived risks (Dahl, Manchanda, & Argo, 2001) and decrease their approach behavior.

Contrary to high and complex designs, non-experts have the ability to process low design aesthetics easily. Yet, for non-experts, designs should not be too simple, as rudimentary designs can lead to a lack of arousal (Berlyne, 1974). Thus, non-experts are likely to dislike low design aesthetics, because such low designs are not stimulating, resulting in boredom (Berlyne, 1974). For non-experts, it can be expected that low designs result in high-risk perceptions and low purchase intentions. For example, when an unfamiliar consumer intends to buy a suit for a new

job and encounters a set of suits, the consumer may have different concerns regarding the design and styling of the suit. On the one hand, when the suit is too simple, the consumer may fear that the styling is too low and the risk of being underdressed. On the other hand, when the suit is highly-fashionable, the consumer may perceive high risks regarding the reaction of his colleagues to the suit and the risk of being overdressed. At the end, the unfamiliar consumer may choose a suit which is not too fashionable, but also not too simple, resulting in the purchase for the aesthetic middle, because the middle encompasses the lowest risk for the unfamiliar consumer.

Many previous studies have showed that consumers who are not familiar with the given product information respond most favorably to the aesthetic middle design (Giese et al., 2014). For example, Giese et al. (2014) explored the effect of individual difference variables in relation to aesthetics. They investigated the outcome of the aesthetic middle effect for more and less informed consumers. In other words, they studied if more informed, more knowledgeable consumers perceive the aesthetic middle differently than less informed, less knowledgeable consumers. Giese et al. (2014) found that aesthetic middle designs result in the most favorable purchase intentions among less informed consumers. Their finding is consistent with other researchers' findings, such that moderate designs result in most favorable responses for non-experts (e.g., Berlyne, 1974). Further, Giese et al. (2014) investigated the aesthetic middle effect for consumers with high and low design acumen. Specifically, the researchers explored if aesthetic middle designs lead to the most favorable purchase intentions for consumers with low design acumen as compared to consumers with high design acumen. Consumers with low design acumen can be compared to non-experts. Non-experts, equally to consumers with low design

acumen, are likely to lack in the "ability to recognize, categorize, and evaluate product designs" (Bloch et al., 2003, p. 553). However, Giese et al. (2014) did not find support for their proposed aesthetic middle effect and low acumen design consumers. One reason for their non-supportive finding may be the selected sample; the researchers used a homogenous population of only female college students. Thus, it is important to explore if their finding can be generalized, or if the aesthetic middle effect indeed works only for consumers with low design acumen as compared to consumers with high design acumen.

In summary, based on previous findings, it can be expected that non-experts lack the ability and motivation to process extreme designs, but have the skills to process moderate designs. When processing a moderate design, non-experts may experience an act of discovery or insight, which can in turn produce satisfaction. Thus, it can be expected that for low design expertise, designs that look 'normal' and are closer to the aesthetic middle as compared to low or high designs will result in the lowest risk perceptions and highest purchase intentions due to the strong aesthetic pleasure resulting from processing expectations. Thus, this research proposes the following:

H8: For consumers with low design expertise, moderate design aesthetics will lead to lower risk perceptions [a) psycho-social, b) functional, and c) financial risk perceptions] associated with a product than 1) low or 2) high design aesthetics.

H9: For consumer with low design expertise, moderate design aesthetics will lead to higher purchase intentions than a) low or b) high design aesthetics.

Processing when aesthetic expertise is high. Silvia and Barona (2009) suggested that experts' preferences are less affected by specific stimulus features. However, when the familiar becomes 'old' and non-stimulating (Bruni, 2007), it can induce boredom. Further, even though ease of cognitive processes can signal that the stimulus is familiar, and hence is unlikely to be harmful (Reber et al., 2004), when encountering very simple or moderate designs, experts may perceive higher risks due to low arousal and boredom induced by the stimulus. For example, experts may feel that simple designs can be harmful by reducing their social status or not matching their design and, thus, resulting in higher psycho-social risk perceptions. Indeed, previous research pointed out that experts may experience a risk of acquiring a product that they find less enjoyable than expected (Reber et al., 2004). For experts, acquiring a simple designed product may have less enjoyable consequences than expected. For example, when a high fashionable consumer encounters a very simple, low-styled product, uncertainties of whether the product fits the high-fashioned lifestyle and uncertainties regarding the reaction of the social environment may arise and thus, purchase intentions will be decreased. Previously, researchers have suggested that experts are more likely to consider aesthetic value, the ideas behind the work, and the norms of 'good' and 'bad' taste (Leder et al., 2004). Experts thus are likely to evaluate simple stimuli more negatively even though the easy processing that is accompanied by pleasure (Leder et al., 2004).

Will moderate aesthetic design qualities stimulate experts? Previous research revealed that the aesthetic middle effect did not occur for experts (Giese et al., 2014). Indeed, expertise weakens the positive impact of moderate aesthetic qualities. Giese et al. (2014) showed that the

aesthetic middle design as compared to other design options did not achieve highest ratings for more familiar consumers. Also, other researches showed that high-involved consumers do not necessarily prefer moderate qualities to extreme ones. For example, Peracchio and Tybout (1996) found that the preference for the moderate option did not occur for consumers with high product knowledge. These findings reflect the likelihood that experts, who have the schema to understand high designs, will not necessarily choose and prefer the moderate option. Experts are likely to successfully recognize a product with high design aesthetics and process it error-free, or have the access to the appropriate knowledge structure to understand it. Furthermore, experts will likely experience an ease of processing when encountering a high design and may enjoy the 'problem-solving-task' for complex stimuli, such that when processing is expected to be difficult, but turns out to be easy, a strong aesthetic pleasure will result (Reber et al., 2004). Indeed, previous research found that experts prefer novel, mentally challenging, and unfamiliar products (Rogers, 1983). Given that previous studies showed that the aesthetic middle effect did not apply to experts, it is likely that experts will perceive higher risks for moderate designs as compared to high designs. According to Grønhaug (1972), consumers with high self-confidence are more likely to trust their own ability in decision-making and, thus, are likely to perceive low risk when evaluating high designs. Based on previous findings, it can be expected that experts will perceive less risk and greater purchase intentions when evaluating high design aesthetics as compared to low or moderate. This proposition is tested in the following hypotheses:

H10: For consumers with high design expertise, high design aesthetics will lead to lower risk perceptions [a) psycho-social, b) functional, and c) financial risk perceptions] associated with a product than 1) low or 2) moderate design aesthetics.

H11: For experts, high design aesthetics will lead to higher purchase intentions than a) low or b) moderate design aesthetics.

Product confidence. Consumer confidence is the "consumer's own perceived ability to accurately judge the outcome levels they have experienced" (Barach, 1969; Bennett & Harrell, 1975; Deering & Jacoby, 1972; Mitchell, 1999, p. 172). In other words, consumer confidence describes the extent to which a consumer feels able to and confident with respect to own marketplace decisions and behaviors (Bearden, Hardesty, & Rose, 2001; Paridon, 2006). Cox (1967) introduced the term 'confidence value', which is a measure of how confident consumers are when categorizing a product. Thus, consumers' confidence value includes the consumers' perceived ability to correctly judge the outcome (Deering & Jacoby, 1972; Mitchell, 1999). In consumer behavior literature, two types of confidence have been identified: general and specific confidence (Mitchell, 1999). General confidence is the extent of confidence or self-esteem a person has in any situation, whereas specific confidence is the extent of confidence a person has when making a specific purchase decision (Mitchell, 1999). For the variable of confidence, this research concentrates on specific confidence, which will be related to the confidence gained through available or absent consumer product ratings during the purchasing decision. Further, the

variable will be labeled *product confidence* to clarify the type of confidence this study is focusing on.

Product confidence, risk perceptions, and purchase intentions. Studies showed that the level of confidence influences an individual's responses and behaviors (Mitchell, 1999). Further, it was argued that consumer studies can be enhanced by considering the effect of consumers' confidence level on their risk perception (Mitchell, 1999). One way of understanding perceived risks and purchase intentions in relation to product confidence is to question the source of consumers' perceived risks. For this reason, Mitchell (1999) discussed the question "where does the uncertainty come from?" (p. 172). Mitchell (1999) introduced several sources including consumers' knowledge uncertainty, predictive validity, and confidence value. Knowledge uncertainty can be described as the uncertainty regarding what is known about the alternatives. Predictive validity includes consumers' concerns about the predictive validity of the product attributes that can be assessed prior to the purchase. Consumers' confidence value can be described as a measure of how confident consumers are when categorizing a product (Cox, 1967; Mitchell, 1999). According to Mitchell (1999), consumer's confidence value is related to consumers' risk perceptions.

Bauer (1970) drew the connection between consumer confidence and perceived risks by discussing that one possibility of coping with risk and enable consumers to act with confidence in their decision-making is to seek information. According to Bauer (1970), to increase the confidence level, consumers can use several sources of information. One such source is consumer dominated and can be characterized as word of mouth advertisement and includes interpersonal communication (Grønhaug, 1972). Previous researches have shown that consumer

dominated information is perceived as more credible and easier to evaluate as any other source (Grønhaug, 1972). Further, the level of confidence can vary with the product information available given that the feeling of having product information available can lead to a more confident behavior (Bauer, 1970). Clearly, when product information is available, consumers feel more involved and more knowledgeable, resulting in a higher confidence in their decision-making. Further, consumers with high confidence feel less inclined to seek for informative cues to simplify their decision-making (Ross, 1975). Actually, consumers may experience an ease of processing when information is available (Peracchio & Tybout, 1996).

Kim and Lennon (2000) revealed that availability of product information positively affected the consumer decision-making process, such that when product information was available, consumers purchase intentions increased and consumers perceived risks decreased (Han, 2006). However, when product information is missing, consumers may feel less knowledgeable and may experience a lack of confidence (Ross, 1975), which will eventually lead to higher uncertainties in their decision-making. For example, when a consumer shops online for a mixer, but no other consumer has rated the product yet, the consumer is likely to feel less confident at that moment in making a purchasing decision due to the absence of product review information. On the other hand, if others have rated the product positively, the consumer may have higher confidence in the product in that moment relying on the available information. Bettman (1973) argued that consumers' perceived risks vary with consumers' confidence, such that "... the risk inherent in a brand choice situation within a product class will depend upon the degree to which a buyer believes he can construct a reasonable decision rule for making a brand choice, and the importance to him of making a satisfactory choice within that product class"

(Bettman, 1973, pp. 184-185). Hirsch, Dorndorf, and Kernan (1972) found the relationship between specific confidence and perceived risks to be asymptotic. As consumers' specific confidence increases, their perceived risk decreases, but then levels off (Mitchell, 1999). Therefore, confidence decreases perceived risks (Mitchell, 1999). Indeed, consumers with a high degree of confidence in a product are less inclined to perceive risks associated with the product (Grønhaug, 1972) and are more likely to show an approach behavior.

In this study, we consider the availability of product review information as a source of product confidence in relation to a product's design aesthetics, perceived risks, and purchase intentions. To summarize, it can be expected that the level of product confidence is likely to moderate the relationship between design aesthetics, risk perceptions, and purchase intentions. The preceding developments and findings allow proposing the following:

H12: The effect of design aesthetics (low, moderate, high) on risk perceptions [a) psycho-social, b) functional, and c) financial risk perceptions] associated with a product will be moderated by product confidence (high vs. low).

H13: The effect of design aesthetics (low, moderate, high) on purchase intentions will be moderated by product confidence (high vs. low).

Processing with low product confidence. Previous researches showed that when consumers perceive high uncertainties with a product, they seek more product information to reduce the risk (Grønhaug, 1972). For example, Dowling (1986) showed that consumers who

perceived high risks tend to engage in more information-seeking activities (Mitchell, 1999). Indeed, when confronted with an unfamiliar product, risk perceptions are likely increased resulting in an information-seeking activity. However, if no information is available, consumers are likely to feel less confident in approaching the product. This lack of confidence due to the absence of product information may lead consumers to use a risk reducing strategy. One such risk reducing strategy is choosing the moderate design option. In other words, when consumer confidence is low, consumers are likely to choose the aesthetic middle to reduce their risks.

Indeed, previous researchers showed that consumers trade-off their needs when they have uncertainties. For example, Chitturi, Raghunathan, and Mahajan (2007) showed that a trade-off of hedonic and utilitarian needs exists, when consumers are not sure about the functional qualities of the product. When no product information regarding the functional qualities is available, consumers can make trade-offs on the hedonic needs by choosing the aesthetic middle. This trade off and choice for the middle can be seen as consumers' risk reducing strategy (Campbell & Goodstein, 2001). Hagdvet and Patrick (2014) also discussed this hedonic and functional trade-off. They showed that when products' functionality is below a certain level, only the aesthetics of a product couldn't offset negative consumer responses. Hagdvet and Patrick (2014) discussed that no matter how good a product looks, it first needs to be functional. Their findings show that styling of products is seen as unnecessary and irrelevant in a product that does not function well (Hagdvet & Patrick, 2014). Thus, when functional needs are not met, high designs are undesired. However, consumers may not be willing to completely trade-off on hedonic needs by choosing the lowest design option, but may be willing to make trade-offs to a specific point by choosing the aesthetic middle. Therefore, when consumers lack in confidence due to the lack of product review information, perceived risks may be lowest and purchase intentions may be highest for moderate designs as in comparison to high or low designs. Therefore, we will hypothesize the following:

H14: When product confidence is low, moderate design aesthetics will lead to lower risk perceptions [a) psycho-social, b) functional, and c) financial risk perceptions] associated with a product than 1) low or 2) high design aesthetics.

H15: When product confidence is low, moderate design aesthetics will lead to higher purchase intentions than a) low or b) high design aesthetics.

Processing with high product confidence. Previous researches revealed that one way of reducing risk is to increase the confidence that the product will not fail (Mitchell, 1999). Mitchell and Golrick (1996) argued that this is the most common approach to increase certainty. This approach can be used to understand the trade-off between consumers' functional and hedonic needs (Chitturi, Raghunathan, & Mahajan, 2008). Chitturi et al. (2007) revealed that consumers attach greater importance to a product's hedonic dimension as compared to utilitarian dimension, but only after a certain level of functionality is met. In other words, before considering hedonic product features, consumers depend on product information confirming that the product functions well, which allows decreasing risk perceptions associated with the product. Prior research that explored the relationship between consumers' hedonic and utilitarian needs showed when a product exceeds utilitarian expectations it only evokes satisfaction, but when it exceeds hedonic expectations it evokes delight (Chitturi et al., 2008). However, exceeding only hedonic expectations is not enough for a product to be successful- it first needs to function well (Hagdvet & Patrick, 2014). Hagdvet and Patrick (2014) also studied aesthetics in relation to functionality

and argued that high product styling can actually hurt a product, given that a high level of styling leads to lower perceived functionality. However, when product information confirming the functionality of the product is available, high aesthetics indeed can be successful.

Certainly, the availability of product information helps consumers to manage perceived risks (Hong, 2015). When product confidence is high, risks will be decreased. For example, when a consumer has a set of choices for a new camera: one very functional designed, but not aesthetic pleasing model, and one less functional, but very aesthetically pleasing designed model. If no product review information confirming the functionality of the cameras available, the consumer may rather choose the functionally designed camera ensuring its functionality. However, if additional information confirming the functionality of the camera is available, the consumer may not feel an urge to trade-off between hedonic versus functional attributes and can choose the aesthetically pleasing designed camera without any functionality concerns. In other words, when the functionality of a product with high aesthetics is confirmed, high product confidence can decrease perceived risks and increase approach behavior.

To summarize, high consumer confidence from product review information can allow consumers to approach high design aesthetics over the middle or low design options without increased perceived risks. Based on the above discussion, we will hypothesize the following:

H16: When product confidence is high, high design aesthetics will lead to lower risk perceptions [a) psycho-social, b) functional, and c) financial risk perceptions] associated with a product than 1) low or 2) moderate design aesthetics.

H17: When product confidence is high, high design aesthetics will lead to higher purchase intentions than a) low or b) moderate design aesthetic.

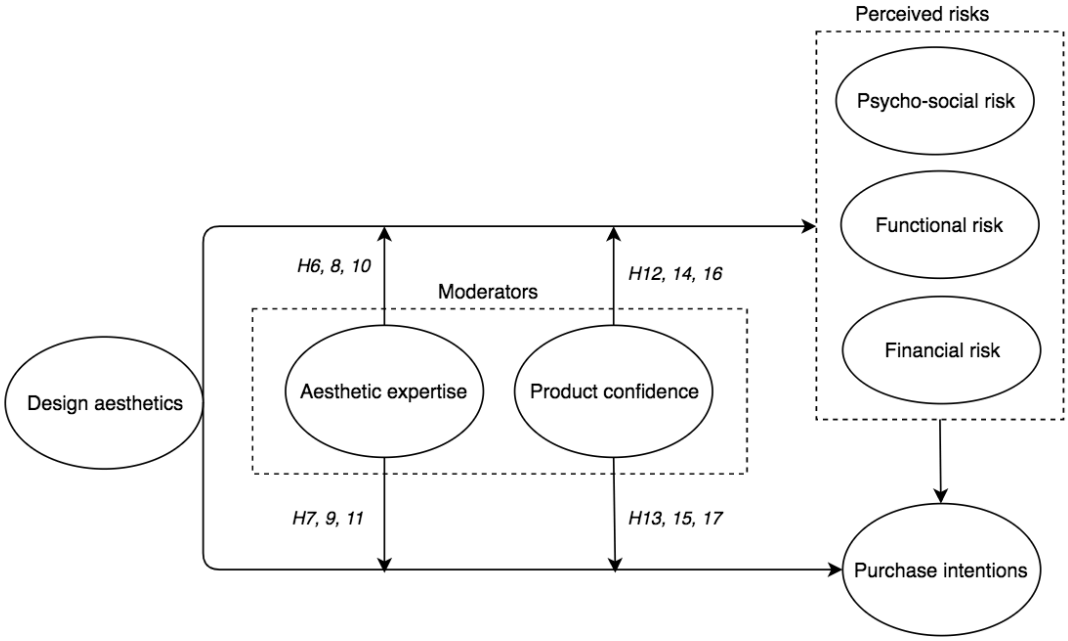


Figure 2. The conceptual framework of model 2.

CHAPTER III. PRETESTS

This chapter provides an overview of the two pretests conducted with the objective of selecting appropriate stimuli for the main study and testing the manipulation and measurement of product confidence.

Research Design

Prior to the main quasi-experimental study, two pretests were conducted to develop the stimuli manipulating the independent variable (design aesthetics) and the moderating variable (product confidence) for the main study and to evaluate validity and reliability of the measurements in the questionnaire. The first phase of the research process was conducted after receiving permission from the Institutional Review Board (IRB) to study human subjects (APPENDIX A). Following approval from the IRB, the participants for the pretests were recruited using a non-probabilistic convenience sample.

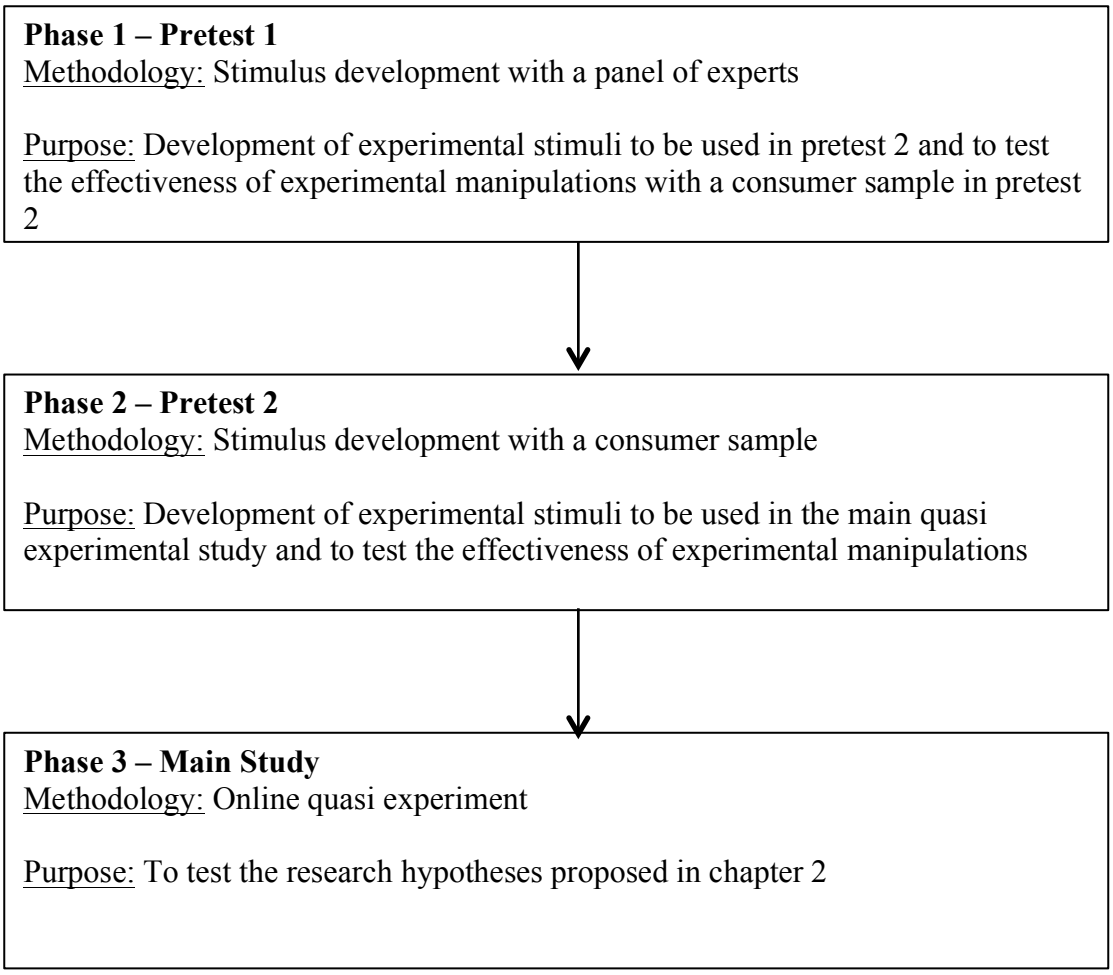


Figure 3. Flow chart describing the research process.

Pretest 1 – Stimulus Development

The objective of pretest 1 was to select stimuli that represent an effective manipulation of low, moderate, and high levels of design aesthetics. The stimuli selected based on the results of pretest 1 were further narrowed down in pretest 2.

Sample and Data Collection Procedure

An expert panel pretest including female professors and female graduate students with a background in design from the Department of Consumer and Design Sciences from a southern University was asked to rate design aesthetics (low, moderate, high) of various products. The sample of pretest 1 was a non-probabilistic convenience sample, consisting of 18 aesthetic experts (three professors and 15 graduate students). In total 72 products (24 watches, 24 coffee makers, and 24 chairs) were evaluated in pretest 1 (three levels of design aesthetics for eight products of each product category, e.g., eight high, eight moderate, and eight low design chairs). In order to minimize the numbers of stimuli rated by each participant, each participant was randomly assigned to two product categories, such that each participant rated 48 stimuli in total. The expert panel first saw verbal descriptions and visual examples (photographs) of products with high versus low design (APPEDIX B). For high design aesthetics, participants read the following instructions: “On the next page are examples of products with high design. These designs are beautiful, provide sensory pleasure, and have a WOW factor. Please have a close look at these pictures”. For low design aesthetics, participants read the following instructions: “On the next page are examples of products with low design. These designs are low in beauty and sensory pleasure, and lack the WOW factor. Please have a close look at these pictures.”

These verbal descriptions were followed by four visuals of high versus low product designs, which were awarded with the Red Dot Award: Product Design (https://en.red-dot.org). This award appraises the best products with exceptional high design quality. Then, participants were asked to rate 48 different products on a continuum from low to high design based on the previous descriptions of high and low designs, in the pages that followed.

Stimuli Selection

The stimuli were professionally prepared pictures of three different product types (women's watches, chairs, and coffee makers). These product types were chosen for several reasons: 1) they can be displayed and presented in a clearly organized and easily understood form; 2) they are not affected by garment size or fit problems such as clothing; and 3) women watches are gender-specific and represent hedonic product categories, coffee makers are gender neutral and represent functional categories, whereas chairs are gender-neutral as well, but are between hedonic and functional product categories. On each product, price and brand information were removed to ensure that these factors did not impact consumers' responses. For each of the three product types, this study followed Hung and Chen's (2012) approach in selecting the stimuli. For example, for the product type of chairs: the stimuli selected for pretesting were chosen from the book 1000 chairs (Fiell & Fiell, 1997) on the basis of using a 'typical chair' as a reference. Chairs that seemed not to fit in the category of a chair and could be more likely perceived as a bench, office chair, or sofa were eliminated (Hung & Chen, 2012). Next, two design experts examined the remaining chairs and chose eight chairs with high design, such as chairs with a highly complex, innovative, and novel shapes and eight chairs each for low and moderate design. This approach was repeated for each product type.

The stimuli selection procedure resulted in three design levels for each product type and a total of 72 stimuli (e.g., eight low design chairs, eight moderate design chairs, and eight high design chairs). Pretest 1 then confirmed whether the stimuli selected reflected effective manipulations of low, moderate, and high design aesthetics. When presenting the stimuli, the following controls were employed: 1) brand information was removed and 2) designs that do not reveal the brand were selected to ensure that the brand did not influence the responses on the pretest; 3) high-resolution stimulus images that are consistent in size (7cm x 7cm, 300 dpi) were used; and 4) a consistent white or light grey background was used for all images.

Measurements

A 7-point semantic differential scale (1= low design, 4 = moderate design, 7 = high design) measured design aesthetics of the products.

Results

A total of 72 mean scores were reviewed to choose the best representation of manipulations of low, moderate, and high design aesthetics. Results indicated that for chairs, the low-high design aesthetics means ranged from 1.14 to 6.86, which was a very good representation on a 1 = low design aesthetics to 7 = high design aesthetics scale (Table 1). For women's watches, mean scores ranged between 1.63 and 6.5 and for coffee makers mean scores ranged between 1.33 and 5.89. A total of 36 stimuli, four out of the eight stimuli per design level of coffee makers, women's watches, and chairs, with the best manipulations of high, moderate, and low design aesthetics (closest to high, medium and low ratings on the 7-point scale), were selected (Table 4).

Table 1

Mean Scores for all Chairs from Pretest 1

Low Design Aesthetics	Moderate Design Aesthetics	High Design Aesthetics
 *M* = 1.14	 *M* = 3.86	 *M* = 5.71
 *M* = 1.29	 *M* = 3.86	 *M* = 5.71
 *M* = 2.00	 *M* = 4.57	 *M* = 6.29
 *M* = 2.57	 *M* = 4.43	 *M* = 6.57

Table 1 (continued)

Low Design Aesthetics	Moderate Design Aesthetics	High Design Aesthetics
 *M* = 1.86	 *M* = 4.43	 *M* = 5.29
 *M* = 2.86	 *M* = 4.71	 *M* = 6.71
 *M* = 3.71	 *M* = 6.00	 *M* = 6.71
 *M* = 4.43	 *M* = 6.43	 *M* = 6.86

Table 2

Mean Scores for all Watches from Pretest 1

Low Design Aesthetics	Moderate Design Aesthetics	High Design Aesthetics
 *M* = 1.63	 *M* = 3.00	 *M* = 4.88
 *M* = 1.88	 *M* = 3.25	 *M* = 5.00
 *M* = 2.13	 *M* = 3.63	 *M* = 5.50
 *M* = 2.13	 *M* = 3.88	 *M* = 5.5

Table 2 (continued)

Low Design Aesthetics	Moderate Design Aesthetics	High Design Aesthetics
 *M* = 2.13	 *M* = 4.25	 *M* = 5.75
 *M* = 3.13	 *M* = 4.25	 *M* = 6.13
 *M* = 4.63	 *M* = 4.38	 *M* = 6.25
 *M* = 5.63	 *M* = 4.63	 *M* = 6.50

Table 3

Mean Scores for all Coffee Makers from Pretest 1

Low Design Aesthetics	Moderate Design Aesthetics	High Design Aesthetics
		
M = 1.33	*M* = 3.11	*M* = 5.11
		
M = 1.56	*M* = 4.00	*M* = 5.89
		
M = 1.78	*M* = 4.33	*M* = 5.22
		
M = 2.11	*M* = 4.33	*M* = 5.56

Table 3 (continued)

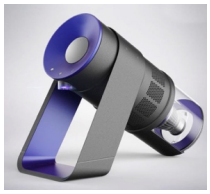
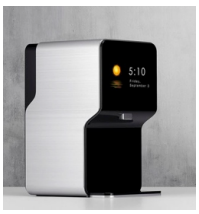
Low Design Aesthetics	Moderate Design Aesthetics	High Design Aesthetics
		
M = 2.22	*M* = 4.78	*M* = 5.67
		
M = 2.22	*M* = 4.78	*M* = 5.78
		
M = 2.44	*M* = 4.89	*M* = 5.89
		
M = 2.67	*M* = 5.22	*M* = 5.89

Table 4

Mean Scores for all Stimuli from Pretest 1 that were Selected for Pretest 2

Level	Chairs	Coffee Makers	Watches
Low Design Aesthetic	 *M* = 1.14	 *M* = 1.33	 *M* = 1.63
	 *M* = 1.29	 *M* = 1.78	 *M* = 1.88
	 *M* = 1.86	 *M* = 2.11	 *M* = 2.13
	 *M* = 2.00	 *M* = 2.22	 *M* = 2.13

Table 4 (continued)

Moderate Design Aesthetics	 *M* = 3.86	 *M* = 4.00	 *M* = 3.88
	 *M* = 3.86	 *M* = 4.33	 *M* = 4.25
	 *M* = 3.71	 *M* = 4.33	 *M* = 4.25
	 *M* = 4.43	 *M* = 4.78	 *M* = 4.38

Table 4 (continued)

High Design Aesthetics	 *M* = 6.57	 *M* = 5.78	 *M* = 5.75
	 *M* = 6.71	 *M* = 5.89	 *M* = 6.13
	 *M* = 6.71	 *M* = 5.89	 *M* = 6.25
	 *M* = 6.86	 *M* = 5.89	 *M* = 6.5

Pretest 2 – Stimulus Development

The first objective of pretest 2 was to further narrow down the stimuli selected in pretest 1 that effectively manipulated the design aesthetics of products to be low, moderate, and high. Narrowing down the stimuli for the main study included selecting one product type out of three and to reduce the stimuli number per design aesthetics level. The second objective of pretest 2 was to ensure that the manipulation of product confidence based on product review information was successful. The third objective of pretest 2 was to validate the product confidence measurement. The stimuli selected based on the results of pretest 2 were used to manipulate design aesthetics and product confidence in the main study.

Sample and Data Collection Procedure

The sample for pretest 2 was drawn from the same sample pool as the subjects in the main study (the population of an American consumer research company panel list). The sample was a non-probabilistic convenience sample, consisting of 60 females. The participation in the pretest was voluntary; participants received a small compensation for participating in the study that was provided to them by the consumer research company. In order to allow for individual differences in aesthetic expertise within the sample, a panel company named Cint (www.cint.com) recruited the participants for the pretest according to their hobbies and interests in design and art. The goal was to achieve two groups with distinct levels of design and art interest. The low aesthetic expertise group was profiled based on the following sample selection criteria: 1) no hobbies or interests in arts and crafts, interior decorating and renovating, and photography; and 2) no subscriptions to magazines in the fields of arts and crafts, fashion, styles,

beauty, interior decorating and design. The high aesthetic expertise group was profiled based on the above selection criteria being present. This procedure allowed to pre-assign participants to two distinct groups with differing levels of design and art interest. Also, at the end of the pretest 2, participants were asked if they had any interest, education, and/ or occupation in the fields of arts and/ or design in general. This allowed ensuring that the participant selection by the panel company according to hobbies and interests indeed captured their aesthetic expertise. At the beginning of the pretest 2 questionnaire, participants were randomly assigned to an either low or high product confidence condition manipulated through high versus low product review star ratings (APPEDNDIX C). Participants saw three different products with product information in the form of high versus low product review star ratings of consumers (one group saw low product review star rating and the other group saw high product review star rating). Then, they were asked to rate their product confidence in the product displayed.

Next, participants rated 36 products with differing levels of design aesthetics, which were selected in pretest 1 (Table 2), presented in a random order. But first, like pretest 1, the participants read verbal descriptions and saw visual examples (photographs) of products with high versus low design. For high design aesthetics, participants read the following instructions: "On the next page are examples of products with high design. These designs are beautiful, provide sensory pleasure, and have a WOW factor. Please have a close look at these pictures". For low design aesthetics, participants read the following instructions: "On the next page are examples of products with low design. These designs are low in beauty and sensory pleasure, and lack the WOW factor. Please have a close look at these pictures". These verbal descriptions were followed by four visuals of high versus low designs. Then, participants were asked to rate

36 different products on a continuum from low to high design based on the previous verbal and visual descriptions of high and low designs, in the pages that followed. Two attention-check questions were implemented right at the beginning of the survey to ensure that participants carefully read and understood the classification of low versus high design aesthetics. The screening out question asked participants to classify two visual examples of design aesthetics, presented on the previous page. If participants failed to classify the products, they were screened out and if the task was completed successfully, they were redirected to rating the following 36 stimuli. During the stimuli-rating task, two more screening out questions were implemented where participants were asked to select a specific number on a scale from one to seven. When the correct number was selected, participants could continue with their task and if they failed, they were screened out. This allowed to ensure that participants carefully read the questions and paid attention to their rating. Then participants were asked to rate their perceived design knowledge and ability to correctly classify the stimuli seen followed by demographics questions.

Stimuli Selection

Pretest 2 used three product types with three levels of design aesthetics resulting in a total of 36 stimuli (twelve watches, twelve chairs, and twelve coffee makers). Based on the ratings from pretest 2, these stimuli were further reduced to one product type with two stimuli at each design aesthetics level (total of 6 stimuli) for the main study.

Product confidence was manipulated through product review rating. In the ‘high’ product confidence condition, participants saw five yellow stars with information in brackets that hundreds of consumers have rated the product. In the ‘low’ product confidence condition, five

grey (instead of yellow) stars with information in brackets that no consumer has rated the product yet were displayed next to the stimuli.

Measurements

A 7-point semantic differential scale (1= low design, 4 = moderate design, 7 = high design) measured design aesthetics of the products. Product confidence was operationalized by manipulating the availability of the consumer product review start ratings. A five item 7-point Likert-type scale measured product confidence. An example of the items is "based on the product reviews, I am confident that this product will perform well" and "based on the product reviews, I am confident in my choice of this product" (see Table 5). Participants' perceived design knowledge and ability to rate the products was measured by three sematic differential scale items including the following pairs "unknowledgeable – knowledgeable, unqualified – qualified, not an expert – an expert".

Table 5

Measurements for Pretests

	Goal	Variable	Measures
Pretest 1	Selection of appropriate Stimuli	Design Aesthetics	The design of this product is: Low (1) – moderate (4) – high (7)
Pretest 2	Selection of appropriate Stimuli	Design Aesthetics	The design of this product is: Low (1) – moderate (4) – high (7)
		Product Confidence	a) Based on the product reviews, I am confident that this product will perform well. b) Based on the product reviews, I am confident in my choice of this product. c) Based on the product reviews, I am confident to make an informed purchase decision. d) Based on the product reviews, I am confident that this product is what I am looking for. e) Based on the product reviews, I am confident that there is nothing wrong with this product.

Data Analysis and Results

A total of 60 females participated in the online questionnaire. The entire data collection process lasted one week. Seventeen cases were determined unusable and thus deleted because participants were screened out early due to failing to complete the attention-check questions successfully.

Demographics. The demographic characteristics of the sample in pretest 2 were analyzed using descriptive statistics, specifically frequencies in SPSS (Table 6). The sample consisted of 43 females. In terms of ethnicity, 65.1% of the participants were Non-Hispanic White (Caucasian American), 25.6% Hispanic, 4.7% Asian/ Pacific Islander, and 4.7% Non- Hispanic Black (African American). Participants' age ranged from 20 to 39 years with 83.7% of participants

aged between 30 – 39 years. Participants' annual household income ranged from below $15,000 to $90,000 with a majority of 37.2% of participants earning between $75,000 and $90,000. In terms of education, 44.2% of participants earned a Master's degree and 25.6% Bachelor's degree. The sample's location within the U.S. was equally distributed between west, south, midwest, and northeast.

Table 6

Sample Characteristics for Pretest 2

		n	%
Occupation	(N= 43)		
	Professional	29	67.4%
	Homemaker	7	16.3%
	Service Worker	2	4.7%
	Student	2	4.7%
	Other	2	4.7%
	Skilled Labor	1	2.3%
	Retired	0	0.0%
Residence in USA (N= 43)			
	South	13	30.2%
	Midwest	11	25.6%
	West	10	23.3%
	Northeast	9	20.9%
Annual Household Income (N= 43)			
	< $15,000	3	7.0%
	$15,000 - $24,999	2	4.7%
	$25,000 - $34,999	1	2.3%
	$35,000 -$49,999	6	14.0%
	$50,000 - $74.999	8	18.6%
	$75,000 - %99,999	16	37.2%
	$100,000 +	7	16.3%
	Would rather not say	0	0.0%
Age	(N= 43)		
	20 – 29	7	16.3%
	30 – 39	36	83.7%

Table 6 (continued)

Education	(N= 43)		
	Master's Degree	19	44.2%
	Bachelor's Degree	11	25.6%
	Some College	9	20.9%
	High School Diploma	2	4.7%
	Associate Degree	2	4.7%
	Other	0	0.0%
	No High School Diploma	0	0.0%
	Doctorate Degree	0	0.0%
Ethnicity	(N= 43)		
	Non- Hispanic White (Caucasian American)	28	65.1%
	Hispanic	11	25.6%
	Non-Hispanic Black (African American)	2	4.7%
	Asian/ Pacific Islander	2	4.7%
	American Indian/ Alaskan Native	0	0.0%
	Other	0	0.0%

Scale reliabilities. The reliability, validity, and one-dimensionality of the product confidence measurement was assessed. Exploratory Factor Analysis (EFA), specifically Principal Components Analysis with Varimax Rotation, which allows items to load freely without constraints, checked the scale's dimensionality. The analysis revealed that product confidence is a one-dimensional variable. In order to reduce the length of the scale, two out of five items with the lowest loadings (item a and item c) were deleted. The number of items was reduced subsequently (Table 7).

Table 7

Factor Loadings for Product Confidence Scale in Pretest 2

	Factor Loadings
Product Confidence Scale Item	1
a) Based on the product reviews, I am confident that this product will perform well.	0.946
b) Based on the product reviews, I am confident in my choice of this product.	0.969
c) Based on the product reviews, I am confident to make an informed purchase decision.	0.930
d) Based on the product reviews, I am confident that this product is what I am looking for.	0.950
e) Based on the product reviews, I am confident that there is nothing wrong with this product.	0.972

To ensure the product confidence scale and expertise knowledge scale reliability, Cronbach's (1951) alpha was calculated and internal consistency checked. The calculated Cronbach's alpha were above 0.70 (Mitchell, 1996), thus revealing satisfactory reliabilities (Table 8) and internal consistency for both scales.

Table 8

Scale Reliability Pretest 2

Measures	Cronbach' s Alpha	N of Items	*N*
Expertise Knowledge	0.870	3	43
Product Confidence	0.973	3	43

Manipulation checks. One product type out of three (women's watches, chairs, and coffee makers) and two out of four stimuli of each design level with the best manipulations of high, moderate, and low design aesthetics ratings, were selected for the main study. Conducting paired samples *t*-tests determined if the differences between the three levels of designs (two levels at a time) were statistically significant. Table 9 shows all mean scores of the tested chair stimuli. Results of the manipulation checks showed that all three product types were successful manipulations of design aesthetics. Specifically, all three levels of design aesthetics significantly differed from each other, such that significant differences between the low and moderate, low and high, and moderate and high design aesthetics levels existed for each pair of stimuli. Additionally, the watch stimuli did not show differences in the same design level, whereas the mean scores of chairs and coffee makers also significantly differed in the same design aesthetics level for low and high levels (see Table 10). However, given that for all three categories the ratings in the low design aesthetic level were significantly lower than moderate ratings and ratings in high design aesthetics level were significantly higher than moderate ratings, the differences within the same level were considered acceptable. Even though the manipulations for all three product types were successful, only one product type was intended to be selected for the main study allowing a suitable length for the online questionnaire. Given that watches and coffee makers are mostly representative of hedonic and utilitarian product categories, respectively, chairs were selected as the category for the main study since they can be considered both hedonic and functional products. This selection would allow the results of the main study to generalizing to a wider range of products along the hedonic-functional continuum. Further, the product category of chairs was suitable for the sample of the main study consisting of women only, who

are the main shoppers for the household ("Statistics On The Purchasing Power Of Women", 2017). Table 9 and Table 10 show the six stimuli of chairs that were chosen for the main study.

Table 9

Stimuli Means Tested in Pretest 2

Chairs	Coffee Makers	Watches
		
M = 1.07	*M* = 2.20	*M* = 1.81
		
M = 1.46	*M* = 2.86	*M* = 2.04
		
M = 1.97	*M* = 4.18	*M* = 3.56
		
M = 2.21	*M* = 3.46	*M* = 3.33

Table 9 (continued)

Chairs	Coffee Makers	Watches
 *M* = 4.77	 *M* = 5.37	 *M* = 5.37
 *M* = 4.37	 *M* = 5.92	 *M* = 4.05
 *M* = 4.37	 *M* = 5.00	 *M* = 5.54
 *M* = 5.38	 *M* = 5.54	 *M* = 5.38

Table 9 (continued)

Chairs	Coffee Makers	Watches
 *M* = 6.15	 *M* = 6.21	 *M* = 6.58
 *M* = 6.30	 *M* = 6.53	 *M* = 6.77
 M = 6.18	 M = 6.28	 M = 6.46
 *M* = 6.60	 *M* = 6.84	 *M* = 6.13

Table 10

t-Test Results of Selected Pretest 2 Stimuli

		Paired Sample *t*-tests					
Chairs							
	Stimuli	*N*	*M*	*SD*	*t*	*df*	*p*
Pair 1		43	1.69	.12	- 3.277	42	0.002
		43	1.47				
Pair 2		43	4.37	2.52	0.00	42	1.00
		43	4.37				
Pair 3		43	6.30	0.86	- 2.305	42	0.026
		43	6.60				

Table 10 (continued)

Coffee Makers							
	Stimuli	*N*	*M*	*SD*	*t*	*df*	*p*
Pair 1		43	2.20	1.81	- 2.35	42	0.023
		43	2.86				
Pair 2		43	5.00	2.58	- 0.94	42	0.350
		43	5.37				
Pair 3		43	6.84	0.96	2.05	42	0.046
		43	6.53				

Watches							
	Stimuli	*N*	*M*	*SD*	*t*	*df*	*p*
Pair 1		43	2.04	1.23	1.37	42	0.176
		43	1.81				
Pair 2		43	4.14	2.77	- 6.58	42	0.827
		43	4.05				
Pair 3		43	6.77	1.03	1.19	42	0.243
		43	6.58				

To test if the manipulation of product confidence was successful, an independent samples *t*-test was conducted. Results of the independent samples *t*-test indicated that perceived product confidence significantly differed between products with low versus high product review information, indicating a successful manipulation of product confidence (Table 11).

Table 11

Product Confidence Manipulation Check Pretest 2

				Independent Sample *t*-Test		
Product Confidence Level	*N*	*M*	*SD*	*t*	*df*	*p*
Low Product Confidence	24	4.63	0.77	3.136	41	0.003
High product Confidence	19	6.09	1.91			

Aesthetic Expertise

In order to ensure that two groups of participants varied on aesthetic expertise, the participants were recruited based on their indicated hobbies and interests in design and art. However, an independent samples *t*-test revealed that the two groups did not differ significantly in their expertise knowledge rating (Table 12). Next, a Chi-Square test was conducted to confirm whether participants' answer to the first aesthetic expertise question ("Do you have an interest, education, and/or occupation in the fields of arts and/ or design in general?") differed significantly. Chi- square results were also non-significant (X^2 (2) = 2.353, p= 0.308) (Table 13) indicating that the recruited high expertise group did not significantly differ from the low expertise group based on the measures used in Pretest 2. These results showed that the criteria used to differentiate aesthetic experts from non-experts during recruitment were either not

successful or that the measures used to assess aesthetic expertise in Pretest 2 were inadequate for differentiating the two groups. Hence, in the main study a two-step procedure was employed to select participants for the differing aesthetic expertise groups (low vs. high). First, participants were recruited according to hobbies and interests by the panel company. Second, at the beginning of the main study participants had to confirm their level of interest and knowledge in art and design. If there were discrepancies between the recruitment and participant expertise response, then participants were screened out. In addition to the above steps, at the end of the questionnaire, participants were asked to complete a design expertise task where they rated their familiarity with famous artists or concepts in art and design. Furthermore, participants completed centrality of visual product aesthetics (CVPA) measures to further allow differentiating their aesthetic expertise.

Table 12

Differences between Experts and Non-Experts Expertise Knowledge in Pretest 2

				Independent Sample *t*-test		
Aesthetic Expertise Level	*N*	*M*	*SD*	*t*	*df*	*p*
Low Expertise	17	4.18	1.15	0.056	41	0.956
High Expertise	26	4.19	0.71			

Table 13

Chi-Square Test Pretest 2

		Chi- Square Test		
		Recruited High Expertise Group	Recruited Low Expertise Group	Total
Do you have an interest, education, and/or occupation in the fields of arts and/ or design in general?	Yes	9	3	12
	No	16	14	30
	I do not know	1	0	1

CHAPTER IV. METHODOLOGY

This chapter provides an overview of the main study research design followed by descriptions of the main study. The main study empirically tested the hypotheses proposed in Chapter 2 using an online quasi-experiment and quantitative data analysis.

Research Design

The main study employed an Internet-based quasi-experimental research design with a 3 (design aesthetics: high, moderate, low; within-subjects factor) x 2 (product confidence: high vs. low; between-subjects factor) x 2 (aesthetic expertise: high vs. low; between-subjects factor) mixed factorial design to test the hypotheses proposed in this study. The independent variable (design aesthetics of the product) and the moderating variable (product confidence) were manipulated though appropriate stimuli developed through the pretests. The individual difference moderator (aesthetic expertise), the mediating variables (dimensions of perceived risks: psycho-social, functional, and financial risks), and the dependent variable (purchase intentions) were

measured using appropriate scales. The participants for the main study were recruited using a non-probabilistic convenience sample and it was ensured that each treatment group had an equivalent size.

Sample, Data Collection Procedure, and Stimuli

A non-probabilistic convenience sample of females between 21 to 41 years of age living in the U.S. was recruited from a panel of a national U.S. survey company named Cint that maintains an online insights exchange platform (www.cint.com/reach-survey-respondents). This was a relatively low-cost way to engage a diverse set of participants in a brief period. Females were selected as a sample for this study, because 74.9% of women are the primary shopper for their households ("Statistics On The Purchasing Power Of Women", 2017). The study needed a minimum sample size of 120 given that the research employed a 3 (design aesthetics: high, moderate, low; within-subjects factor) x 2 (product confidence: high vs. low; between-subjects factor) x 2 (aesthetic expertise: high vs. low; between-subjects factor) mixed factorial design and 30 participants are recommended for each between-subjects cell. The participation in the study was voluntary, and participants were paid a small monetary incentive by the survey company.

Identical to recruitment in pretest 2, Cint recruited the participants for the study according to their hobbies and interest in art and design, which was the first stage of participant selection. The goal was to achieve two groups with distinct levels of design and art interest and expertise. This procedure allowed to pre-assign participants to two diverse groups of expertise, and then be randomly assigned to the experimental manipulation for product confidence. As a second stage of participant selection, at the beginning of the questionnaire, participants were asked if they had any interest, education, and/or occupation in the fields of arts and/ or design in

general. This allowed ensuring that the participant selection by Cint according to hobbies and interests was correct. If there were discrepancies between Cint's selection and the participants' statement, the participants were screened out. For example, when participants in the pre-selected low aesthetic expertise group indicated to have an interest, education, or hobby in the field of art or design in general, they were screened out. When consistency was established between the participant's aesthetic expertise group based on Cint's selection and the participant's response on the aesthetic expertise questions, participants could proceed to the beginning of the main study's questionnaire.

The self-administered, Internet-based questionnaire (APPENDIX D) was designed using the Qualtrics survey tool, which is a web-based tool for creating and conducting online surveys and was accessible only to the selected panel list of Cint. After a brief introduction, participants were informed that the purpose of the study was to investigate consumers' product preferences. Participants were subsequently asked to indicate their consent to participate in the study. Next, participants saw six product pictures of high versus low design aesthetics accompanied by verbal descriptions of each. A screening task followed to ensure that the participants carefully reviewed the example pictures as well as the description of design. Participants had to successfully classify the design level of two of the previously shown pictures. If this task was successfully completed, participants could proceed to the main study's task, or else they were screened out. Next, participants were randomly assigned to one of two experimental conditions (high or low product confidence condition). Participants judged six chair stimuli (two stimuli for each aesthetic design level: low, moderate, or high) displayed either with or without product review information. After

the required sample size in each condition was achieved, the questionnaire link was deactivated and the promised incentives were delivered.

The questionnaire included pictures of the product in an online store setting (chosen in the study's pretests). Each photograph was presented on a separate page and the order of the products presented was randomized. Design aesthetics was a within-subjects factor, such that each participant saw and rated six product pictures two with low, moderate, and high design aesthetics (in randomized order). Product confidence was manipulated through product review information as discussed previously in context to the pretest. Product confidence was a between-subjects factor, such that participants saw all stimuli photographs with or without product review information. Participants completed multiple measures (discussed below) following each stimulus image.

Measurements

The questionnaire consisted of three sections. The stimulus photographs appeared prior to the measures of the first section that measured the dependent variables – purchase intentions and perceived risks. The second section included manipulation checks for design aesthetics and product confidence. The third section measured participant's aesthetic expertise and was followed by CVPA measures. The last section collected the demographic information of participants including measures for age, education, occupation, household income, ethnicity, and U.S. home region. All measurement items were adapted from existing scales published in peer-reviewed academic journals and are discussed in subsequent sections.

Dependent measures – Perceived risks and purchase intentions. Purchase intentions were measured using a three item 5-point Likert-type willingness to buy scale adapted from

Dodds, Monroe and Grewal (1991). An example of an item is “I would consider buying this (insert product).” Dodds et al. (1991) found the scale’s internal consistency to be high (Cronbach’s $\alpha = .97$), which was confirmed in our study (Table 14).

Perceived risks were measured by three dimensions: psycho-social, functional, and financial risks. Each dimension was measured by a three item 5-point Likert-type scale. The perceived psycho-social risk scale was adapted from Liljander et al.’s (2009) scale which previously had a Cronbach’s alpha of .89 and includes items such as “purchasing (this product) would be risky, because others would think less highly of me”. The functional risk scale was adapted from and Ha and Lennon (2006) and previously had a Cronbach’s alpha of .81 and includes items such as “the construction quality will be poor”. The financial risk scale was adapted from Stone and Gronhaug (1993) and previously had a Cronbach’s alpha of .76. The scale proposed by the Stone and Gronhaug (1993) included three items, which were adapted to match the current study’s purpose. For example, the first item was changed from “My purchasing a personal computer within the next 12 months for use at home would be a bad way to spend my money.” to “Purchasing this product would be a bad way to spend my money”. Another item was changed from “If I bought a personal computer for myself within the next 12 months of use at home, I would be concerned that the financial investment I would make would not be wise.” to “If I bought this product, I would be concerned that the financial investment I would make would not be wise”. The last item was changed from “If I bought a personal computer for myself within the next 12 months of use at home, I would be concerned that I really would not get my money's worth from this product.” to “If I bought this product, I would be concerned that I really would not get my money’s worth from this product”.

Manipulation checks. Design aesthetics was not operationalized by a single object property because previous researchers showed that multiple object properties covary with each other having an overarching gestalt effect on consumers' design perception, such that design is perceived in a holistic way (e.g. Hung & Chen, 2012). Thus, design aesthetics was measured by a 7-point semantic differential scale ranging from low design aesthetics (1) to moderate design aesthetics (4) and high design (7).

Product confidence was measured through three items tested in pretest 2. One example item was "Based on the product reviews, I am confident in my choice of this product." After shortening the scale, the internal consistency confirmed in pretest 2 was high (Cronbach's α coefficient= .97).

Aesthetic expertise was measured using the centrality of visual product aesthetics (CVPA) scale established by Bloch et al. (2003). Validation using the CVPA scale ensured that the participant selection and grouping into high versus low aesthetic expertise was successful. Previously, the 11-item scale was found to be one-dimensional with internal consistency of 0.89 (Bloch et al., 2003). Each item was accompanied by a 5-point Likert-type scale from strongly agree (=5) to strongly disagree (=1) (Table 14). An example item was "A product's design is a source of pleasure for me". In addition to the CVPA scale, we developed a five items aesthetic expertise scale to measure participants' aesthetic expertise. This measure followed Smith and Smith's (2006) approach to measuring aesthetic fluency and was adapted by Silvia and Berg (2011) to measure expertise in film. Participants were given a list of five names that represent prominent figures and terms in art history, including Salvador Dali, Andy Warhol, Impressionism, Sandro Botticelli, and Lorenzo Bernini. Next, they were asked to rate each item

on a 5-point scale (0 = I have never heard of this artist or term; 1 = I have heard of this artist or term but don't really know anything about it; 2 = I have a vague idea of what this is; 3 = I understand this artist or term when it is discussed; 4 = I can talk intelligently about this artist or term in art).

Table 14

Measurements for Main Study

Goal	Variable	Measures	Authors	α
Dependent Variables	Perceived Risks	<u>Functional risk</u> a) The construction quality will be poor. b) The product will not be durable. c) There will be something wrong with the product purchased.	Ha and Lennon (2006)	.81
		<u>Financial risk</u> a) Purchasing this product would be a bad way to spend my money. b) If I bought this product, I would be concerned that the financial investment I would make would not be wise. c) If I bought this product, I would be concerned that I really would not get my money's worth from this product.	Stone and Gronhaug (1993)	.76
		<u>Psycho-social risk</u> a) This product would not fit in with my self-image. b) Purchasing this product would be risky, because my friends, relatives or colleagues would not approve of it. c) Purchasing this product would be risky, because others would think less highly of me.	Liljander et al. (2009)	.89
	Purchase Intention	a) I would consider buying this product. b) I will purchase this product. c) There is a strong likelihood that I will buy this product.	Dodds et al. (1991)	.89

Table 14 (continued)

Goal	Variable	Measures	Authors	α
Manipulation Checks	Design Aesthetics	The design of this product is: Low (1) – moderate (4) – high (7)		
	CVPA	<u>Value</u> a) Owning products that have superior designs makes me feel good about myself b) I enjoy seeing displays of products that have superior designs c) A product's design is a source of pleasure for me d) Beautiful product designs make our world a better place to live <u>Acumen</u> e) Being able to see subtle differences in product designs is one skill that I have developed over time f) I see things in a product's design that other people tend to pass over g) I have the ability to imagine how a product will fit in with designs of other things I already own h) I have a pretty good idea of what makes one product look better than its competitors <u>Response</u> i) Sometimes the way a product looks seems to reach out and grab me j) If a product's design really "speaks" to me, I feel that I must buy it k) When I see a product that has a really great design, I feel a strong urge to buy it	Bloch et al. (2003)	.89

Table 14 (continued)

Goal	Variable	Measures	Authors	α
Manipulation Checks	Design Interest, Education, or Occupation	Do you have any interest, education, and/or occupation in the fields of arts and/ or design in general? a) Yes, I have interest, education, and/or occupation in the fields of arts and/ or design in general. b) No, I have no interest, education, and/or occupation in the fields of arts and/ or design in general. c) I do not know.		
	Aesthetic Expertise	Please indicate your familiarity with the figures and terms: a) Salvador Dali b) Andy Warhol c) Impressionism d) Sandro Botticelli e) Lorenzo Bernini	Silvia and Berg (2011)	
	Product Confidence	a) Based on the product reviews, I am confident in my choice of this product b) Based on the product reviews, I am confident that this product is what I am looking for c) Based on the product reviews, I am confident that there is nothing wrong with this product		

Data Analysis

Data were analyzed using IBM SPSS statistics 24 software. The steps for the preliminary analysis included coding the different experimental conditions (the two product confidence conditions, participants' aesthetic expertise, and the three design aesthetics condition), cleaning

the data, conducting the sample's descriptive analysis, conducting several procedures to ensure that the measure is psychometrically good, calculating the means, and creating composite scores for each measure. The main study conducted different analyses to test the proposed hypotheses (Table 15). Two repeated measures ANCOVAs were performed to test the proposed hypotheses with mean scores of perceived risks and purchase intentions for the three design aesthetics levels as the repeated measures factor (one separate ANCOVA was run for each dependent variable). Product confidence and aesthetic expertise were treated as between-subjects factors and age was employed as a continuous covariate, in order to control for its effects. The repeated measures ANCOVA were then followed up by post-hoc tests. For hypothesis 4, simple linear regressions were performed to test the influence of perceived risks on purchase intentions. Hayes model 4 (2013) was used to test hypothesis 5.

Table 15

Hypothesis Testing

Hypothesis	Variable	Type of Variable	Statistical Tests
1a, 1b, 7, 9a, 9b, 11a, 11b, 13,15a, 15b, 17	Design Aesthetics (IV) Product Confidence (IV) Aesthetic Expertise (IV) Age (Covariate) Purchase Intention (DV)	Categorical Categorical Categorical Continuous Continuous	Repeated Measures Analysis of Covariance
2a, 2b, 2c, 3a, 3b, 3c, 6a, 6b, 6c, 8a, 8b, 8c (1- 2), 10, 12, 14a, 14b, 14c (1-2), 16a, 16b, 16c (1-2)	Design Aesthetics (IV) Aesthetic Expertise (IV) Product Confidence (IV) Age (Covariate) Perceived Psycho-Social Risk (DV) Perceived Functional Risk (DV) Perceived Financial Risk (DV)	Categorical Categorical Categorical Continuous Continuous Continuous Continuous	Repeated Measures Analysis of Covariance
4a, 4b, 4c	Perceived Risks (IV) Purchase Intention (DV)	Continuous Continuous	Simple Linear Regression
5	Design Aesthetics (IV) Perceived Risks (IV & DV) Purchase Intention (DV)	Categorical Continuous Continuous	Multiple Linear Regressions

CHAPTER V. RESULTS

The objective of this study was to test the effect of design aesthetics, aesthetic expertise, and product confidence on perceived risks and purchase intentions. Data were collected in two pretests followed by the main study (Internet-based quasi-experiment). All data were analyzed using SPSS software and the PROCESS macro in the SPSS software. The steps for the preliminary analysis included coding design aesthetics, product confidence, and aesthetic expertise conditions, cleaning the data, conducting the sample's descriptive analysis, conducting factor analysis, checking the reliability of all variable measures, calculating the means, and creating composite scores for each measure. Following the preliminary data analysis process, hypotheses testing analysis was conducted.

Preliminary Analyses

Sample Description

The demographic characteristics of the sample in the main study were analyzed using descriptive statistics, specifically frequencies in the SPSS software (Table 16). The sample consisted of 120 females. In terms of ethnicity, 66.7% of the participants were Non-Hispanic White (Caucasian American), 13.3% Non- Hispanic Black (African American), 11.7% Hispanic, 6.7% Asian/ Pacific Islander, and 1.6% were American Indian/ Alaskan Native and other. Participants' age ranged from 21 to 41 years with 56.7% of participants aged between 30 – 41 years and 41.7% of participants were between 20 – 29 years of age. The survey company also provided the birth dates of each participant (Table 16), such that the variable 'age' could be treated as a continuous variable (covariate) in the analysis. The participants' income ranged from below $15,000 to over $100,000 with 20.0% of participants earning above $100,000, 18.3% earning $50,000 - $74,999, 17.5% earning $35,000 – $49,999, 15% earning between $75,000 and $90,000, and 10.8% earning $15,000 - $24,999. In terms of education, 41.7% of participants had a Bachelor's degree, 20% a Master's degree, 21.7% some college degree, 7.5% an associate degree, and 6.7% a doctoral degree. The other 2.5% earned no high school diploma or a high school diploma. The sample consisted mainly of professionals 52.2%, followed by 14.2% homemaker, 14.2% student, 11.7% skilled labor, 5% retired, and 2.5% were service workers. The sample's residence region in the U.S. was distributed between the west (22.5%), south (36.7%), midwest (17.5%), and northeast (23.3%).

Table 16

Sample Characteristics of Main Study

		n	%
Occupancy	(N=120)		
	Professional	63	52.5%
	Homemaker	17	14.2%
	Student	17	14.2%
	Skilled Labor	14	11.7%
	Retired	6	5.0%
	Service Worker	3	2.5%
	Other	0	0.0%
Residence in USA (N=120)			
	South	44	36.7%
	Northeast	28	23.3%
	West	27	22.5%
	Midwest	21	17.5%
Household Income (N=120)			
		< $15,000	7
	$15,000 - $24,999	13	5.8%
	$25,000 - $34,999	9	10.8%
	$35,000 -$49,999	21	7.5%
	$50,000 - $74,999	22	17.5%
	$75,000 - $99,999	18	18.3%
	$100,000 +	24	15.0%
	Would rather not say	6	20.0%
Education	(N=120)		
	Bachelor's Degree	50	41.7%
	Some College	26	21.7%
	Master's Degree	24	20.0%
	Associate Degree	9	7.5%
	Doctorate Degree	8	6.7%
	No High School Diploma	2	1.7%
	High School Diploma	1	0.8%
	Other	0	0.0%

Table 16 (continued)

		n	%
Age	(N=120)		
	21	6	5.0%
	22	2	1.7%
	23	4	3.3%
	24	4	3.3%
	25	1	0.8%
	26	7	5.8%
	27	5	4.2%
	28	7	5.8%
	29	11	9.2%
	30	5	4.2%
	31	6	5.0%
	32	4	3.3%
	33	11	9.2%
	34	5	4.2%
	35	6	5.0%
	36	9	7.5%
	37	7	5.8%
	38	6	5.0%
	39	6	5.0%
	40	6	5.0%
	41	2	1.7%
Ethnicity	(N=120)		
	Non- Hispanic White (Caucasian American)	80	66.7%
	Non-Hispanic Black (African American)	16	13.3%
	Hispanic	14	11.7%
	Asian/ Pacific Islander	8	6.7%
	American Indian/ Alaskan Native	1	0.8%
	Other	1	0.8%

Scale Dimensionality

A construct can be hypothesized to be one or multidimensional. Therefore, the scale selected to operationalize the constructs should reflect the hypothesized dimensionality (Bearden, Netemeyer, & Haws, 2010). After reliability checks, the perceived risks scale's multidimensionality was checked by SPSS Exploratory Factor Analysis (EFA) (eigenvalue > 1), specifically Principal Components Analysis (PCA) with Varimax Rotation allowing items to load freely without constraints. Results from the PCA revealed that all proposed one-dimensional scales (purchase intentions and product confidence) loaded on one factor only. Further, results from PCA confirmed that perceived risks is a multidimensional variable. However, based on each item's factor loadings, three proposed perceived risks dimensions were not supported. Results indicated, that the items loading differed for each stimulus (Table 17). It appeared that the loading depended on the stimulus design aesthetic level, such that factors loaded differently for low versus moderate versus high design aesthetics. No items were removed and all items were kept since loadings were above .5. Due to the inconsistent loading on numerous factors, the conceptually identified factors based on the perceived risk scale studies (Ha & Lennon, 2006; Liljander et al., 2009; Stone & Gronhaug, 1993) were retained and further analyses were continued based on previously defined three perceived risks dimensions. However, a point to note is that using the previously defined factors led to multicollinearity complications, which needed to be controlled for, in the following analyses, which will be described in each section.

Table 17

Factor Loadings for Multidimensionality of Perceived Risks Scales

		Factor Loadings		
Stimuli	Perceived Risk Scale Item	1	2	3
	The construction quality will be poor.	**0.844**	0.176	
	The product will not be durable.	**0.865**	0.107	
	There will be something wrong with the product purchased.	**0.784**	0.206	
	Purchasing this product would be a bad way to spend my money.	**0.632**	0.555	
	If I bought this product, I would be concerned that the financial investment I would make would not be wise.	**0.688**	0.540	
	If I bought this product, I would be concerned that I really would not get my money's worth from this product.	**0.639**	0.571	
	This product would not fit in with my self-image	0.387	**0.746**	
	Purchasing this product would be risky, because my friends, relatives or colleagues would not approve of it.	0.187	**0.905**	
	Purchasing this product would be risky, because others would think less highly of me.	0.092	**0.897**	
	The construction quality will be poor.	**0.827**	0.272	
	The product will not be durable.	**0.86**	0.075	
	There will be something wrong with the product purchased.	**0.863**	0.135	
	Purchasing this product would be a bad way to spend my money.	**0.732**	0.460	
	If I bought this product, I would be concerned that the financial investment I would make would not be wise.	**0.678**	0.552	
	If I bought this product, I would be concerned that I really would not get my money's worth from this product.	**0.693**	0.544	
	This product would not fit in with my self-image	0.358	**0.701**	
	Purchasing this product would be risky, because my friends, relatives or colleagues would not approve of it.	0.158	**0.911**	
	Purchasing this product would be risky, because others would think less highly of me.	0.143	**0.911**	
	The construction quality will be poor.	**0.887**		0.044
	The product will not be durable	**0.821**		0.039
	There will be something wrong with the product purchased.	**0.681**		0.206
	Purchasing this product would be a bad way to spend my money.	**0.855**		0.205
	If I bought this product, I would be concerned that the financial investment I would make would not be wise.	**0.848**		0.224
	If I bought this product, I would be concerned that I really would not get my money's worth from this product.	**0.85**		0.208
	This product would not fit in with my self-image	**0.675**		0.395
	Purchasing this product would be risky, because my friends, relatives or colleagues would not approve of it.	0.171		**0.943**
	Purchasing this product would be risky, because others would think less highly of me.	0.157		**0.924**

Table 17 (continued)

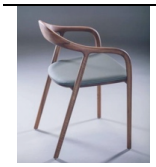
Stimuli	Perceived Risk Scale Item	Factor Loadings 1	2	3
	The construction quality will be poor.	0.174	**0.869**	0.222
	The product will not be durable.	0.085	**0.85**	0.195
	There will be something wrong with the product purchased.	0.179	**0.883**	0.102
	Purchasing this product would be a bad way to spend my money.	**0.909**	0.135	0.179
	If I bought this product, I would be concerned that the financial investment I would make would not be wise.	**0.922**	0.154	0.157
	If I bought this product, I would be concerned that I really would not get my money's worth from this product.	**0.927**	0.145	0.059
	This product would not fit in with my self-image	**0.601**	0.130	0.416
	Purchasing this product would be risky, because my friends, relatives or colleagues would not approve of it.	0.215	0.242	**0.884**
	Purchasing this product would be risky, because others would think less highly of me.	0.159	0.192	**0.89**
	The construction quality will be poor.	0.178	**0.894**	0.261
	The product will not be durable.	0.267	**0.872**	0.113
	There will be something wrong with the product purchased.	0.251	**0.873**	0.222
	Purchasing this product would be a bad way to spend my money.	**0.891**	0.223	0.209
	If I bought this product, I would be concerned that the financial investment I would make would not be wise.	**0.894**	0.283	0.081
	If I bought this product, I would be concerned that I really would not get my money's worth from this product.	**0.878**	0.308	0.157
	This product would not fit in with my self-image	**0.742**	0.061	0.485
	Purchasing this product would be risky, because my friends, relatives or colleagues would not approve of it.	0.212	0.284	**0.886**
	Purchasing this product would be risky, because others would think less highly of me.	0.205	0.201	**0.913**
	The construction quality will be poor.	0.184	**0.902**	0.174
	The product will not be durable.	0.327	**0.842**	0.099
	There will be something wrong with the product purchased.	0.307	**0.786**	0.348
	Purchasing this product would be a bad way to spend my money.	**0.873**	0.268	0.170
	If I bought this product, I would be concerned that the financial investment I would make would not be wise.	**0.87**	0.291	0.241
	If I bought this product, I would be concerned that I really would not get my money's worth from this product.	**0.812**	0.270	0.301
	This product would not fit in with my self-image	**0.832**	0.186	0.190
	Purchasing this product would be risky, because my friends, relatives or colleagues would not approve of it.	0.274	0.187	**0.912**
	Purchasing this product would be risky, because others would think less highly of me.	0.255	0.236	**0.899**

Reliability Analyses

Reliability analysis was performed for all scale items in each composite variable. Scale reliability refers to the scale's internal consistency and stability in scores originating from the repeated administration of a scale (Cronbach, 1970; Saunders, Lewis, & Thornhill, 2012; Touliatos & Compton, 1988). The reliability of an instrument can be estimated by the internal consistency technique using Cronbach's test of inter-item consistency, which was applied in this study. A Cronbach's alpha value of .70 or higher is considered to indicate adequate reliability (Nunnally & Bernstein, 1994). Further, in this study's scale items from previous credited studied were adopted and adapted, which can also allow reliability assessment. However, based on Cronbach's alpha value of .70 or higher, all measures had adequate reliability (Table 18).

Table 18

Main Study Scale Reliabilities

Stimuli	Measures	Cronbach' s Alpha	N of Items	*N*
	Purchase Intentions	0.959	3	120
	Perceived Psycho- Social Risks	0.883	3	120
	Perceived Financial Risks	0.932	3	120
	Perceived Functional Risks	0.869	3	120
	Product Confidence	0.861	3	120
	Purchase Intentions	0.979	3	120
	Perceived Psycho- Social Risks	0.857	3	120
	Perceived Financial Risks	0.930	3	120
	Perceived Functional Risks	0.880	3	120
	Product Confidence	0.889	3	120
	Purchase Intentions	0.971	3	120
	Perceived Psycho- Social Risks	0.751	3	120
	Perceived Financial Risks	0.935	3	120
	Perceived Functional Risks	0.875	3	120
	Product Confidence	0.842	3	120
	Purchase Intentions	0.970	3	120
	Perceived Psycho- Social Risks	0.738	3	120
	Perceived Financial Risks	0.944	3	120
	Perceived Functional Risks	0.873	3	120
	Product Confidence	0.846	3	120
	Purchase Intentions	0.977	3	120
	Perceived Psycho- Social Risks	0.825	3	120
	Perceived Financial Risks	0.944	3	120
	Perceived Functional Risks	0.923	3	120
	Product Confidence	0.875	3	120
	Purchase Intentions	0.982	3	120
	Perceived Psycho- Social Risks	0.785	3	120
	Perceived Financial Risks	0.937	3	120
	Perceived Functional Risks	0.895	3	120
	Product Confidence	0.863	3	120

Creation of Composite Variables

Composite scores were calculated for the following scales: purchase intentions for each design level and all design levels combined, perceived risks (psycho-social, functional, financial) for each design level and all combined, three levels of design aesthetics, and product confidence. Composite scores were created by averaging the item scores from each of the above variables for each respondent.

Aesthetic Expertise Groups

As discussed previously, to ensure appropriate participant selection for the two aesthetic expertise groups, the study employed a two-step procedure. First, participants were recruited according to hobbies and interests by the panel company. Second, at the beginning of the main study, participants had to confirm their level of interest and knowledge in art and design. If there were discrepancies, participants were screened out. In addition to the above steps, at the end of the questionnaire, participants were asked to complete a design expertise task where they rated their familiarity with famous artists or concepts in art and design. An independent samples *t*-test confirmed significant differences between low versus high aesthetic expertise in the expertise task ratings (M_{high}= 3.21, M_{low} = 2.61, p = .001). Participants with high aesthetic expertise had higher ratings in the expertise task than participants with low aesthetic expertise (Table 19).

Table 19

Aesthetic Expertise Group Differences Main Study

					Independent Sample *t*-test		
	Between Condition	*N*	*M*	*SD*	*t*	*df*	*p*
Expertise Task Ratings (1 = low, 4 = high)	Low Aesthetic Expertise	59	2.61	0.89	3.9	118	0.001
	High Aesthetic Expertise	61	3.21	1.02			

Additionally, participants completed CVPA measures at the end of the questionnaire allowing an additional confirmation that the selection of participants with high aesthetic expertise and low aesthetic expertise was successful. Results revealed significant differences in CVPA value and acumen measures (CVPA dimension 1 and 2) for participants with high versus low aesthetic expertise. For both CVPA dimensions, high aesthetic experts achieved higher ratings on CVPA value (M_{high}= 5.46, M_{low} = 4.83, p = .007) and CVPA acumen (M_{high}= 5.51, M_{low} = 4.33, p < .001) measures. Even though differences were not significant for high versus low aesthetic expertise (M_{high}= 5.42, M_{low} = 5.16, p = 0.234) for the CVPA response measure, participants with high aesthetic expertise achieved higher ratings. Significant differences in the first two CVPA dimensions between high versus low aesthetic expertise further supported the successful participant selection in high versus low design expertise groups.

Table 20

t-Test Results for CVPA Measures and Aesthetic Expertise

		Independent Sample *t*-tests					
CVPA Dimension	Between Condition	*N*	*M*	*SD*	*t*	*df*	*p*
Value	Low Aesthetic Expertise	59	4.83	130	2.75	118	0.007
	High Aesthetic Expertise	61	5.46	1.21			
Acumen	Low Aesthetic Expertise	59	4.33	1.12	6.24	118	0.00
	High Aesthetic Expertise	61	5.51	0.92			
Response	Low Aesthetic Expertise	59	5.16	1.34	1.19	118	0.234
	High Aesthetic Expertise	61	5.42	0.99			

Manipulation Checks

Manipulation checks were conducted for the manipulated variables of design aesthetics and product confidence.

Design aesthetics. Conducting paired samples *t*-tests determined if the differences between the three levels of designs of each product set were statistically significant from each other. The rating for design aesthetics (low, moderate, and high design aesthetics) in each level did differ significantly for chairs with low (M_{low1}= 2.13, M_{low2} = 2.75, p< .001) and high (M_{high1}= 5.30, M_{high2} = 5.72, p= .004) design aesthetics, but did not differ for chairs with moderate design aesthetics (M_{mod1}= 4.86, M_{mod2} = 4.81, p= .767) (Table 21). Next, scores in each design level were averaged and paired samples *t*- tests were conducted to reveal if the design aesthetic ratings for each level (low, moderate, and high) differed significantly from each other (Table 22 and Table 23). The chairs with high design aesthetics were rated significantly higher

(M_{high1}= 5.30, M_{high2} = 5.72) than the chairs with moderate design aesthetics (M_{mod1}= 4.86, M_{mod2} = 4.81, $p < .001$) (Table 23). Chairs with moderated design aesthetics (M_{mod1}= 4.86, M_{mod2} = 4.81) were rated significantly higher than chairs with low design aesthetics (M_{low1}= 2.13, M_{low2} = 2.75, $p < .001$) (Table 22). Thus, it can be concluded that the manipulation of the three levels of design aesthetics was successful.

Table 21

t-Test Results for the Three Levels of Design Aesthetics

		Paired Sample *t*-tests					
	Stimuli	*N*	*M*	*SD*	*t*	*df*	*p*
Pair 1		120	2.13	1.412	- 4.741	119	0.000
		120	2.75	1.626			
Pair 2		120	4.86	1.434	0.3	119	0.767
		120	4.81	1.573			
Pair 3		120	5.30	1.737	- 2.918	119	0.004
		120	5.72	1.646			

Table 22

t-Test Results for Low and Moderate Levels of Design Aesthetics

		Paired Sample *t*-tests					
	Stimuli	*N*	*M*	*SD*	*t*	*df*	*p*
Pair 1		120	2.13	1.412			
		120	2.75	1.626			
					- 15.632	119	0.000
Pair 2		120	4.86	1.434			
		120	4.81	1.573			

Table 23

t-Test Results for Moderate and High Levels of Design Aesthetics

		Paired Sample *t*-tests					
	Stimuli	*N*	*M*	*SD*	*t*	*df*	*p*
Pair 2		120	4.86	1.434			
		120	4.81	1.573			
					- 14.832	119	0.000
Pair 3		120	5.30	1.737			
		120	5.72	1.646			

Product confidence. It was expected that an independent samples *t*-test would indicate significant differences between the two levels of product confidence, such that the high product confidence manipulation would lead to higher product confidence ratings and vice versa. However, an independent sample *t*-test did not reveal significant difference between high versus low product confidence manipulations (M_{high}= 4.11, M_{low} = 4.31, p = .226) (Table 24).

Table 24

Product Confidence Group Differences Main Study

				Independent Sample *t*-test		
Product Confidence Level	*N*	*M*	*SD*	*t*	*df*	*p*
Low Product Confidence	59	4.11	0.78	1.12	118	0.226
High Product Confidence	61	4.31	0.95			

The next step was to test if product confidence differed based on the participant's expertise level or the product's design aesthetics level. To test this, two independent samples *t*-tests were conducted. The first *t*-test explored if the product confidence manipulation was differentially effective based on the level of design aesthetics such that it was successful for one design aesthetics level, but not in all design aesthetics levels. Results revealed no significant differences in product confidence ratings (means) between the high and low confidence groups for low (M_{high}= 3.82, M_{low} = 4.03, p = .38) and moderate design aesthetics (M_{high}= 4.79, M_{low} = 4.55, p = .21). However, significant differences in product confidence ratings (means) between the high and low confidence groups for high design aesthetics were found (M_{high}= 5.72, M_{low} = 3.75, p = .04). For high design aesthetics, product confidence is influenced by the availability of

consumer star ratings and thus, is important for high design aesthetic products. For low and moderate design aesthetics, product confidence is not significantly influenced by consumer star ratings.

Table 25

t-Test Results for the Three Levels of Design Aesthetics and Product Confidence Groups

		Paired Sample *t*-tests					
	Stimuli	*N*	*M*	*SD*	*t*	*df*	*p*
Low Design Aesthetics	Low confidence	59	4.03	1.23	1.26	118	0.38
	High confidence	61	3.82	1.39			
Moderate Design Aesthetics	Low confidence	59	4.55	1.03	-0.881	118	0.21
	High confidence	61	4.79	1.07			
High Design Aesthetics	Low confidence	59	3.75	1.34	2.05	118	0.04
	High confidence	61	5.72	1.59			

Similarly, the second *t*-test was conducted to explore if the product confidence manipulation was dependent on participants' aesthetic expertise level such that the product manipulation was successful in one expertise group, even if not successful in both groups. Results revealed significant differences in product confidence for low versus high aesthetic expertise (M_{high}= 4.12, M_{low} = 3.99, p = .008) (Table 26). Participants with high aesthetic expertise showed higher product confidence than participants with low aesthetic expertise.

Table 26

t-Test Results for High vs. Low Aesthetic Expertise Groups and Product Confidence Ratings

		Paired Samples *t*-tests					
	Between Condition	*N*	*M*	*SD*	*t*	*df*	*p*
Product Confidence Ratings	Low Aesthetic Expertise	59	3.99	0.88	2.7	118	0.008
	High Aesthetic Expertise	61	4.12	0.82			

The next step explored if participants with low versus high aesthetic expertise were affected differently by product ratings in the low versus high product confidence manipulation. The data of the main study was thus split in the two groups according to the participant's aesthetic expertise level. For high aesthetic expertise, no significant differences in product confidence ratings (means) between the high and low confidence manipulations were found (M_{high}= 4.39, M_{low} = 4.43, p = .855). Thus, for high design expertise, product confidence was not influenced by consumer star ratings (Tale 27). However, for low design expertise, marginally significant differences in product confidence ratings (means) between the high and low confidence manipulations were found (M_{high}= 4.21, M_{low} = 3.77, p = .057) (Table 28). Thus, for consumers with low aesthetic expertise, their product confidence was influenced by consumer star ratings, such that high consumer star ratings significantly increased their product confidence.

Table 27

t-Test Results for High Aesthetic Expertise and High vs. Low Product Confidence Manipulations

		Paired Samples *t*-tests					
	Between Condition	*N*	*M*	*SD*	*t*	*df*	*p*
Product Confidence Ratings	Low Product Confidence	30	4.43	0.67	-0.18	59	0.855
	High Product Confidence	31	4.39	0.96			

Table 28

t-Test Results for Low Aesthetic Expertise and High vs. Low Product Confidence Manipulations

		Paired Samples *t*-tests					
	Between Condition	*N*	*M*	*SD*	*t*	*df*	*p*
Product Confidence Ratings	Low Product Confidence	29	3.77	0.75	1.947	57	0.057
	High Product Confidence	30	4.21	0.95			

In conclusion, even though the first *t*-test did not reveal significant differences between the low and high product confidence manipulation groups, the analyses that followed provided evidence that the product confidence manipulation was indeed successful; although it differed between the participants' aesthetic expertise level as well as the product's design aesthetic level. Specifically, the product confidence manipulation was significant in the low aesthetic expertise group and for high design aesthetic products. This makes sense since low aesthetic expertise consumers may be more reliant on consumer star ratings than high aesthetic expertise consumers, given their lack of expertise in judging the aesthetics of products. Similarly, consumers may rely on consumer star rating for products that are high in aesthetic design since they may be less

certain in their judgments with respect to these products.

Testing for Age-Differences

Before conducting the hypotheses testing analyses, the interaction effect of age and design aesthetics on purchase intentions and perceived risks was tested to explore if age needs to be controlled for in the main study. Mauchly's Test of Sphericity revealed that assumptions of sphericity were violated. An ANCOVA using a Huynh-Feldt correction (for violation of sphericity) with purchase intention as a dependent measure and design aesthetics (with three levels) and age (continuous covariate) as independent variables revealed a significant interaction effect for the two IVs on purchase intentions ($F(1.696,196.06) = 6.91$, $p = 0.05$). A second ANCOVA using a Huynh-Feldt correction (for violation of sphericity) with the three dimensions of perceived risks as a dependent variables and design aesthetics (with three levels) and age (continuous covariate) as independent variables revealed a significant interaction effect for the two IVs on two dimensions of perceived risks (psycho-social: $F(1.725,198.361) = 3.606$, $p = 0.035$; functional: $F(1.856,213.48) = 4.16$, $p = 0.019$) and a marginal significant effect on the third dimension (financial: $F(1.873,215.378) = 2.59$, $p = 0.085$). Hence, it was concluded that age needed to be controlled for in the study and, therefore, was used as a covariate in all analyses of the main study.

Hypothesis Testing Data Analyses and Results

In this section, the data analyses and results relating to the testing of the 17 hypotheses proposed in Chapter 2 are reported. The independent variable, design aesthetics and the

moderator, product confidence was manipulated. The moderator, aesthetic expertise was measured. However, the variable was not used as a measured variable in the hypotheses testing. Rather, special selection criteria in the form of a two-step recruitment procedure were employed to recruit subjects systematically differing in aesthetic expertise. The dependent variables measured in this study were perceived risks (psycho-social, financial, and functional risks) and purchase intentions. Two repeated measures ANCOVAs were performed to test the proposed hypotheses with mean scores of perceived risks and purchase intentions for the three design aesthetics levels as the repeated measures factor (one separate ANCOVA was run for each dependent variable). Product confidence and aesthetic expertise were treated as between-subjects factors and age was employed as a continuous covariate, to control for its effects. The repeated measures ANCOVA were then followed by post-hoc tests. For hypothesis 4, simple linear regressions were performed to test the influence of perceived risks on purchase intentions. Hayes model 4 (2013) was used to test hypothesis 5.

In the following sections, the hypotheses will be first presented in a numerical order starting with the first five hypotheses predicting main effects. Then, the next 12 hypotheses representing interaction effects will be presented according to the dependent variables of perceived risks and purchase intentions, and hence may not be in numerical order.

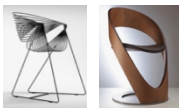
Effect of Design Aesthetics on Purchase Intentions

Hypothesis 1. Hypothesis 1 proposed a direct effect of design aesthetics on purchase intentions, such that purchase intentions will be higher for moderate design aesthetics as compared to a) low or b) high design aesthetics. Mauchly's Test of Sphericity revealed that assumptions of sphericity were violated. ANCOVA with repeated measures using a Huynh-Feldt

correction (for violation of sphericity) revealed that the mean scores for purchase intentions for the differing design aesthetics level were significantly different ($F(1.696,196.06) = 5.77$, $p = 0.006$) with a medium effect size of partial $\eta^2 = 0.48$. A post-hoc test using the Bonferroni correction revealed that purchase intentions for moderate design aesthetic products were significantly higher than low design aesthetic products ($M_{low} = 3.54$, $M_{mod} = 4.40$ $p < 0.001$) and high design aesthetic products ($M_{mod} = 4.40$, $M_{high} = 3.48$, $p < 0.001$). However, no significant differences were found for purchase intentions between low and high design aesthetic products ($M_{low} = 3.54$, $M_{high} = 3.48$ $p = 1.00$) were found. Therefore, it can be concluded that purchase intentions for moderate design aesthetics are higher as compared to low and high design aesthetics supporting hypothesis 1a and 1b.

Table 29

Post-Hoc Test Results for the Three Levels of Design Aesthetics on Purchase Intention

	Level of Design Aesthetics	Stimuli	*N*	*M*	*SE*	*p*
Pair 1	Low		120	3.54	0.1333	0.000
	Moderate		120	4.40	0.114	
Pair 2	Moderate		120	4.40	0.114	0.000
	High		120	3.48	1.573	

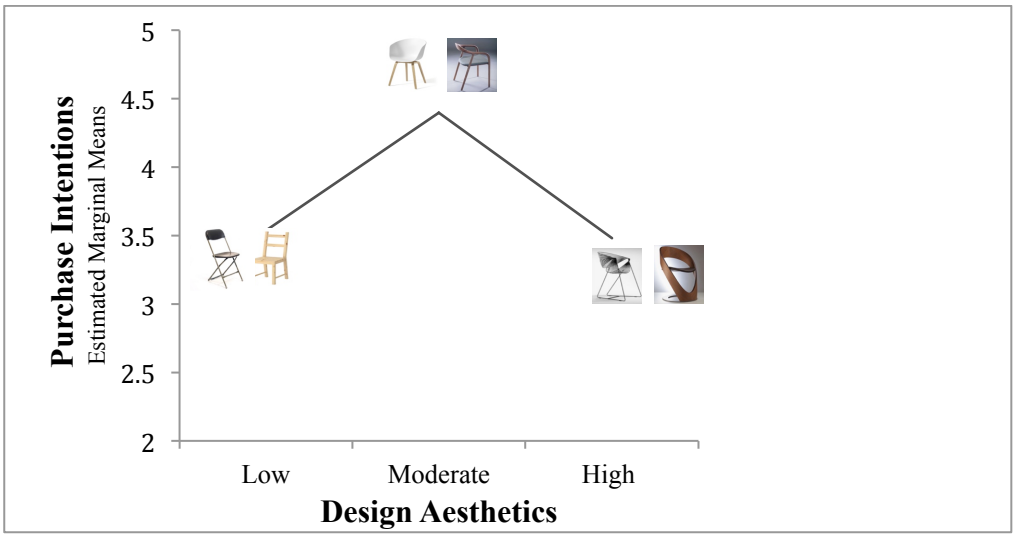


Figure 4. Direct effect of design aesthetics on purchase intentions.

Effect of Design Aesthetics on Perceived Risks

Hypothesis 2 and 3. Hypothesis 2 proposed a direct effect of design aesthetics on consumers' risk perceptions, such that there will be lower a) psycho-social risk perceptions, b) functional risk perceptions, and c) financial risk perceptions associated with a product having moderate than high design aesthetics. Hypothesis 3 proposed a direct effect of design aesthetics on consumers' risk perceptions, such that there will be lower a) psycho-social risk perceptions, b) functional risk perceptions, and c) financial risk perceptions associated with a product having moderate than low design aesthetics. Mauchly's Test of Sphericity revealed that assumptions of sphericity were violated for the ANCOVA with repeated measures for the effect of design aesthetics on psycho-social risk: $\chi 2(2) = 27.604$, $p < 0.001$; financial risk: $\chi 2(2) = 14.741$, $p =$

0.001; and functional risk: $\chi 2(2) = 16.011$, $p < 0.001$. Thus, ANCOVA with repeated measures with a Huynh-Feldt correction (for violation of sphericity) was used.

Results revealed that psycho-social risks for the three design aesthetics levels were significantly different from each other ($F(1.725, 198.36) = 4.76$, $p = 0.013$) with a small effect size of partial $\eta^2 = 0.040$. A post-hoc test using the Bonferroni correction revealed that perceived psycho-social risks for moderate design aesthetic products were significantly lower than for low design aesthetic products ($M_{low} = 3.61$, $M_{mod} = 2.92$, $p < 0.001$) and high design aesthetic products ($M_{mod} = 2.92$, $M_{high} = 3.44$, $p < 0.001$). However, no significant differences were found for perceived psycho-social risks between low and high design aesthetic products ($M_{low} = 3.61$, $M_{high} = 3.44$, $p = 0.81$). Therefore, it can be concluded that perceived social risks for moderate design aesthetics are lower as compared to low and high design aesthetics supporting hypothesis 2a and 3a.

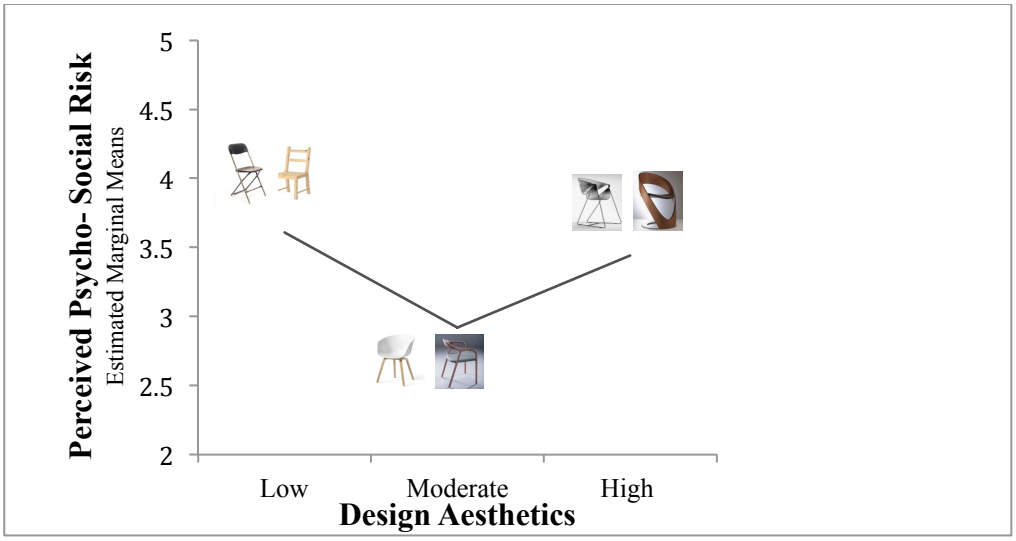


Figure 5. Direct effect of design aesthetics on perceived psycho-social risk.

The repeated measures ANCOVA showed that perceived functional risks for the three design aesthetics levels did significantly differ from each other ($F(1.856, 213.48) = 3.95$, $p = 0.023$) with a small effect size of partial $\eta^2 = 0.033$. A post-hoc test using the Bonferroni correction revealed that perceived functional risks for moderate design aesthetic products were significantly lower than for low design aesthetic products ($M_{low} = 3.58$, $M_{mod} = 2.83$, $p < 0.001$) and high design aesthetic products ($M_{mod} = 2.83$, $M_{high} = 3.11$, $p = 0.042$). Also, significant differences were found for perceived functional risks between low and high design aesthetics ($M_{low} = 3.58$, $M_{high} = 3.11$, $p = 0.006$). Low design aesthetics led to highest functional risk perceptions. It can be concluded that perceived functional risks for moderate design aesthetics are lower as compared to low and high design aesthetics supporting hypothesis 2b and 3b.

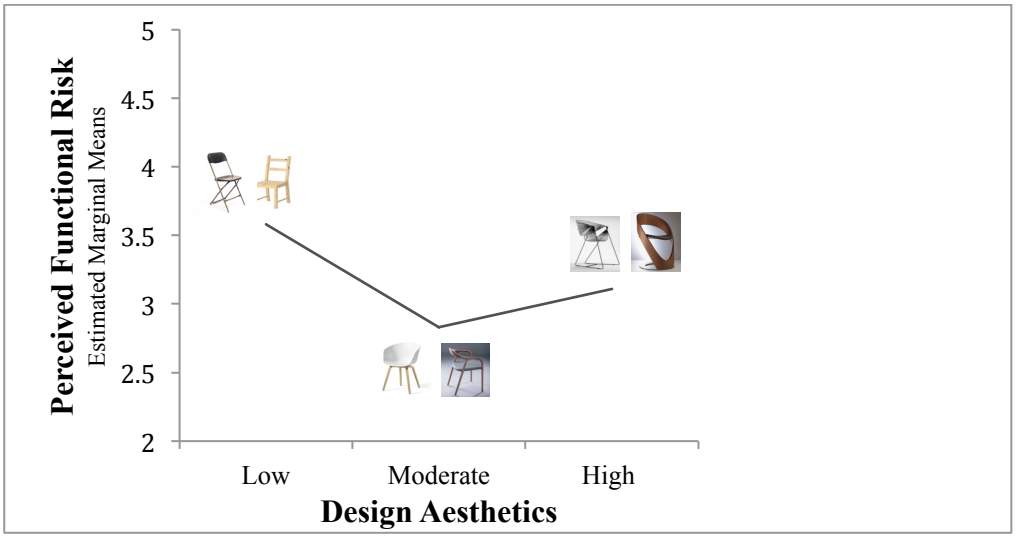


Figure 6. Direct effect of design aesthetics on perceived functional risk.

Further, results revealed that perceived financial risks for the three design aesthetics levels did significantly differ from each other ($F(1.873, 215.38) = 4.84$, $p = 0.010$) with a small

effect size of partial $\eta^2 = 0.040$. A post-hoc test using the Bonferroni correction revealed that perceived financial risks for moderate design aesthetic products were significantly lower than for low design aesthetic products ($M_{low} = 3.84$, $M_{mod} = 3.34$, $p = 0.002$) and high design aesthetic products ($M_{mod} = 3.34$, $M_{high} = 4.17$, $p < 0.001$). However, no significant differences were found for perceived financial between low and high design aesthetics ($M_{low} = 3.84$, $M_{high} = 4.17$, $p = 0.138$). Therefore, it can be concluded that perceived financial risks for moderate design aesthetics are lower as compared to low and high design aesthetics supporting hypothesis 2c and 3c.

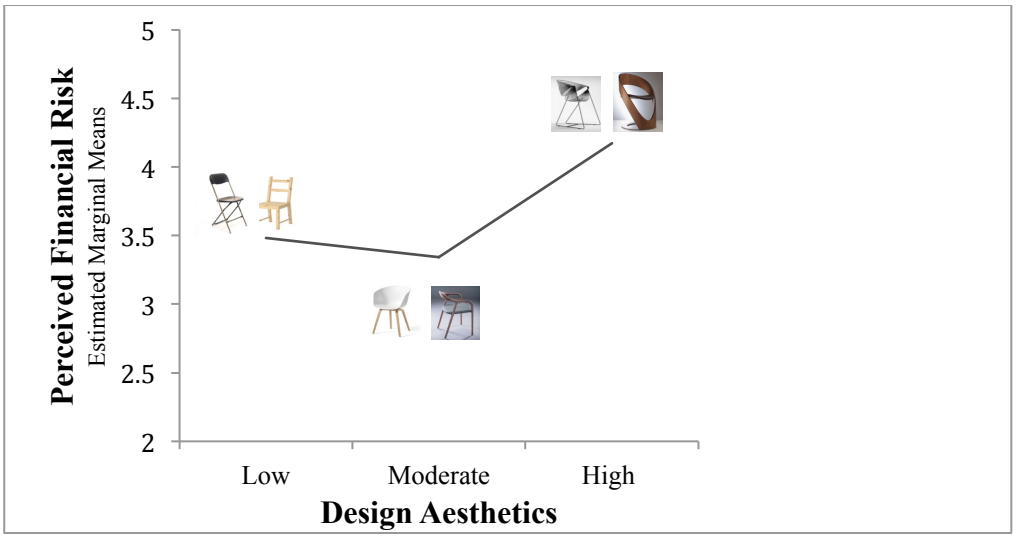
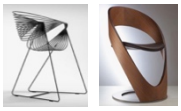


Figure 7. Direct effect of design aesthetics on perceived financial risk.

Table 30

Post-Hoc Test Results for the Three Levels of Design Aesthetics on Perceived Risks

Perceived Psycho-Social Risk

	Level of Design Aesthetics	Stimuli	*N*	*M*	*SE*	*p*
Pair 1	Low		120	3.61	0.121	0.000
	Moderate		120	2.92	0.090	
Pair 2	Moderate		120	2.92	0.090	0.000
	High		120	3.44	0.121	

Perceived Functional Risk

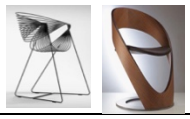
	Level of Design Aesthetics	Stimuli	*N*	*M*	*SE*	*p*
Pair 1	Low		120	3.58	0.100	0.000
	Moderate		120	2.83	0.080	
Pair 2	Moderate		120	2.83	0.080	0.042
	High		120	3.11	0.111	

Table 30 (continued)

Perceived Financial Risk

	Level of Design Aesthetics	Stimuli	*N*	*M*	*SE*	*p*
Pair 1	Low		120	3.84	0.119	0.002
	Moderate		120	3.34	0.102	
Pair 2	Moderate		120	3.34	0.102	0.000
	High		120	4.17	0.128	

Influence of Perceived Risks on Purchase Intentions

Hypothesis 4. Hypothesis 4 proposed an influence of perceived risks on purchase intentions, such that perceived risks [a) psycho-social, b) functional, and c) financial risk perceptions] will have a negative influence on consumers' purchase intentions. Multiple linear regression was used to test this hypothesis. Financial risk had a significant, negative influence on purchase intentions (β= - 0.67, $t(116)$ = - 6.50, $p < 0.001$). However, psycho-social (B = - 0.14, $t(116)$ = - 1.28, p = 0.205) and functional risks (B = - 0.14, $t(116)$ = - 1.04, p = 0.272) did not show a significant relationship. As indicated in the preliminary analyses, multicollinearity was a concern for the perceived risks scales. Results of the multiple regression confirmed that multicollinearity was a concern (psycho social risk: *Tolerance* = .580, *VIF* = 1.725; functional

risk: *Tolerance* = .728, *VIF* = 1.373; financial risk: *Tolerance* = .592, *VIF* = 1.689); with financial risk being highly correlated with the psycho-social and functional risk dimensions.

Due to the issue of multicollinearity, three simple linear regressions were conducted to test each perceived risk dimension's influence on purchase intentions individually. Results showed that all three dimensions of risks had a significant negative influence on purchase intentions. Perceived psycho-social risk significantly predicted purchase intentions, $F(1,118) = 39.369$, $p < .001$ and accounted for 25% of purchase intentions with adjusted $R^2 = 24.4\%$, a medium size effect according to Cohen (1988). The significant, negative effect of perceived psycho-social risk supported hypothesis 4a. Next, perceived functional risk significantly predicted purchase intentions, $F(1,118) = 22.645$, $p < .001$ and accounted for 16.1% of purchase intentions with adjusted $R^2 = 15.4\%$, a medium size effect according to Cohen (1988), supporting hypothesis 4b. Last, perceived financial risks significantly predicted purchase intentions, $F(1,118) = 99.693$, $p < .001$ and accounted for 67.7% of purchase intentions with adjusted $R^2 = 45.8\%$, a large size effect according to Cohen (1988), supporting hypothesis 4c. Of the three perceived risks dimensions, financial risk had the highest influence on purchase intentions (Table 31).

Table 31

Simple Regression Results: Influence of Perceived Risks on Purchase Intentions

Perceived Risk Dimension	*β*	*F*	*df*	*p*	R^2
Financial	-0.800	99.69	118	0.000	45.80%
Psycho-Social	-0.618	39.369	118	0.000	25.00%
Functional	-0.648	22.65	118	0.000	16.10%

Mediating Effect of Perceived Risks

Hypothesis 5. Hypothesis 5 proposed a mediation effect for perceived risks, such that perceived risks [a) psycho-social, b) functional, and c) financial risk perceptions] will mediate the relationship between design aesthetics and purchase intentions. The model was tested following the four steps indicated by Hayes (2013) using the PROCESS macro in the SPSS software by testing if the effect of an antecedent (X) on an outcome (Y) is completely mediated by a third variable (M). The three simple correlations (r_{XY}, r_{XM}, and r_{MY}) should be significant. However, for a full mediation, the relationship between X and Y should become non-significant when M is controlled. Thus, for this study's analysis, first the three simple correlations (design aesthetics – purchase intentions, design aesthetics – perceived risks, perceived risks – purchase intentions) should be significant whereas the relation between design aesthetics on purchase intentions should become insignificant when perceived risks are controlled. In other words, Hayes (2013) four steps to follow testing for mediation included: 1) the relationship between design aesthetics and purchase intentions is significant (path c); 2) design aesthetics is significantly related to all three levels of perceived risks (path a); 3) the relationship between all

three levels of perceived risks and purchase intentions is significant (path b); and 4) the relationship between design aesthetic and purchase intentions becomes insignificant when perceived risks are controlled, a full mediation can be concluded. However, if the relationship between perceived risks and purchase intentions was insignificant, no mediation was concluded.

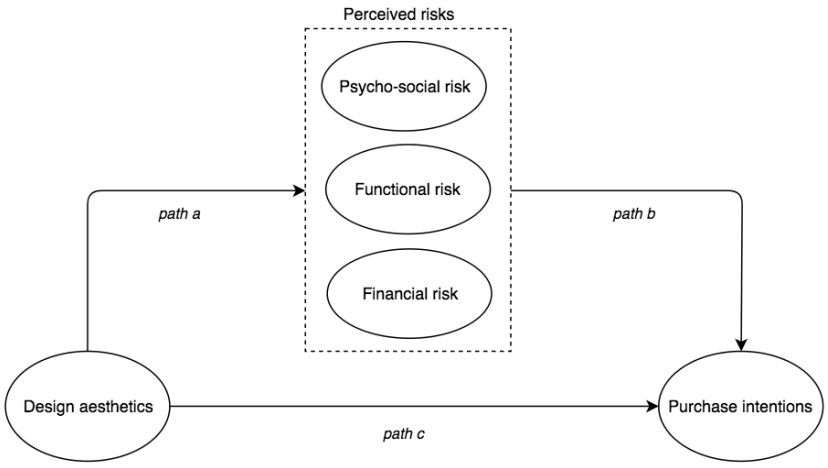


Figure 8. Mediation of perceived risks.

Hayes model 4 (2013) testing simple mediations was implemented to investigate hypotheses 5 a – 5c hypothesizing that all three levels of perceived risks will mediate the effect of design aesthetics on purchase intentions. Due to multicollinearity issues, each risk dimension was treated as a separate mediator, such that three simple mediation models were tested. To allow the testing of the mediation hypotheses, design aesthetics was treated as a continuous (measured) variable instead of a categorical variable. This step had to be undertaken because the variable was implemented as a within-subjects variable in the experiment.

The first regression was conducted with psycho-social risk as a mediator. The analysis was run in four steps according to Hayes model 4 (2013). In Step 1 (path c) of the mediation model, the regression of design aesthetics on purchase intentions, ignoring the mediator, was significant, $F(1,118) = 65.03$, $p < 0.001$, $R^2 = 35.5\%$, $B = 0.83$, $t(118) = 8.06$, $p < 0.001$. Step 2 (path a) showed that the regression of design aesthetics on the mediator, psycho-social risks, was also significant, $F(1,118) = 18.37$, $p < 0.001$, $R^2 = 13.47\%$, $B = -0.41$, $t(118) = -4.29$, $p < 0.001$. Step 3 (path b) of the mediation process showed that the regression of the mediator (psycho-social risks) on purchase intentions was significant, $B = -0.40$, $t(117) = -4.40$ $p < 0.001$. Step 3b of the analyses revealed that, controlling for the mediator (psycho-social risks), design aesthetics remained a significant predictor of purchase intentions, $B = -0.66$, $t(117) = 6.44$, $p < 0.001$. However, the effect was reduced with results showing a reduced beta coefficient. Last, a Sobel test was conducted and confirmed the mediation in the model ($Z = 0.0546$, $p = 0.0024$, $R^2 = 15.87\%$). Thus, it was found that psycho-social risk partially mediated the relationship between design aesthetics and purchase intentions, thus partially supporting hypothesis 5a.

The next regression was conducted with functional risk as a mediator. In Step 1 (path c) of the mediation model, the regression of design aesthetics on purchase intentions, ignoring the mediator, was significant, $F(1,118) = 65.03$, $p < 0.001$, $R^2 = 35.5\%$, $B = 0.83$, $t(118) = 8.06$, $p < 0.001$. Step 2 (path a) showed that the regression of design aesthetics on the mediator, functional risks, was also significant, $F(1,118) = 18.37$, $p < 0.001$, $R^2 = 22.19\%$, $B = -0.42$, $t(118) = -5.80$, $p < 0.001$. Step 3a (path b) of the mediation process showed that the regression of the mediator (functional risk) on purchase intentions was partially significant, $B = -0.25$, $t(117) = -1.87$, $p = 0.064$. Step 3b of the analyses revealed that, controlling for the mediator (functional risk), design

aesthetics remained a significant predictor of purchase intentions, $B = 0.72$, $t(117) = 6.31$, $p < 0.001$. However, the effect was reduced with results showing a reduced beta coefficient. Last, a Sobel test was conducted and confirmed the mediation in the model ($Z = 1.75$, $p = 0.079$, $R^2 = 6.34\%$). Thus, it was found that functional risk partially mediated the relationship between design aesthetics and purchase intentions, thus partially supporting hypothesis 5b.

The last regression was conducted with financial risk as a mediator. In Step 1 (path c) of the mediation model, the regression of design aesthetics on purchase intentions, ignoring the mediator, was significant, $F(1,118) = 65.03$, $p < 0.001$, $R^2 = 35.5\%$, $B = 0.83$, $t(118) = 8.06$, $p < 0.001$. Step 2 (path a) showed that the regression of design aesthetics on the mediator, financial risks, was also significant, $F(1,118) = 26.94$, $p < 0.001$, $R^2 = 18.59\%$, $B = -0.51$, $t(118) = -5.18$, $p < 0.001$. Step 3a (path b) of the mediation process showed that the regression of the mediator (financial risk) on purchase intentions was significant, $B = -0.61$, $t(117) = -7.69$, $p < 0.001$. Step 3b of the analyses revealed that, controlling for the mediator (financial risk), design aesthetics was still a significant predictor of purchase intentions, $B = 0.51$, $t(117) = 5.57$, $p < 0.001$. However, psycho-social risks minimized the effect of design aesthetics, since the beta coefficient was reduced as compared to the model in step 1. A Sobel test confirmed the mediation in the model ($Z = 4.277$, $p < 0.001$, $R^2 = 24.15\%$). Thus, it can be concluded that financial risk partially mediated the relationship between design aesthetics and purchase intentions, partially supporting hypothesis 5c.

Moderating Effect of Aesthetic Expertise on Perceived Risks

Hypothesis 6. Hypothesis 6 proposed that aesthetic expertise will moderate the effect of design aesthetics on all dimensions of perceived risks. Repeated measures ANCOVA revealed a

statistically significant interaction between aesthetic expertise and design aesthetics on perceived financial risk, $F(1.873, 215.38) = 4.32$, $p = 0.016$, *partial η2* = .036 supporting hypothesis 6c. There was no statistically significant interaction between aesthetic expertise and design aesthetics on perceived psycho-social risk, $F(1.230, 198.361) = 0.747$, $p = 0.457$, *partial η2* = .006 or perceived functional risk, $F(1.856, 213.479) = 0.351$, $p = 0.688$, *partial η2* = .003. Hence, H6a and b were not supported.

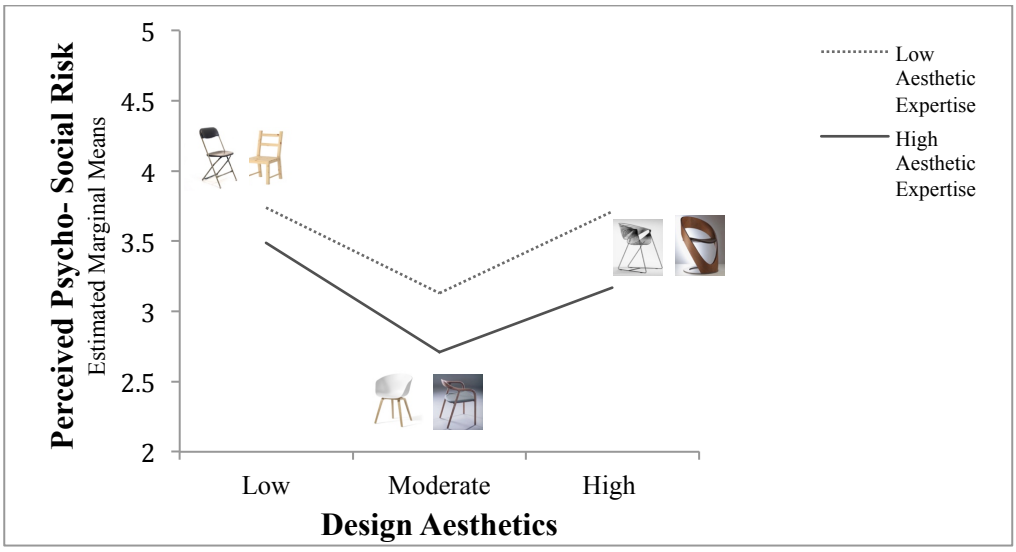


Figure 9. Interaction effect of design aesthetics and aesthetic expertise on perceived psycho-social risks.

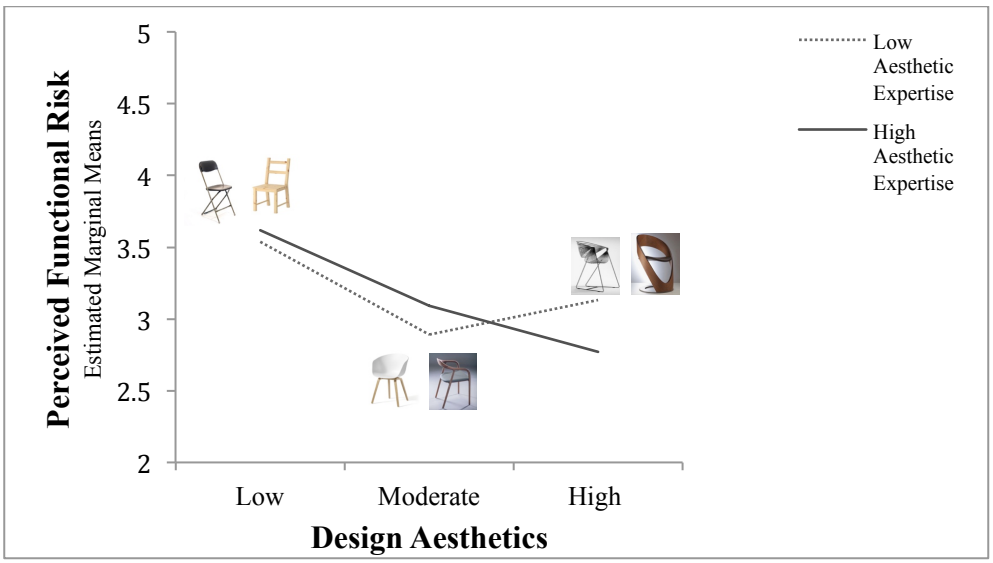


Figure 10. Interaction effect of design aesthetics and aesthetic expertise on perceived functional risks.

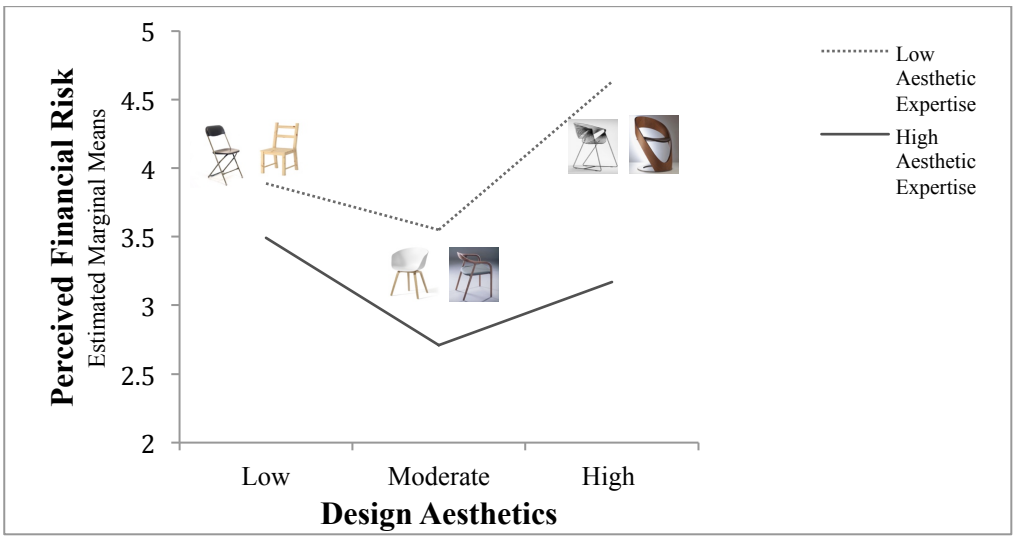


Figure 11. Interaction effect of design aesthetics and aesthetic expertise on perceived financial risks.

Hypothesis 8. Hypothesis 8 proposed that for low aesthetic expertise, moderate design aesthetics will lead to lower risk perceptions [a) psycho-social, b) functional, and c) financial risk perceptions] associated with a product than 1) low or 2) high design aesthetics. Repeated measures ANCOVA revealed that for low aesthetic expertise, psychological-social risk perceptions significantly differed between low and moderate design aesthetics (M_{low} = 3.74, M_{mod} = 3.13, p = .006) as well as moderate and high design aesthetics (M_{high}= 3.71, M_{mod} = 3.13, p = .001), such that moderate design aesthetics led to lower social risk perceptions than low and high design aesthetics supporting hypothesis 8a1 and 8a2. Psycho-social risk perceptions did not significantly differ for low and high design aesthetics (M_{low} = 3.13, M_{high} = 3.71, p = 1.00).

Further, the analysis revealed that for low aesthetic expertise, functional risk perceptions significantly differed between low and moderate design aesthetics (M_{low} = 3.54, M_{mod} = 2.89, p = .002) such that moderate design aesthetics led to lower functional risk perceptions than low aesthetics supporting hypothesis 8b1. Differences between low and high design aesthetics (M_{low} = 3.54, M_{high} = 3.13, p = .194) as well as moderate and high design aesthetics was not significant (M_{high}= 3.13, M_{mod} = 2.89, p = .378). However, functional risk perceptions for moderate design aesthetics were not significantly lower than high design aesthetics showing the proposed direction, but without reaching significance. Hence, H8b2 was not supported.

Additionally, for low aesthetic expertise, financial risk perceptions were lower for moderate than low design aesthetics, but not significantly different (M_{low} = 3.89, M_{mod} = 3.55, p = .307) rejecting hypothesis 8c1. Perceived financial risks were significantly different between moderate and high design aesthetics, with lower perceived financial risks for moderate design aesthetics (M_{high}= 4.63, M_{mod} = 3.55, p < .001) supporting hypothesis 8c2. In general, moderate

design aesthetics led to lower financial risk perceptions than low and high design aesthetics. Financial risk perceptions did also significantly differ for low and high design aesthetics (M_{low} = 3.89, M_{high} = 4.63, p = .008), such that low design aesthetics led to lower financial risk perceptions than high design aesthetics.

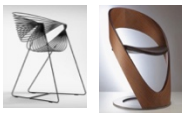
Table 32

Simple Effects of Design Aesthetics on Perceived Risks for Low Aesthetic Expertise Group

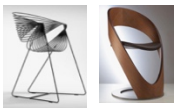
Perceived Psycho-Social Risk						
	Level of Design Aesthetics	*Stimuli*	*N*	*M*	*SE*	*p*
Pair 1	Low		120	3.74	0.172	0.006
	Moderate		120	3.13	0.128	
Pair 2	Moderate		120	3.13	0.128	0.001
	High		120	3.71	0.168	

Table 32 (continued)

Perceived Functional Risk

	Level of Design Aesthetics	Stimuli	*N*	*M*	*SE*	*p*
Pair 1	Low		120	3.54	0.150	0.002
	Moderate		120	2.89	0.112	
Pair 2	Moderate		120	2.89	0.112	0.378
	High		120	3.13	0.152	

Perceived Financial Risk

	Level of Design Aesthetics	Stimuli	*N*	*M*	*SE*	*p*
Pair 1	Low		120	3.89	0.165	0.307
	Moderate		120	3.55	0.146	
Pair 2	Moderate		120	3.55	0.146	0.000
	High		120	4.63	0.183	

Hypothesis 10. Hypothesis 10 proposed that for high aesthetic expertise, high design aesthetics will lead to lower risk perceptions [a) psycho-social, b) functional, and c) financial risk perceptions] associated with a product than 1) low or 2) moderate design aesthetics. Repeated measures ANCOVA revealed that for high aesthetic expertise, psychological-social risk perceptions differed between low and high design aesthetics (M_{low} = 3.49, M_{high}= 3.17, p = .502), such that high design aesthetics led to lower psycho-social risks. However, the effect did not reach significance, rejecting hypothesis10a1. Perceived psycho-social risks differed for moderate and high design aesthetics (M_{high}= 3.17, M_{mod} = 2.71, p = .012), such that moderate design aesthetics led to lower psych-social risk perceptions than high design aesthetics rejecting hypothesis 10a2. Further, psycho-social risk perceptions did significantly differ for low and moderate design aesthetics, such that moderate design aesthetics led to lower psycho-social risks (M_{low} = 3.45, M_{mod} = 3.17, p < .001).

The analysis also revealed that for high aesthetic expertise, functional risk perceptions differed significantly between low and high design aesthetics (M_{low} = 3.62, M_{high}= 3.09, p = .036), such that high design aesthetics led to lower functional risks, supporting hypothesis 10b1. Perceived functional risks differed for moderate and high design aesthetics (M_{high}= 3.09, M_{mod} = 2.77, p = .165), with moderate design aesthetics leading to lower psycho-social risk perceptions than high design aesthetics, which is contrary to what was predicted. Also, the effect did not reach significance, rejecting hypothesis 10b2. Further, functional risk perceptions did significantly differ for low and moderate design aesthetics, such that moderate design aesthetics led to lower functional risks (M_{low} = 3.62, M_{mod}= 3.09, p < .001).

Further, ANCOVA with repeated measures showed that for high aesthetic expertise, financial risk perceptions did not differ between low and high design aesthetics (M_{low} = 3.78, M_{high}= 3.71, p = 1.00), rejecting hypothesis 10c1. Perceived financial risks significantly differed for moderate and high design aesthetics (M_{high}= 3.71, M_{mod} = 3.13, p = 0.003), with moderate design aesthetics leading to lower financial risk perceptions than high design aesthetics, which is contrary to what was predicted, rejecting hypothesis10c2. Further, financial risk perceptions did significantly differ for low and moderate design aesthetics, such that moderate design aesthetics led to lower financial risks (M_{low} = 3.78, M_{mod}= 3.13, p = .004).

Table 33

Simple Effects of Design Aesthetics on Perceived Risks for High Aesthetic Expertise Group

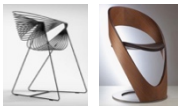
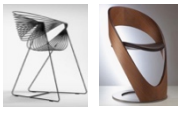
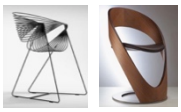
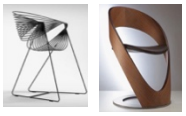
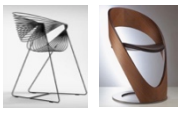
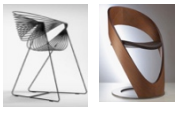
Perceived Psycho-Social Risk						
	Level of Design Aesthetics	Stimuli	*N*	*M*	*SE*	*p*
Pair 1	Low		120	3.49	0.170	0.502
	High		120	3.17	0.175	
Pair 2	Moderate		120	2.71	0.124	0.012
	High		120	3.17	0.175	

Table 33 (continued)

Perceived Functional Risk

	Level of Design Aesthetics	Stimuli	*N*	*M*	*SE*	*p*
Pair 1	Low		120	3.62	0.134	0.036
	High		120	3.09	0.162	
Pair 2	Moderate		120	2.77	0.115	0.165
	High		120	3.09	0.162	

Perceived Financial Risk

	Level of Design Aesthetics	Stimuli	*N*	*M*	*SE*	*p*
Pair 1	Low		120	3.78	0.171	1.000
	High		120	3.71	0.181	
Pair 2	Moderate		120	3.13	0.142	0.001
	High		120	3.71	0.181	

Moderating Effect of Aesthetic Expertise on Purchase Intentions

Hypothesis 7. Hypothesis 7 proposed that aesthetic expertise moderates the effect of design aesthetics on purchase intentions. Repeated measures ANCOVA revealed a statistically significant interaction between aesthetic expertise and design aesthetics on purchase intentions, $F(1.696, 195.06) = 4.299$, $p = 0.02$, *partial η2* = .036 supporting hypothesis 7.

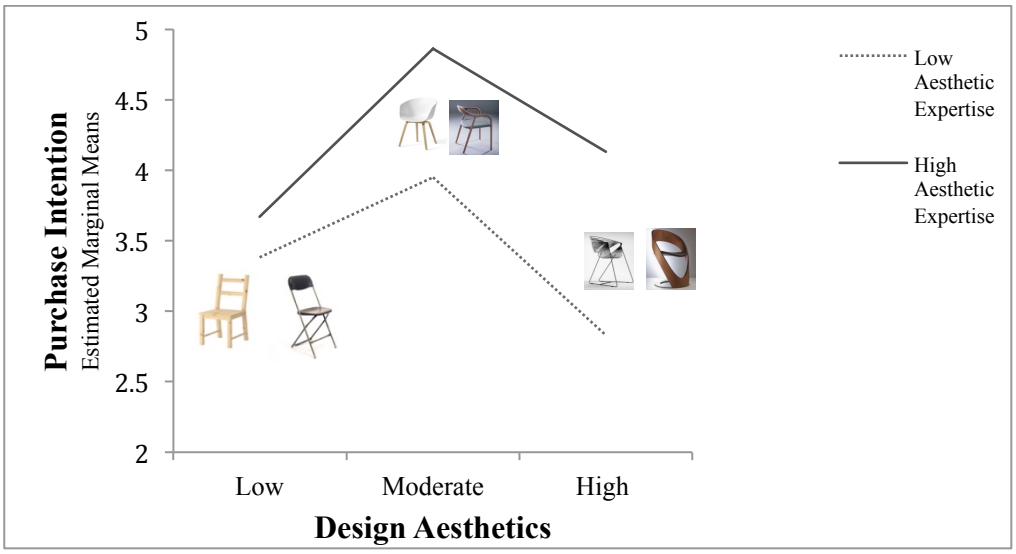


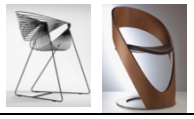
Figure 12. Interaction effect of design aesthetics and aesthetic expertise on purchase intentions.

Hypothesis 9. Hypothesis 9 proposed that for low aesthetic expertise, moderate design aesthetics leads to higher purchase intentions than a) low or b) high design aesthetics. Repeated measures ANCOVA revealed that for low aesthetic expertise, purchase intentions significantly differed between low and moderate design aesthetics ($M_{low} = 3.38$, $M_{mod} = 3.95$, $p = .034$) as well as moderate and high design aesthetics ($M_{high} = 2.83$, $M_{mod} = 3.95$, $p < .001$), such that moderate design aesthetics led to higher purchase intentions as compared to low and high design

aesthetics, supporting hypotheses 9a and 9b. Purchase intentions did not significantly differ for low and high design aesthetics (M_{low} = 3.38, M_{high} = 2.83, p = .149).

Table 34

Simple Effects of Design Aesthetics on Purchase Intentions for Low Aesthetic Expertise Group

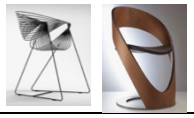
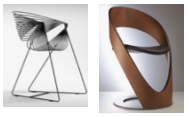
	Level of Design Aesthetics	Stimuli	*N*	*M*	*SE*	*p*
Pair 1	Low		120	3.38	0.178	0.034
	Moderate		120	3.95	0.172	
Pair 2	Moderate		120	3.95	0.172	0.000
	High		120	2.83	0.223	

Hypothesis 11. Hypothesis 11 proposed that for experts, high design aesthetics leads to higher purchase intentions than a) low or b) moderate design aesthetics. Repeated measures ANCOVA revealed that for high aesthetic expertise, purchase intentions were higher for high design aesthetics as compared to low (M_{low} = 3.67, M_{high} = 4.13, p = .530), but the effect was not statistically significant rejecting hypothesis 11a. There were significant differences between purchase intentions for moderate and high design aesthetics (M_{high}= 4.13, M_{mod} = 4.86, p = .001), such that moderate design aesthetics led to higher purchase intentions as compared to high

design aesthetics. This effect was contrary to what was proposed, thus, not supporting hypothesis 11b. Further, there were significant differences between low and moderate design aesthetics ($M_{low} = 3.67$, $M_{mod} = 4.86$, $p < .001$), such that moderate design aesthetics led to higher purchase intentions than low design aesthetics.

Table 35

Simple Effects of Design Aesthetics on Purchase Intentions for High Aesthetic Expertise Group

	Level of Design Aesthetics	Stimuli	*N*	*M*	*SE*	*p*
Pair 1	Low		120	3.67	0.198	0.530
	High		120	4.13	0.153	
Pair 2	Moderate		120	4.86	0.153	0.001
	High		120	4.13	0.229	

Moderating Effect of Product Confidence on Perceived Risks

Hypothesis 12. Hypothesis 12 proposed a moderating effect of product confidence (high vs. low) on the effect of design aesthetics (low, moderate, high) on risk perceptions (a. psycho-social risk, b. functional risk, c. financial risk). Repeated measures ANCOVA revealed a statistically significant interaction between product confidence and design aesthetics on

perceived financial risk, $F(1.873, 215.38) = 4.36$, $p = 0.016$, *partial* $\eta 2 = 0.036$, supporting hypothesis 12c. There was no statistically significant interaction between product confidence and design aesthetics on perceived psycho-social risk, $F(1.725, 198.361) = 1.61$, $p = 0.206$, *partial* $\eta 2 = .014$, or functional risk, $F(1.856, 213.479) = 1.34$, $p = 0.264$, *partial* $\eta 2 = .011$. Hence, hypotheses 12a and b were not supported.

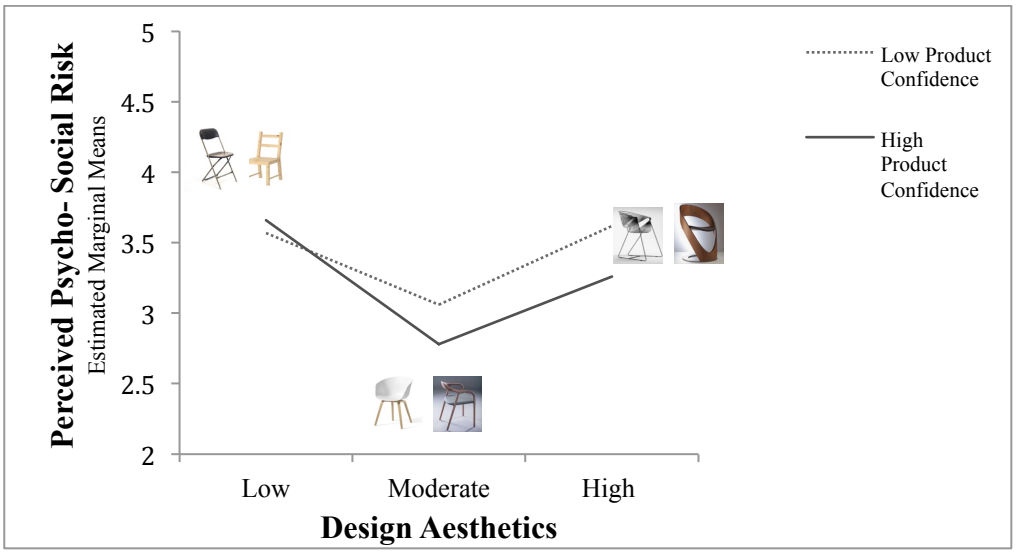


Figure 13. Interaction effect of design aesthetics and product confidence on perceived psycho-social risk.

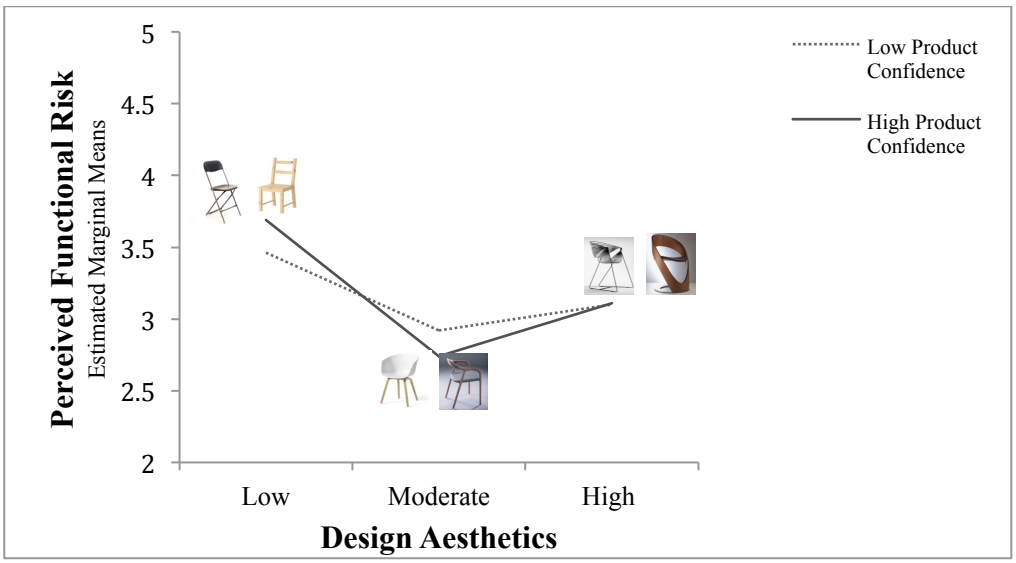


Figure 14. Interaction effect of design aesthetics and product confidence on perceived functional risk.

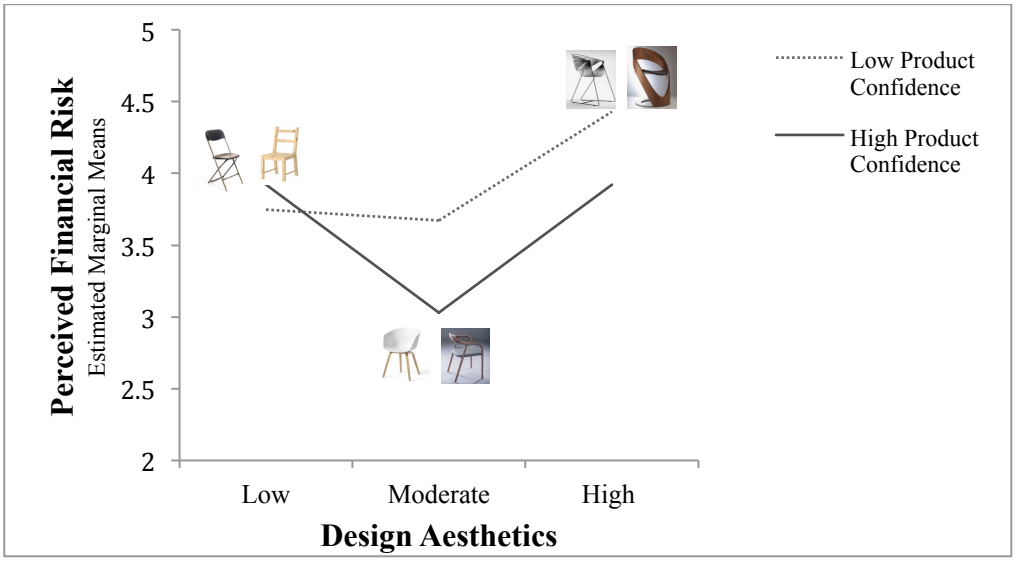


Figure 15. Interaction effect of design aesthetics and product confidence on perceived financial risk.

Hypothesis 14. Hypothesis 14 proposed when product confidence is low, moderate design aesthetics leads to lower risk perceptions (a. psycho-social risk, b. functional risk, c. financial risk) associated with a product than 1) low or 2) high design aesthetics. Repeated measures ANCOVA revealed that for low product confidence, psycho-social risk perceptions significantly differed between low and moderate design aesthetics (M_{low} = 3.57, M_{mod} = 3.06, p = .019) as well as moderate and high design aesthetics (M_{high}= 3.62, M_{mod} = 3.06, p = .001), such that moderate design aesthetics led to lower social risk perceptions than low or high design aesthetics, supporting hypothesis 14a1 and 14a2. Psycho-social risk perceptions did not significantly differ for low and high design aesthetics (M_{low} = 3.57, M_{high} = 3.62, p = 1.00).

Further, the analysis revealed that for low product confidence, functional risk perceptions significantly differed between low and moderate design aesthetics (M_{low} = 3.46, M_{mod} = 2.92, p = .001) such that moderate design aesthetics led to lower functional risk perceptions than low design aesthetics, supporting hypothesis 14b1. Differences between low and high design aesthetics (M_{low} = 3.46, M_{high} = 3.10, p = .124) as well as moderate and high design aesthetics were not statistically significant (M_{high}= 3.10, M_{mod} = 2.92, p = .501). However, moderate design aesthetics functional risk perceptions were lower than high design aesthetics showing the proposed direction, but without reaching significance. Hypothesis 14b2 was not supported.

Additionally, for low product confidence, financial risk perceptions were lower for moderate design aesthetics, but not significantly different (M_{low} = 3.75, M_{mod} = 3.66, p = 1.00) rejecting hypothesis 14c1. Perceived financial risks were significantly different between moderate and high design aesthetics, with lower perceived financial risks for moderate design aesthetics (M_{high}= 4.43, M_{mod} = 3.66, $p < .001$), supporting hypothesis 14c2. In general, moderate

design aesthetics led to lower financial risk perceptions than low and high design aesthetics. Financial risk perceptions did also significantly differ for low and high design aesthetics (M_{low} = 3.75, M_{high} = 4.43, p = .012), such that low design aesthetics led to lower financial risk perceptions than high design aesthetics.

Table 36

Simple Effects of Design Aesthetics on Perceived Risks for Low Product Confidence

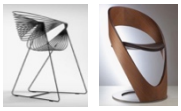
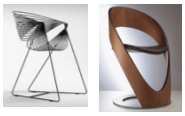
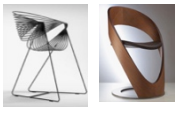
Perceived Psycho-Social Risk						
	Level of Design Aesthetics	Stimuli	*N*	*M*	*SE*	*p*
Pair 1	Low		120	3.57	0.177	0.019
	Moderate		120	3.06	0.119	
Pair 2	Moderate		120	3.06	0.119	0.001
	High		120	3.62	0.153	

Table 36 (continued)

Perceived Functional Risk

	Level of Design Aesthetics	Stimuli	*N*	*M*	*SE*	*p*
Pair 1	Low		120	3.46	0.107	0.001
	Moderate		120	2.92	0.119	
Pair 2	Moderate		120	2.92	0.119	0.501
	High		120	3.10	0.129	

Perceived Financial Risk

	Level of Design Aesthetics	Stimuli	*N*	*M*	*SE*	*p*
Pair 1	Low		120	3.75	0.155	1.000
	Moderate		120	3.67	0.150	
Pair 2	Moderate		120	3.67	0.150	0.000
	High		120	4.43	0.157	

Hypothesis 16. Hypothesis 16 proposed when product confidence is high, high design aesthetics leads to lower risk perceptions (a. psycho-social risk, b. functional risk, c. financial risk) associated with a product than 1) low or 2) moderate design aesthetics. Repeated measures ANCOVA revealed that for high product confidence, psycho-social risk perceptions differed between low and high design aesthetics (M_{low} = 3.66, M_{high}= 3.26, p = .201), such that high design aesthetics led to lower psycho-social risks. However, the effect did not reach significance, rejecting hypothesis 16a1. Perceived psycho-social risks differed for moderate and high design aesthetics (M_{high}= 3.26, M_{mod} = 2.78, p = .011), such that moderate design aesthetics led to lower psych-social risk perceptions than high design aesthetics. This effect was contrary to what was proposed, rejecting hypothesis 16a2. Further, psycho-social risk perceptions did significantly differ for low and moderate design aesthetics, such that moderate design aesthetics led to lower psycho-social risks (M_{low} = 3.66, M_{mod} = 2.78, p < .001).

The analysis also revealed that for high product confidence, functional risk perceptions differed marginally significantly between low and high design aesthetics (M_{low} = 3.69, M_{high}= 3.11, p = .059), such that high design aesthetics led to lower functional risks, marginally supporting hypothesis 16b1. Perceived functional risks differed for moderate and high design aesthetics (M_{high}= 3.11, M_{mod} = 2.74, p = .114), with moderate design aesthetics leading to lower functional risk perceptions than high design aesthetics, which is contrary to what was predicted. Also, the effect did not reach significance, rejecting hypothesis 16b2. Further, functional risk perceptions did significantly differ for low and moderate design aesthetics, such that moderate design aesthetics led to lower functional risks (M_{low} = 3.69, M_{mod}= 2.74, p < .001).

Further, ANCOVA with repeated measures also revealed that for high product confidence, financial risk perceptions did not differ between low and high design aesthetics (M_{low} = 3.92, M_{high}= 3.92, p = 1.00), such that both design levels led to equal financial risk perceptions, rejecting hypothesis 16c1. Perceived financial risks significantly differed for moderate and high design aesthetics (M_{high}= 3.92, M_{mod} = 3.03, p < .001), with moderate design aesthetics leading to lower financial risk perceptions than high design aesthetics, which is contrary to what was predicted, rejecting hypothesis 16c2. Further, financial risk perceptions did significantly differ for low and moderate design aesthetics, such that moderate design aesthetics led to lower financial risks (M_{low} = 3.92, M_{mod}= 3.03, p < .001).

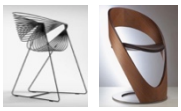
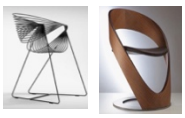
Table 37

Simple Effects of Design Aesthetics on Perceived Risks for High Product Confidence

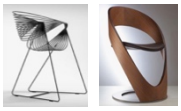
Perceived Psycho-Social Risk						
	Level of Design Aesthetics	Stimuli	*N*	*M*	*SE*	*p*
Pair 1	Low		120	3.66	0.168	0.201
	High		120	3.26	0.187	
Pair 2	Moderate		120	2.78	0.134	0.011
	High		120	3.26	0.187	

Table 37 (continued)

Perceived Functional Risk

	Level of Design Aesthetics	Stimuli	*N*	*M*	*SE*	*p*
Pair 1	Low		120	3.69	0.167	0.059
	High		120	3.11	0.1678	
Pair 2	Moderate		120	2.74	0.109	0.114
	High		120	3.11	0.1678	

Perceived Financial Risk

	Level of Design Aesthetics	Stimuli	*N*	*M*	*SE*	*p*
Pair 1	Low		120	3.92	0.178	1.000
	High		120	3.92	0.195	
Pair 2	Moderate		120	3.03	0.138	0.000
	High		120	3.92	0.195	

Moderating Effect of Product Confidence on Purchase Intentions

Hypothesis 13. Hypothesis 13 proposed a moderating effect of product confidence (high vs. low) on the effect of design aesthetics (low, moderate, high) and purchase intentions. Repeated measures ANCOVA revealed a statistically significant interaction between product confidence and design aesthetics on purchase intentions, $F(1.696, 195.06) = 3.94$, $p = 0.027$, *partial η2* = .033, supporting hypothesis 13.

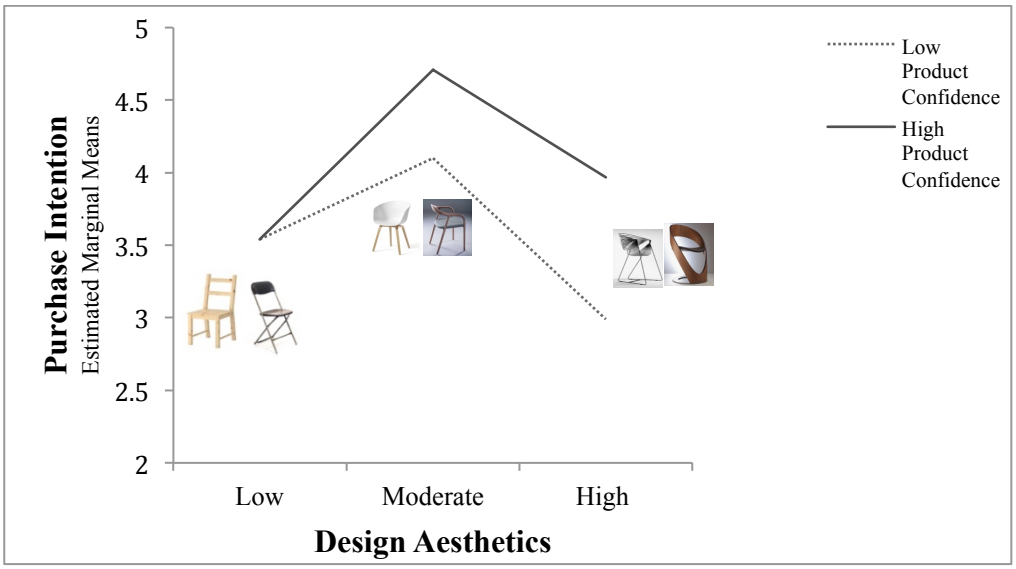


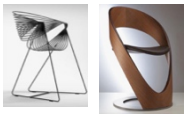
Figure 16. Interaction effect of design aesthetics and product confidence on purchase intentions.

Hypothesis 15. Hypothesis 15 proposed when product confidence is low, moderate design aesthetics leads to higher purchase intentions than a) low or b) high design aesthetics. Repeated measures ANCOVA revealed that for low product confidence, purchase intentions differed marginally between low and moderate design aesthetics ($M_{low} = 3.54$, $M_{mod} = 4.10$, $p = .086$) and significantly differed between moderate and high design aesthetics ($M_{high} = 2.99$, M_{mod}

= 4.10, $p < .001$), such that moderate design aesthetics led to higher purchase intentions as compared to low and high design aesthetics, marginally supporting hypothesis 15a and fully supporting hypothesis 15b. Purchase intentions did not significantly differ for low and high design aesthetics ($M_{low} = 3.54$, $M_{high} = 4.10$, $p = .28$).

Table 38

Simple Effects of Design Aesthetics on Purchase Intentions for Low Product Confidence

	Level of Design Aesthetics	Stimuli	*N*	*M*	*SE*	*p*
Pair 1	Low		120	3.54	0.194	0.086
	Moderate		120	4.10	0.161	
Pair 2	Moderate		120	4.10	0.161	0.000
	High		120	2.99	0.222	

Hypothesis 17. Hypothesis 17 proposed when product confidence is high, high design aesthetics leads to higher purchase intentions than a) low or b) moderate design aesthetic. Repeated measures ANCOVA revealed that for high product confidence, purchase intentions were higher for high design aesthetics as compared to low ($M_{low} = 3.54$, $M_{high} = 3.97$, $p = .375$), but the effect was not statistically significant, rejecting hypothesis 17a. There were significant

differences between purchase intentions for moderate and high design aesthetics (M_{high}= 3.97, M_{mod} = 4.71, $p < .001$), such that moderate design aesthetics led to higher purchase intentions as compared to high design aesthetics. This effect was contrary to what was proposed, thus hypothesis 17b was not supported. Further, significant differences between low and moderate design aesthetics (M_{low} = 3.54, M_{mod} = 4.71, $p < .001$) were found, such that moderate design aesthetics led to higher purchase intentions than low design aesthetics. Table 40 shows a summary of all hypotheses testing results.

Table 39

Simple Effects of Design Aesthetics on Purchase Intentions for High Product Confidence

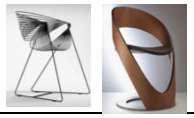
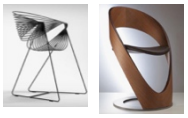
	Level of Design Aesthetics	Stimuli	*N*	*M*	*SE*	*p*
Pair 1	Low		120	3.54	0.181	0.375
	High		120	3.97	0.226	
Pair 2	Moderate		120	4.71	0.164	0.000
	High		120	3.97	0.226	

Table 40

Hypotheses Testing Results

1a	Design aesthetics will have a direct effect on purchase intentions, such that purchase intentions will be higher for moderate design aesthetics as compared to low design aesthetics	S
1b	Design aesthetics will have a direct effect on purchase intentions, such that purchase intentions will be higher for moderate design aesthetics as compared to high design aesthetics	S
2a	Design aesthetics will have a direct effect on consumers' risk perceptions, such that there will be lower psycho-social risk perceptions associated with a product having moderate than high design aesthetics.	S
2b	Design aesthetics will have a direct effect on consumers' risk perceptions, such that there will be lower functional risk perceptions risk perceptions associated with a product having moderate than high design aesthetics.	S
2c	Design aesthetics will have a direct effect on consumers' risk perceptions, such that there will be lower financial risk perceptions associated with a product having moderate than high design aesthetics.	S
3a	Design aesthetics will have a direct effect on consumers' risk perceptions, such that there will be lower psycho-social risk perceptions associated with a product having moderate than low design aesthetics.	S
3b	Design aesthetics will have a direct effect on consumers' risk perceptions, such that there will be lower functional risk perceptions associated with a product having moderate than low design aesthetics.	S
3c	Design aesthetics will have a direct effect on consumers' risk perceptions, such that there will be lower financial risk perceptions associated with a product having moderate than low design aesthetics.	S
4a	Perceived psycho-social risks will have a negative influence on consumers' purchase intentions.	S
4b	Perceived functional risks will have a negative influence on consumers' purchase intentions.	S

Table 40 (continued)

4c	Perceived financial risks will have a negative influence on consumers' purchase intentions.	S
5a	Perceived psycho-social risks will mediate the relationship between design aesthetics and purchase intentions.	P/S
5b	Perceived functional risks will mediate the relationship between design aesthetics and purchase intentions.	P/S
5c	Perceived financial risks will mediate the relationship between design aesthetics and purchase intentions.	P/S
6a	The effect of design aesthetics (low, moderate, high) on risk psycho-social perceptions associated with a product will be moderated by the consumer's level of aesthetic expertise (high vs. low).	N/S
6b	The effect of design aesthetics (low, moderate, high) on functional risk perceptions associated with a product will be moderated by the consumer's level of aesthetic expertise (high vs. low).	N/S
6c	The effect of design aesthetics (low, moderate, high) on financial risk perceptions associated with a product will be moderated by the consumer's level of aesthetic expertise (high vs. low).	S
7	The effect of design aesthetics (low, moderate, high) on purchase intentions will be moderated by the consumer's level of aesthetic expertise (high vs. low).	S
8a1	For low aesthetic expertise, moderate design aesthetics will lead to lower psycho-social risk perceptions associated with a product than low design aesthetics.	S
8a2	For low aesthetic expertise, moderate design aesthetics will lead to lower psycho-social risk perceptions associated with a product than high design aesthetics.	S
8b1	For low aesthetic expertise, moderate design aesthetics will lead to lower functional risk perceptions associated with a product than low design aesthetics.	S

Table 40 (continued)

8b2	For low aesthetic expertise, moderate design aesthetics will lead to lower risk perceptions functional associated with a product than high design aesthetics.	N/S
8c1	For low aesthetic expertise, moderate design aesthetics will lead to lower financial risk perceptions associated with a product than low design aesthetics.	N/S
8c2	For low aesthetic expertise, moderate design aesthetics will lead to lower risk perceptions financial risk perceptions associated with a product than high design aesthetics.	S
9a	For low aesthetic expertise, moderate design aesthetics will lead to higher purchase intentions than low design aesthetics.	S
9b	For low aesthetic expertise, moderate design aesthetics will lead to higher purchase intentions than high design aesthetics.	S
10a1	For high aesthetic expertise, high design aesthetics will lead to lower psycho-social risk perceptions low design aesthetics.	N/S
10a2	For high aesthetic expertise, high design aesthetics will lead to lower psycho-social risks than moderate design aesthetics.	N/S
10b1	For high aesthetic expertise, high design aesthetics will lead to lower functional risk perceptions low design aesthetics.	S
10b2	For high aesthetic expertise, high design aesthetics will lead to lower functional risk perceptions moderate design aesthetics.	N/S
10c1	For high aesthetic expertise, high design aesthetics will lead to lower financial risk perceptions associated with a product than low design aesthetics.	N/S
10c2	For experts, high design aesthetics will lead to lower financial risk perceptions associated with a product than moderate design aesthetics.	N/S
11a	For high aesthetic expertise, high design aesthetics will lead to higher purchase intentions than low design aesthetics.	N/S

Table 40 (continued)

11b	For high aesthetic expertise, high design aesthetics will lead to higher purchase intentions than moderate design aesthetics.	N/S
12a	The effect of design aesthetics (low, moderate, high) on psycho-social risk perceptions associated with a product will be moderated by consumer confidence in product (high vs. low).	N/S
12b	The effect of design aesthetics (low, moderate, high) on functional risk perceptions associated with a product will be moderated by consumer confidence in product (high vs. low).	N/S
12c	The effect of design aesthetics (low, moderate, high) on financial risk perceptions associated with a product will be moderated by consumer confidence in product (high vs. low).	S
13	The effect of design aesthetics (low, moderate, high) on purchase intentions will be moderated by consumer confidence in product (high vs. low	S
14a1	When consumer confidence in product is low, moderate design aesthetics will lead to lower psycho-social risk perceptions associated with a product than low design aesthetics.	S
14a2	When consumer confidence in product is low, moderate design aesthetics will lead to lower psycho-social risk perceptions associated with a product than high design aesthetics.	S
14b1	When consumer confidence in product is low, moderate design aesthetics will lead to lower functional risk perceptions associated with a product than low design aesthetics.	S
14b2	When consumer confidence in product is low, moderate design aesthetics will lead to lower functional risk perceptions associated with a product than high design aesthetics.	N/S
14c1	When consumer confidence in product is low, moderate design aesthetics will lead to lower financial risk perceptions associated with a product than low design aesthetics.	N/S

Table 40 (continued)

14c2	When consumer confidence in product is low, moderate design aesthetics will lead to lower financial risk perceptions associated with a product than high design aesthetics.	S
15a	When consumer confidence in product is low, moderate design aesthetics will lead to higher purchase intentions than low high design aesthetics.	P/S
15b	When consumer confidence in product is low, moderate design aesthetics will lead to higher purchase intentions than high design aesthetics.	S
16a1	When consumer confidence in product is high, high design aesthetics will lead to lower psycho-social risk perceptions associated with a product than low design aesthetics.	N/S
16a2	When consumer confidence in product is high, high design aesthetics will lead to lower risk perceptions (a. psycho-social risk) associated with a product than moderate design aesthetics.	N/S
16b1	When consumer confidence in product is high, high design aesthetics will lead to lower functional risk perceptions associated with a product than low design aesthetics.	P/S
16b2	When consumer confidence in product is high, high design aesthetics will lead to lower risk perceptions (b. functional risk) associated with a product than moderate design aesthetics.	N/S
16c1	When consumer confidence in product is high, high design aesthetics will lead to lower financial risk perceptions associated with a product than low design aesthetics.	N/S
16c2	When consumer confidence in product is high, high design aesthetics will lead to lower financial risk perceptions associated with a product than moderate design aesthetics.	N/S
17a	When consumer confidence in product is high, high design aesthetics will lead to higher purchase intentions than low design aesthetic.	N/S
17b	When consumer confidence in product is high, high design aesthetics will lead to higher purchase intentions than moderate design aesthetic	N/S

CHAPTER VI. DISCUSSION

This research had two objectives: 1) the first objective was to investigate whether perceived risks are psychological constructs that mediate the impact of differing levels of design aesthetics on consumer response, i.e., whether perceived risks serve as the underlying psychological explanation for "the aesthetic middle preference" (Giese et al., 2014); 2) the second objective was to examine the moderating effects of individual differences in aesthetic expertise and situational differences in product confidence on the aesthetic middle effect to reveal if the aesthetic middle operates differently for consumers with high versus low aesthetic expertise and when consumers' confidence in the product is high versus low.

Effects of Design Aesthetics on Perceived Risks and Purchase Intentions

Previous research has demonstrated that designs closer to the aesthetic middle are preferred leading to maximal pleasure (Berlyne, 1974; Cox & Cox, 2002; Giese, Malkewitz, Orth, & Henderson, 2014; Hung & Chen, 2012; Kumar & Garg, 2010; Mehrabian & Russell, 1974; Wang, Minor, & Wei, 2011; Wirtz, Mattila, & Tan, 2000). Hypothesis 1 tested the

aesthetic middle principle proposing that products with moderate design qualities lead to higher purchase intentions as compared to products with high or low design qualities. Results confirmed previous findings by revealing a significant direct effect of design aesthetics on purchase intentions, with highest purchase intentions for moderate design aesthetics as compared to low or high design aesthetics. No significant differences in purchase intentions between low and high design aesthetic were found. These results are congruent with Berlyne's findings (1974) explaining the preference for the aesthetic middle on an arousal based account. Thus, this research provides further support for previous findings in demonstrating the importance of the aesthetic middle effect on consumers' approach behavior.

Previous studies did not attempt to test a psychological explanation for the aesthetic middle preference (e.g., Berlyne, 1974; Cox & Cox, 2002; Giese, Malkewitz, Orth, & Henderson, 2014; Mehrabian & Russell, 1974). To fill this gap in the literature, hypotheses 2 and 3 projected that perceived risks can serve as a psychological explanation for the preference of the aesthetic middle, by proposing that moderate design aesthetics will lead to lower perceived risks as compared to low or high design aesthetics. Findings showed that, indeed, lowest risks were perceived for products with a design closest to the aesthetic middle. Moderate design aesthetics led to lowest perceived psycho-social, functional, as well as financial risks as compared to products with low or high design aesthetics. High design aesthetics led to the highest financial risk perceptions. When confronted with a product with high design aesthetics, consumers may perceive a negative attractiveness-bias, such that the offer may be perceived too good to be true or hiding "harm behind its beauty" (Russo & De Moraes, 2003, p.146). This negative attractiveness-bias may eventually result in negative judgments mediated by negative

psychological responses and attributions (Hagtvedt & Patrick, 2014), and avoidance behavior. This current study's results are consistent with previous arguments that high design aesthetics can hurt a product (Hagdvet & Patrick, 2014).

Previous research has also suggested that a complex stimulus can create an uncomfortably high level of uncertainty (Berlyne, 1974; Cox & Cox, 2002). This uncertainty can also be extended to products with low design aesthetics, given that poor design leads to negative consumers' responses (Bloch et al., 2003). Indeed, low design aesthetics led to highest psycho-social and functional risk perceptions. This research showed that products with high and low design aesthetics lead to higher risk perceptions than moderate design aesthetics and subsequently urge consumers to protective actions, such as avoiding and not purchasing the product. Thus, the choice of the middle over alternatives with low or high (i.e., extreme) characteristics can be explained as a risk-alleviating mechanism when confronted with alternative product options.

Influence of Perceived Risks on Purchase Intentions and its Mediating Role

This research proposed that the three dimensions of perceived risks negatively influence purchase intentions. The negative effect of perceived risks on purchase intentions has been verified by a substantial number of previous studies (e.g., Darden & Dorsch, 1990; Eastlick & Feinberg, 1995; Han, 2006; Kim & Lennon, 2000; Kwon, Paek, & Arzeni, 1991), such that when consumers perceive less risk, their intent to purchase increased and vice versa. Results of this study revealed significant influences of all dimensions of perceived risks on purchase intentions, such that higher psycho-social, functional, and financial risk reduced the intention to purchase

and vice versa. Of the three perceived risk dimensions, financial risk had the greatest impact on purchase intentions. Financial risk is related to concerns of not receiving the expected return on an investment or can be related to consumers' insecurities associated with the costs of the product (Dholakia, 2001), which can be experienced at the point of purchase, but also later due to possible repairs, refund, or replacement (Sweeney et al., 1999). This study's results demonstrated that the perceived risk of monetary loss has the greatest impact on consumers' response towards the design of products.

The next most major influence on purchase intentions came from perceived psycho-social risk, which is related to concerns of disapproval of the social environment (i.e., family or friends). The importance of psycho-social risk has been highlighted in previous research, but mainly in context to purchase of symbolic products such as clothing and accessories (Jacoby & Kaplan, 1972). However, this research demonstrated that psycho-social risk also plays a key role for a wider range of products such as home furniture (chairs) when evaluating design aesthetics. These findings highlight that consumers are concerned if their products fit their self-image, whether the fit gains approval of the social environment. The functional risk dimension, which encompasses quality and performance concerns and is associated with poor product performance, had the smallest effect on purchase intention. Interestingly, previous research argued that functional risk is one of the most common types of perceived risk (Grewal, Krishnan, Baker, & Borin, 1998; Liljander et al., 2009), particularly when evaluating design aesthetics. However, according to our results, functional risk has a significant, but the smallest impact on consumers' purchase intentions as compared to financial and psycho-social risks. At the point of purchase, it

seems that consumers' needs regarding financial and psycho-social safety overshadow the functional needs that may be experienced later during product usage (Klerk & Lubbe, 2008).

Previous researchers stated that perceived risks can be seen as a condition arising from stimulus processing, ultimately impacting consumers' purchase intentions (Grønhaug, 1972). Also, Bloch's (1995) model showed that psychological responses to design lead to behavioral responses, such as approach or avoidance. This research tested this assumption by proposing that perceived risks mediate the relationship between design aesthetics and purchase intentions. Even though all dimensions of perceived risks were shown to have a significant influence on consumers' behavior, results demonstrated that the three perceived risks dimensions only partially mediated the effect of design aesthetics on purchase intentions. It is likely that the strong effect of design aesthetics on purchase intentions hinders perceived risks to form a true mediation relationship. However, it can be concluded that perceived risks are the underlying mechanism for the preferred choice for products with designs closer to the aesthetic middle. This unique finding facilitates a better understanding of the relationship between design aesthetics and purchase intentions describing the mechanism by which design aesthetics influences purchase intentions through perceived risks.

Moderating Effects of Aesthetic Expertise

The second objective of this research asked the question whether the aesthetic middle principle operates differently among consumers with low/high aesthetic expertise and low/high product knowledge. Specifically, this objective aimed to examine the moderating effects of

aesthetic expertise and product knowledge on the preference for the aesthetic middle. Hypotheses 6 and 7 proposed that the level of aesthetic expertise moderates the relationship between design aesthetics and risk perceptions and purchase intentions. Results revealed significant interaction effects between design aesthetics and aesthetic expertise on perceived financial risks as well as on purchase intentions, the details of which are discussed in subsequent sections of this chapter. These findings support previous research (e.g., Mitchell, 1995) that showed that people differ in their risk averseness and risk perceptions in decision-making.

The interaction effect of design aesthetics and aesthetic expertise did not reach statistical significance for perceived psycho-social and functional risks. However, this research did not predict for all three conditions of design aesthetics (low, moderate, and high) to show significant differences in purchase intentions and perceived risks for high versus low aesthetic expertise. Rather, this study predicted simple main effects within the two levels of aesthetics expertise. In other words, since the hypotheses 8 - 11 were at a simple main effects level, the analysis of these hypotheses could be conducted and interpreted even though the overarching interaction effect was non-significant for psycho-social and functional risks.

Low Aesthetic Expertise

Hypotheses 8 and 9 predicted that for consumers with low aesthetic expertise, designs with moderate aesthetic qualities that are closer to the aesthetic middle will result in the lowest risk perceptions and highest purchase intentions than those with low or high aesthetic qualities. This proposal was confirmed among those with low aesthetic expertise, and the three dimensions of perceived risks (psychological-social, financial, and functional) were the lowest for chairs with moderate design aesthetics as compared to low and high design aesthetics. However, for

functional risk perceptions, the differences between moderate and high design aesthetics did not reach statistical significance, whereas for financial risk, the differences between moderate and low design aesthetics did not reach statistical significance.

The results further verified that consumers with low design expertise, also demonstrate the highest purchase intentions for moderate design aesthetics as compared to low or high design aesthetics. This supports previous findings that non-experts prefer moderate characteristics over more extreme ones (Berlyne, 1974; Reber et al., 2004). The results also support the Processing Fluency Theory's (Reber et al., 2004) core proposition that the perceiver's aesthetic response to an object depends on the perceiver's fluency of processing indicating that the more easily the perceiver can understand an object and its attributes, the more positive the response and attitude towards the object. Consumers with low design expertise lack the ability and motivation to process complex designs, but have the skills to process moderate and low aesthetic designs leading to fluent processing. Also, these consumers use the design of a product to simplify their decision-making. However, for such consumers the design should not be too simple, as rudimentary designs can result in a lack of stimulation and boredom (Berlyne, 1974).

In addition to the above hypothesized results, the findings revealed a non-hypothesized simple main effect for consumers with low aesthetic expertise. For this group of consumers, high design aesthetics led to the lowest purchase intentions and highest perceived risks. Even though the effect on psycho-social and functional risk did not reach significance, it was in the same direction. This result makes perfect sense since consumers with low aesthetic expertise may not possess the requisite skills, knowledge, and motivation to process and understand high design aesthetics. Hence, non-experts may feel overwhelmed when they encounter products with high

aesthetic qualities (Kumar & Garg, 2010; Rogers & Ventakarman, 1991), and this negative reaction can increase perceived risks and lower purchase intent. Indeed, the current results support previous findings that complex stimuli can create an uncomfortably high level of uncertainty (Berlyne, 1974; Cox & Cox, 2002), which can deteriorate approach behaviors. To summarize, consumers with low aesthetic expertise have the greatest preference for designs with moderate aesthetic qualities followed by simple qualities, with the least preference for high design qualities.

High Aesthetic Expertise

Hypotheses 10 and 11 predicted that for consumers with high aesthetic expertise, lower risk perceptions and greater purchase intentions will result from high design aesthetics as compared to low or moderate. Results from testing these hypotheses were more nuanced and showed that for experts, psycho-social and functional risk perceptions were lower for high as compared to low design aesthetics. Financial risk perceptions were also lower for high designs as compared to low designs, but the difference was not statistically significant. This result was also confirmed with purchase intentions as a dependent variable, such that experts had higher purchase intentions for chairs with high design aesthetics as compared to low design aesthetics. Even though the effect did not reach statistical significance for purchase intentions and financial risk perceptions, the effect was in the proposed direction. These results tentatively confirm previous findings that experts find challenging, complex, and abstract arts more pleasing and interesting (e.g., Silvia & Berg, 2011) than simple alternatives. Indeed, experts consider the aesthetic value, the ideas behind the work, and the norms of 'good' and 'bad' taste (Leder et al.,

2004) and are likely to evaluate simple stimuli more negatively than more complex design disregarding the ease of processing simple designs (Leder et al., 2004).

The current research extends previous findings by revealing that when experts encounter low aesthetic designs, they perceive higher risks due to low arousal and boredom (Berlyne, 1974), suggesting that products with low aesthetics may not function for the functional, self- and social-image needs of experts. Further, experts may feel that products with low design aesthetics can be harmful. For example, purchasing products with low design aesthetics can hurt an aesthetic expert's social status, thus, resulting in higher psycho-social risk perceptions. Moreover, experts may experience a functional risk in acquiring a product with a design that they find less enjoyable than expected (Reber et al., 2004).

The results unexpectedly revealed that like non-experts, experts also perceive risks to be lowest for products with moderate design aesthetics as compared to high and low design aesthetics. In line with this result, they also showed the greatest intentions to purchase chairs with moderate design aesthetics as compared to low or high design aesthetics. This result was contrary to what was predicted in hypothesis 11b and 10a-c.2 and contradicts previous research that has argued that the aesthetic middle effect does not occur for experts (e.g., Giese et al., 2014; Peracchio & Tybout, 1996). Hence, the current study confirms that the preference for the aesthetic middle holds for experts as well as non-experts, and is indeed a fairly robust design principle.

Moderating Effects of Product Confidence

The second objective of this research included examining the moderating effects of situational differences in product confidence on the aesthetic middle effect. Hypotheses 12 and 13 proposed that the level of product confidence moderates the effect of design aesthetics on risk perceptions and purchase intentions. Results revealed significant interaction effects between design aesthetics and product confidence on perceived financial risk as well as on purchase intentions. This result is consistent with previous findings that the level of confidence (Mitchell, 1999) and the availability of product information (Kim & Lennon, 2000) influences consumers' responses including psychological responses (i.e., perceived risks) as well as their behavioral responses (i.e., purchase intentions), such that when product information is available, consumers' purchase intentions increase and perceived risks decrease (Han, 2006).

However, the interaction effect of design aesthetics and product confidence did not reach statistical significance for perceived psycho-social and functional risks. This result is equivalent to results for the moderating role of aesthetic expertise. As explained earlier, the interaction effect was non-significant for two perceived risk levels. However, this study predicted simple main effects for each level of product confidence with the three levels of design aesthetics on the dependent variables. Given that the hypotheses 14 - 17 were at a simple main effects level, the analysis of these hypotheses could be conducted even though the overarching interaction effect was non-significant for the two dimensions of perceived risks (psycho-social and functional risk).

Low Product Confidence

Hypotheses 14 and 15 predicted that when product confidence is low, moderate design aesthetics will lead to lower risk perceptions (psycho-social, functional, and financial) and higher purchase intentions compared to low or high design aesthetics. Supporting this proposal, results demonstrated that the three perceived risk dimensions were lowest for products with moderate design aesthetics. Even though the differences between moderate and high design aesthetics for the functional and financial risk dimensions did not reach statistical significance, the effect was in the predicted direction. Additionally, for low product confidence, moderate design aesthetics led to highest purchase intentions as compared to low or high design aesthetics, which supported the proposed hypotheses. This research confirmed that when consumers are confronted with high or low design aesthetic products with missing product reviews, they feel less knowledgeable and experience a lack of confidence (Ross, 1975) resulting in higher perceived risks and lower intentions to purchase the product. In other words, if no consumer information in form of product reviews is available, consumers are likely to feel less confident in approaching the product, thus rejecting high and low designs and choosing the 'safe' route by approaching the aesthetic middle design. Indeed, choosing the aesthetic middle can help consumers with low product confidence by reducing their perceptions of risk.

Previous studies have also shown that when consumers have suspicions about the product, a trade-off of their needs occurs (Chitturi, et al., 2007). Specifically, they trade-off hedonic for utilitarian needs when uncertainties about functional qualities of the product arise. Our study suggests that consumers may not be willing to completely trade-off on hedonic needs by choosing the lowest design aesthetic, but may be willing to make trade-offs to a certain point

by selecting the aesthetic middle. To summarize, this research demonstrated when product confidence is low, consumers make trade-offs on their hedonic needs by choosing the aesthetic middle. This trade-off and choice for the middle is a consumer's risk reducing strategy (Campbell & Goodstein, 2001).

Additionally, a non-hypothesized simple effect was found, such that high design aesthetics led to significantly higher financial risk and marginally higher psycho-social risk perceptions than low design aesthetics when product confidence was low. This finding makes intuitive sense since consumers, who lack product confidence perceive the highest risk in complex design, and instead choose the aesthetic middle or the simpler version. Interestingly, for functional risk perceptions, the low design aesthetic as compared to the high led to highest risk perceptions. This shows that for consumers with low product confidence the simple design option leads to highest concerns about the product's performance even though it lowers psycho-social and financial risks compared to high design aesthetics.

High Product Confidence

Hypotheses 16 and 17 predicted that when product confidence is high, high design aesthetics compared to middle or low design aesthetics will lead to lower perceived risks and higher intentions to purchase. Supporting this proposal, results demonstrated that psycho-social and functional risks were lower for high design aesthetics as compared to low design aesthetics. Aligned with this, purchase intentions were higher for high design aesthetics as compared to low design aesthetics. Even though the differences between high and low design aesthetics for purchase intentions and psycho-social risks did not reach significance, the effects were in the proposed direction. Previous studies have also shown that the level of confidence varies with the

product information available (Bauer, 1970) and confidence decreases perceived risks (Mitchell, 1999). Our study supports these findings and suggests when product review information is available, consumers feel more knowledgeable, which results in higher confidence in decision-making and decreased perceived risks.

Our study suggests that when product confidence is high, consumers have no need to trade-off hedonic for functional product attributes, rather can choose the product with higher hedonic attributes (e.g., high design aesthetics) without any functionality concerns. Specifically, consumers with high product confidence see a product with high design aesthetics with lower perceived risks and increased approach behavior as compared to a product with low design aesthetics. In the high confidence condition, the results unexpectedly revealed that for low and high design aesthetics financial risk perceptions were almost equal. In line with this, our results showed comparable results in the high aesthetics expertise condition, such that financial risks were almost identical for products with high and low design aesthetics. Our study suggests that consumers with high product confidence or high aesthetic expertise experience similar financial risks for products with low and high design aesthetics. Financial risks were lowest for moderate designs, which will be discussed in the section further below. To summarize, previous aesthetics research has argued that high product styling can damage a product's success (Hagdvet & Patrick, 2014), however, our study revealed when product information in terms of positive product reviews is available, products with high aesthetics are preferred over simple design options and, indeed, can be successful.

In the high product confidence condition, the differences between moderate and high design aesthetics for all dimensions of perceived risks and purchase intentions were significant.

As compared to high design aesthetics, moderate design aesthetics led to lower perceived risks and higher purchase intentions. For the functional risk dimension, the effect did not reach statistical significance, but it was in the same direction. These findings were contrary to the proposed effects, but show that the aesthetic middle in design is also successful in a high product confidence context and not only in a low product confidence context. Our research suggests that in a high product confidence context where consumers have the available product information that allows them to trust high designs qualities, they still choose products with moderate design option over alternatives. Contrary to previous findings (e.g., Giese et al., 2014; Peracchio & Tybout, 1996), this study undoubtedly revealed that the aesthetic middle principle occurs for consumers with low product confidence or low expertise as well as to consumers with high product confidence or high expertise.

Manipulation of Product Confidence and its Relation to Aesthetic Expertise and the Level of Design Aesthetics

Results of the manipulation check revealed that consumers' product confidence is dependent on their expertise level, but also on the product's design aesthetics. Results showed consumer product ratings had a different effect for participants with low versus high aesthetic expertise. For participants with low aesthetic expertise, their product confidence was significantly influenced by consumer product ratings, such that products with high consumer product ratings led to higher product confidence as compared to products with low consumer product ratings. Contrary, the product confidence of high design expertise consumers was not

influences by consumer product ratings, such that no differences in product confidence was found when consumer product ratings were available versus not. These findings suggest that experts are less likely to be influenced by other consumers' product reviews, whereas non-experts are indeed affected by others' product ratings. Supporting previous results, our study shows that the degree of confidence varies with the level of expertise (Mitchell, 1999; Ross, 1975): the more experienced consumers are, the more confidence they possess (Ross, 1975). Results suggest that a high level of expertise leads to greater self-confidence and greater trust in the one's ability for good decision-making, which eventually results in lower risk perceptions.

In addition to consumers' expertise level, product confidence was shown to vary with the product's design aesthetics. Results revealed that consumers' product confidence was influenced by consumer product ratings when evaluating products with high design aesthetics. Consumer product confidence was higher when consumer product ratings were available as compared to when product ratings were not available. Our study suggests when evaluating products with high design aesthetics, consumers' product confidence is influenced by the availability of consumer ratings. Thus, for products with high design aesthetic it is important that others' product ratings are provided allowing consumers to make a confident product decision. On the contrary, consumers' product confidence did not differ when evaluating low and moderate product designs with or without product ratings. This allows drawing the conclusion that when consumers evaluate low and moderate design aesthetics products, their product confidence is not influenced by the availability of others' product ratings. These manipulation check findings are consistent with our hypotheses findings, such that consumers' product ratings can help to increase product confidence and minimize the perceived risks that are initially higher for products with high

design aesthetics. Further, products with moderate design aesthetics inherit lower overall risks and, thus, consumers' product confidence is less influenced by the availability of product review ratings when confronted with products with moderate design aesthetics.

CHAPTER VII. CONCLUSION AND IMPLICATIONS

The research described in the previous chapters offers valuable insights for understanding consumers' psychological responses as well as their approach versus avoidance behaviors in the context of consumer goods with differing levels of design aesthetics (low, moderate, and high). The findings from this study offer important theoretical, methodological, and practical implications that are discussed in subsequent sections.

Theoretical Implications

This study offers multiple theoretical implications originating from the mediating and moderating relationships and constructs examined in this study. First, the theoretical implications regarding the preference for the aesthetic middle and perceived risks as a psychological explanation will be discussed followed by theoretical implications for aesthetic expertise and product confidence as moderators.

Preference for the Aesthetic Middle and its Relation to Perceived Risks

Half a century ago, Einstein suggested to "make things as simple as possible, but not simpler" (Calaprice, 2010, p. 385) and over thousands of years ago, Socrates warned *"*(one) must know how to choose the mean and avoid the extremes on either side, as far as possible". The results of this research demonstrate that Einstein's as well as Socrates' insights are still applicable in today's times, particularly when it comes to the design of consumer products. Fechner (1876), who named this phenomenon *the aesthetic middle*, explained through his research findings that stimuli with moderate aesthetic qualities stimulate more favorable responses than stimuli with extreme design characteristics. The discipline of empirical aesthetics specifically Berlyne (1974) has provided an arousal-based explanation for the aesthetic middle principle, such that moderate levels of stimulus lead to an optimum degree of arousal, and eventually to maximal pleasure (Berlyne, 1974).

Results of this research showed that the arousal-based explanation for the aesthetic middle preference can be extended to a perceived risks-based psychological explanation, which is one of the most significant contributions of this research. Indeed, consumers aim to eliminate or at least to minimize uncertainties and negative consequences in their decision-making to handle the risks. Thus, the choice for the aesthetic middle in product design can be seen as a risk-alleviating mechanism. This theoretical implication for the explanation of the aesthetic middle preference in product design is unique and adds valuable insight for theories in aesthetics. We believe that we are the first to establish a risk-based explanation for the aesthetic middle preference.

According to Leder et al.'s model (2004), aesthetic experience includes five processing stages that provide insight into the processes that occur within the cognitive system of the perceiver when evaluating an aesthetic object. The two outputs of Leder et al.'s model (2004) are aesthetic emotion and aesthetic judgment. Leder et al. (2004) argue that aesthetic judgment results from uncertainty about the object. The present research demonstrated that aesthetic judgment not only results from uncertainties, but also results from perceived risks. Perceived risks are an influential factor in consumers' decision making, thus extending Leder et al.'s (2004) information processing model of aesthetic experience to include this important variable in purchase decisions. Further, only a few studies have mentioned risks in relation to aesthetics (Campbell & Goodstein, 2001; Thurgood, Hekkert, & Blijlevens, 2014; Wilson et al., 1993) and their results did not confirm a significant relationship between design and risks (Thurgood et al., 2014). The current study highlights the importance of perceived risks in decision-making and successfully demonstrates that risks are a perceived outcome variable, an aspect previously unexamined in the literature; thus, the study extends theories in aesthetics. Furthermore, this study emphasizes the mediating role of perceived risks in the relationship between aesthetics and purchase intentions concluding that perceived risks are the underlying mechanism for the aesthetic middle preference in design. This finding is a significant contribution to literature and fills a gap in literature by providing a psychological explanation for the aesthetic middle principle. These important theoretical implications give a better understanding of the relationship between design aesthetics and purchase intentions by describing the process by which design aesthetics influences purchase intentions through perceived risks.

Previous studies exploring the relationship between design and risk defined risk as a one-dimensional factor (Campbell & Goodstein, 2001; Thurgood et al., 2014). In the current study, perceived risk was clearly shown to be a multidimensional variable. Therefore, it is important to consider the different dimensions of perceived risks (psycho-social, functional, and financial risks) and theoretically define and operationalize risk as a multidimensional factor. Out of all risk dimensions, perceived financial risks followed by psycho-social risks were shown to have the biggest impact on consumer behavioral responses. Previous researchers discussed functional risk to be one of the most common types of perceived risk (Grewal, Krishnan, Baker, & Borin, 1998; Liljander et al., 2009) when evaluating design aesthetics. However, our findings show that functional risk has a significant, but the smallest impact on consumers' behavior as compared to financial and psycho-social risks. These findings provide valuable theoretical implications by highlighting consumers' needs regarding financial and psycho-social safety at the point of purchase. It seems that financial and psycho-social safety overshadow the functional needs that may be experienced later during product usage (Klerk & Lubbe, 2008). For this reason, it is important for aesthetic theories to value and further explore consumers' perceived financial and psycho-social risks that arise in consumers' product decision making.

In summary, this research further extends the understanding of the fundamental dimensions of consumer responses (Mehrabian & Russell, 1974) by shedding light on the relationship between aesthetics, perceived risks, and purchase intentions. It confirms that perceived risks are a psychological-based explanation for the aesthetic middle principle thus closing critical gaps in aesthetics literature and providing new insights in the aesthetic theories.

Moderating Influence of Aesthetic Expertise and Product Confidence

Reber et al. (2004) proposed that "beauty is grounded in the processing experience of the perceiver" (p. 364) and this research showed that, indeed, product design judgment varies by the expertise level of the perceiver. Further, according to the Processing Fluency Theory's (Reber et al., 2004) core concept, the ease of processing influences consumer responses, such that the more easily the perceiver can understand an object and its attributes, the more positive the response and attitude towards the object and vice-versa. This research showed that ease of processing is indeed influenced by consumers' expertise level and by the availability of product information, which eventually influence consumer responses to product designs. For this reason, this research supports the core concept of the Processing Fluency Theory (Reber et al., 2004). Further, this research also supports Bloch's model of consumer response (2004), such that individual difference and situational variables are moderators of consumer response to product design. The current study's findings extend Bloch's model by showing that aesthetic expertise is such a moderating individual difference variable whereas product confidence is a moderating contextual variable influencing the relationship between product design and consumer behavior.

Previous research argued that the aesthetic middle effect is not effective for experts (e.g., Giese et al., 2014; Peracchio & Tybout, 1996). However, the current study showed that the effects of the aesthetic middle also apply to experts, such that the preference for the moderate option also occurs for individuals with a high level of aesthetic expertise. Experts, who have the schema to understand high designs qualities, still preferred and chose the moderate option over alternatives. Thus, the findings from this study furnish further support for Berlyne's (1974) theoretical proposal that the aesthetic middle effect applies to a wide range of individuals.

Moreover, previous theories indicated that complex designs can lead to avoidance behaviors (Berlyne, 1974). However, the current research showed that when product information confirming the functionality of the product is available, high design aesthetics indeed can lead to approach behavior.

The findings from this study have implications for aesthetic theories by closing a gap in the literature regarding the role individual difference variables as well as situational variables in the relationships between product, risk perceptions, and purchase intentions. Providing the understanding of the link between these variables is particularly important because of their critical role in consumers' decision-making and responses.

Methodological Implications

Earlier research exploring product aesthetics or product design has defined the variable based on high versus low product aesthetics (Page & Herr, 2002), physical appearance (Forsythe, 1995), overall design (good vs. bad), and emotional aesthetic dimensions (Klerk & Lubbe, 2006). Categorizing product aesthetics as attractive/ non-attractive or likeable/ non-likeable is subjective and may not provide objective implications for product design based on holistic principles of design. Indeed, it is significant to operationalize product aesthetics objectively and holistically. This study uses the construct 'design aesthetics', which is a broader term encompassing product design as a whole as compared to specific design elements or principles such as complexity, typicality, and unity. In this study, design aesthetics is defined as the 'form' of an object or environment (Hagtvedt & Patrick, 2014; Hoegg & Alba, 2008) capturing a design's perceived hedonic tone (Berlyne, 1974) and provides sensory pleasure and stimulation to the viewer

(Bloch, 1995). This study offers methodological implications related to the definition and operationalization of design aesthetics. Instead of measuring several design variables such as complexity, typicality, and unity, this research provided visual and oral descriptions of design aesthetics followed by a 7-point Likert-type scale ranging from low design aesthetics (1) to moderate design aesthetics (4) and high design (7), which was proven to be a reliable and valid measure. Hence, the methodology applied to operationalize design aesthetics offers a valuable alternative to measuring multiple variables.

As indicated previously, some earlier studies defined risk as a one-dimensional factor (e.g., Campbell & Goodstein, 2001; Thurgood et al., 2014). In this study, perceived risk was clearly shown to be a multidimensional variable. Thus, it is important to study the different dimensions and operationalize risk as a multidimensional factor. Additionally, this research showed the functional risk dimension to have the smallest impact out of all dimensions of perceived risks on consumers' behavior response. This contrasts previous research that argued that functional risk is one of the most common types of perceived risk (Grewal, Krishnan, Baker, & Borin, 1998; Liljander et al., 2009). Especially, in an online retailing context, where physical interaction with the product is absent, functional concerns about the online purchase, thus, perceived functional risks, were expected to have a stronger influence on consumer response. However, this research showed that financial as well as psycho-social risks have the greatest impact on consumers' behavior. This insight has implications for future research in rethinking the importance of the individual risk dimensions.

This study offers methodological implications for the manipulation of consumers' confidence with a product. Product confidence was manipulated through the availability of

consumer star product ratings displayed next to the product. Unavailability of consumer star ratings resulted in low product confidence, whereas five consumer star ratings led to high product confidence. Further, this study offers methodological implications related to the development of an adapted measure of product confidence. Product confidence was operationalized measuring product confidence from product review information. Results allowed to shorten the scale from five to three items and confirmed the reliability and validity. One example item was "Based on the product reviews, I am confident in my choice of this product." This generalized operationalization allows other researchers to apply it to measuring product confidence for a wide range of products.

Regarding aesthetic expertise, this research provides methodical implications in recruiting groups with distinct levels of expertise in aesthetics, art, and design. Several layers of recruitment stages allowed ensuring a successful differentiation in participants' individual differences. First, differentiating consumers based on their interests in arts and their hobbies in relation to art and design allowed the screening of participants and building of two groups. Next, implementing the CVPA scale established by Bloch et al. (2003) was shown to be one successful way of differentiating between low and high aesthetic expertise. Further, in this study a five items aesthetic expertise scale to measure participants' aesthetic expertise was developed. The measure followed Smith and Smith's (2006) approach to measuring aesthetic fluency and later was adapted by Silvia and Berg (2011). Their research measured expertise in film. The present research adapted the measure of Silvia and Berg (2011) to measure expertise in arts and design. These methodical implications for aesthetic expertise measurement can inform future studies in this area.

Another implication for methodology is in relation to increasing the validity and reliability of responses. Ensuring precise and faithful participant responses can increase the validity and reliability of the research. For this reason, several screening-out questions were implemented in the research questionnaire. For example, participants would randomly be confronted with a measure such as "For this question, please select the scale point 3 (neutral)". This allowed ensuring that participants' attention was high when answering the questionnaire and ensured that participants did not randomly select any answer. Another methodological implementation for future studies implementing online experiments is to apply a given exposure time to the stimuli. The current study was conducted as an online experiment, where the completion process was not completely self-paced and the exposure time to the stimuli for each participant was controlled. A minimum stimulus exposure time of five seconds was implemented, such that an uncontrolled exposure time could not influence participants' evaluation processes.

Practical Implications

This research provides empirical verification that product marketers and retailers operating within a marketplace with a diverse group of consumers can benefit substantially by tailoring the design level of their products and displaying the product information consumers need to make a confident product decision. Apart from marketers and retailers, this study offers important implications for professionals and educators. Educators in marketing and product development could use teaching strategies helping students in learning about the aesthetic middle

and identifying its powerful influence. Next, in developing products and brands, the aesthetic middle in design as well as its influence can be crucial to understand for a company to succeed.

Clearly, this research showed that the individual's risk perceptions influence the behavioral responses. For practitioners, understanding consumers' risk perceptions in relation to a product's design is very helpful when making product design-based market segmentation, targeting, and positioning decisions. As indicated, designers often use extreme design characteristics to gain consumer attention, such that products are often overstyled (Rawsthorn, 2009). However, this research demonstrates the power of designs that are close to the aesthetic middle and highlights the value of moderate aesthetic qualities over alternatives. Findings from this study reveal that companies introducing new products to a general market may be more successful applying designs close to the aesthetic middle, thus stimulating greater new product adoption among general consumers. Designs closer to the aesthetic middle help consumers to eliminate uncertainties that come with new or unfamiliar products and can help consumers to avoid any negative consequences. Products with a moderate design help to minimize the risks that come with a new product and allow consumers to successfully 'handle' the risk. In summary, understanding the level of design aesthetics to the success of new as well as existing brands and products is important because high design aesthetic products may prosper when positioned for consumers with advanced aesthetic expertise, but can fail with consumers who have limited expertise with aesthetic appreciation. Findings of this research can allow product, retail, and brand managers to appropriately tailor the level of design of their product offering and brand advertisement.

Previous research that studied aesthetics argued that high product styling can damage a product's success (e.g., Hagdvet & Patrick, 2014). However, the current research provides the understanding that when product information positively confirming the product function is available, high aesthetics indeed can be successful. This study helps to determine the type of product information needed for differing levels of design for the product to be successful in alleviating perceived risks related to the product. For example, for products with high design aesthetics, it is important that the product is displayed with product information that helps to increase consumers' product confidence. Consumer product ratings can allow consumers to make a confident product decision. Contrary to this, for products with moderate or low design aesthetics the availability of product information is less important.

In addition to tailoring the product information level to the design of the product, this study also helps to determine the most successful levels of product design for distinct types of consumers. In order to alleviate perceived risks related to the product, this research showed that consumers with high expertise prefer products with moderate and high designs to low designs. However, if products with high design are offered, product information is needed. Consumers with low design expertise prefer products with a moderate to low design over high designed products. Based on these findings, this study offers important implications for marketers and retailers in the context of their target market. For example, if the company's target market includes mainly innovators and early adopters of fashion (Rogers, 1983), a product with moderate to high design may be most successful. In contrast, for a target market including late adopters and laggards (Rogers, 1983), products with a moderate to low design aesthetics may be most successful. Introducing a product with high design in such a market may lead to product

failure. To summarize, findings from this study revealed the insight for companies introducing new products to a general and undifferentiated market may be more successful applying designs closer to the aesthetic middle, thus stimulating greater new product adoption among consumers.

Another important practical implication is to highlight consumers' financial concerns that have a strong influence on their product response behavior. This research showed that out of all studied risk perceptions, financial and psycho-social risks had the greatest impact on the behavioral response. These findings may be relevant to marketers, such that the research insights give input for different strategies to minimize the influence of these risk dimensions. For example, marketers could highlight the financial safety of a purchase when advertising the products. Or marketers could advertise the product in a way of showing how well accepted the product is by the social environment.

Limitations and Recommendations for Future Research

Despite efforts to ensure the validity of the results, this study has some limitations due to methodological issues. The experiment used only one product category, chairs. For this reason, the ability to generalize the findings to other product categories is limited. Future studies could test the aesthetic middle effect for a wider range of products, leasing to more generalization of the findings. Another limitation of this study is that product images in an online retailing context were used to test the proposed hypotheses. Being confronted with actual products in a store may influence consumers' risk perceptions differently. For example, it is possible that the financial perceived risk dimension had such a strong influence because the product was presented in an online retailing context, such that participants of this study were influenced by financial concerns

about the online purchase. For this reason, future studies should be conducted in a retailing store setting with actual products to be purchased. Such a setting could potentially allow measuring actual purchase rather than the purchasing intention. This study only measured purchase intention rather than actual purchases, although purchase intention has been shown to be a true indicator of consumers' future purchase (Ajzen, 1988).

This research demonstrated that individual difference variables such as aesthetic expertise significantly influenced the effect of design aesthetics on consumers' responses and behaviors. Thus, it is likely that other individual difference variables influence this relationship, too. Future research is required to thoroughly investigate the interaction effects of individual difference variables including demographic variables. The results of this research showed that, indeed, age had a significant interaction effect with design, which needs further exploration. Due to the significant effect of design and age, this study implemented a post-hoc blocking strategy introducing age as blocking factors in the analysis. This allowed gaining extra power in the results. When interpreting the results of this study, it is important to note that the observed effects were found after controlling for error associated with age. Further, this study's participants were all female U.S. residents. Given that effects of individual difference variables were found, it is important to use a more diverse sample with a greater variety of participants. Hence, another limitation of this study includes the limited demographics of participants. For example, future studies could explore if the aesthetic middle effect operates similarly for male participants.

Results from this study confirmed that perceived risk is a multidimensional variable. However, based on each item's factor loadings, the three proposed perceived risks dimensions

were not supported for each stimulus. Results indicated, that the items loading differed for each stimulus. It appeared that the loading depended on the stimulus design aesthetic level, such that factors loaded differently for low versus moderate versus high design aesthetics. Due to the inconsistent loading on the three factors, the previously conceptual identified factors were kept and further analyses were continued based on the conceptually defined three perceived risks dimensions. However, using the previously defined factors led to multicollinearity complications, which needed to be controlled for. More insight is needed to fully understand the different dimensions of perceived risks. Future research should carefully reconsider the scale items ensuring that multicollinearity is reduced. Thus, future studies could focus on exploring the different facets of consumers' risk perceptions.

REFERENCES

Alba, J. W., & Hutchinson, J. W. (1987). Dimensions of consumer expertise. *Journal of Consumer Research*, *13*(4), 411–454.

Arnheim, R. (1985). The other Gustav Theodor Fechner. In S. Koch & D. E. Leary (Eds.), *A century of psychology as science* (pp. 856–865). Washington, DC: American Psychological Association.

Bearden, W. O., Netemeyer, R. G., & Haws, K. L. (Eds.). (2010). *Handbook of marketing scales: Multi-item measures for marketing and consumer behavior research* (3rd ed.). Los Angeles, CA: SAGE Publications, Inc.

Beauvois, M. W. (2007). Quantifying aesthetic preference and perceived complexity for fractal melodies. *Music Perception: An Interdisciplinary Journal*, *24*(3), 247–264.

Berlyne, D. E. (1974). *Studies in the new experimental aesthetics: steps toward an objective psychology of aesthetic appreciation*. Washington; DC: Hemisphere Publishing Corporation.

Bettman, J. R. (1973). Perceived risk and its components: A model and empirical test. *Journal of Marketing Research (JMR)*, *10*(2), 184–190.

Bloch, P. H. (1995). Seeking the ideal form: Product design and consumer response. *Journal of Marketing*, *59*(3), 16.

Bloch, P. H., Brunel, F. F., & Arnold, T. J. (2003). Individual differences in the centrality of visual product aesthetics: Concept and measurement. *Journal of Consumer Research*, *29*(4), 551–565.

Calaprice, A. (2010). *The ultimate quotable Einstein*. Princeton, NJ: Princeton University Press.

Campbell, M. C., & Goodstein, R. C. (2001). The moderating effect of perceived risk on consumers' evaluations of product incongruity: Preference for the norm. *Journal of Consumer Research*, *28*(3), 439–449.

Chitturi, R., Raghunathan, R., & Mahajan, V. (2007). Form versus function: How the intensities of specific emotions evoked in functional versus hedonic trade-offs mediate product preferences. *Journal of Marketing Research*, *44*(4), 702–714.

Churchill, G. A. (1979). A paradigm for developing better measures of marketing constructs. *Journal of Marketing Research, 16*(1), 64–73.

Cox, D., & Cox, A. D. (2002). Beyond first impressions: The effects of repeated exposure on consumer liking of visually complex and simple product designs. *Journal of the Academy of Marketing Science*, *30*(2), 119–130.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*, 297–334.

Dahl, D. W., Manchanda, R. V., & Argo, J. J. (2001). Embarrassment in consumer purchase: The roles of social presence and purchase familiarity. *Journal of Consumer Research*, *28*(3), 473–481.

Deering, B. J., & Jacoby, J. (1972). Risk enhancement and risk reduction as strategies for handling perceived risk. *Proceedings of the Third Annual Conference of the Association for Consumer Research*.

Dholakia, U. M. (2001). A motivational process model of product involvement and consumer risk perception. *European Journal of Marketing*, *35*(11/12), 1340–1360.

Dowling, G. R. (1986). Perceived risk: The concept and its measurement. *Psychology & Marketing*, *3*(3), 193–210.

Dowling, G. R., & Staelin, R. (1994). A model of perceived risk and intended risk-handling activity. *Journal of Consumer Research*, *21*(1), 119–134.

Engel, J. F., Kollat, D. T., & Blackwell, R. D. (1973). *Consumer behavior*. New York, NY: Holt, Rinehart and Winston.

Fechner, G. T. (1876). *Vorschule der aesthetik*. Leipzig, Germany.

Fiell, C., & Fiell, P. (1997). *1000 chairs*. New York, NY: Taschen.

Fu, F. Q., & Elliott, M. T. (2013). The moderating effect of perceived product innovativeness and product knowledge on new product adoption: An integrated model. *Journal of Marketing Theory & Practice*, *21*(3), 257–272.

Giese, J. L., Malkewitz, K., Orth, U. R., & Henderson, P. W. (2014). Advancing the aesthetic middle principle: Trade-offs in design attractiveness and strength. *Journal of Business Research*, *67*(6), 1154–1161.

Grewal, D., Krishnan, R., Baker, J., & Borin, N. (1998). The effect of store name, brand name and price discounts on consumers' evaluations and purchase intentions. *Journal of Retailing*, *74*(3), 331–352.

Grønhaug, K. (1972). Risk indicators, perceived risk and consumer's choice of information sources. *Swedish Journal of Economics*, *74*(2), 246.

Ha, S., & Lennon, S. J. (2006). Purchase intent for fashion counterfeit products: Ethical ideologies, ethical judgments, and perceived risks. *Clothing & Textiles Research Journal*, *24*(4), 297–315.

Hagtvedt, H., & Patrick, V. M. (2009). Aesthetics and consumption. [Abstract]. Roundtable Proposal for ACR 2008.

Hagtvedt, H., & Patrick, V. M. (2014). Consumer response to overstyling: Balancing aesthetics and functionality in product design. *Psychology & Marketing*, *31*(7), 518–525.

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York, NY: Guilford.

Hekkert, P., Snelders, D., & van Wieringen, P. C. W. (2003). "Most advanced, yet acceptable": Typicality and novelty as joint predictors of aesthetic preference in industrial design. *British Journal of Psychology*, *94*(1), 111.

Hirsch, R. D., Dornoff, R. S., & Kernan, J. B. (1972). Perceived risk and store selection. *Journal of Marketing Research, 9*,434–443.

Hintze, A., Olson, R. S., Adami, C., & Hertwig, R. (2015). Risk sensivity as an evolutionary adaption. *Scientific reports, 5*(8242), 1–7.

Hoegg, J., & Alba, J. W. (2008). *A role for aesthetics in consumer psychology*. Handbook of Consumer Psychology (pp. 733-754). New York, NY: Erlbaum.

Hong, I. B. (2015). Understanding the consumer's online merchant selection process: The roles of product involvement, perceived risk, and trust expectation. *International Journal of Information Management*, *35*(3), 322–336.

Hung, W.-K., & Chen, L.-L. (2012). Effects of novelty and its dimensions on aesthetic preference in product design. *International Journal of Design*, *6*(2), 81-90.

Jacoby, J., Kaplan, L. (1972). The Components of Perceived Risk, in: Venkatesan, M. (ed.), Proceedings of the Third Annual Conference, *Association for Consumer Research,* 382–393.

Kahneman, D. (2011). *Thinking, fast and slow*. New York, NY: Farrar: Straus and Giroux.

Kim, M., & Lennon, S. J. (2000). Television shopping for apparel in the United States: Effects of perceived amount of information on perceived risks and purchase intentions. *Family and Consumer Sciences Research Journal*, *28*(3), 301–330.

Kumar, M., & Garg, N. (2010). Aesthetic principles and cognitive emotion appraisals: How much of the beauty lies in the eye of the beholder? *Journal of Consumer Psychology*, *20*(4), 485–494.

Landwehr, J. R., Wentzel, D., & Herrmann, A. (2010). Brand strength meets product design: the interactive interplay of two core marketing-mix components. Presented at the 6th International Thought Leaders in Brand Management Conference, Lugano: USI Università della Svizzera italiana.

Leder, H., Belke, B., Oeberst, A., & Augustin, D. (2004). A model of aesthetic appreciation and aesthetic judgments. *British Journal of Psychology*, *95*(4), 489–508.

Liljander, V., Polsa, P., & van Riel, A. (2009). Modelling consumer responses to an apparel store brand: Store image as a risk reducer. *Journal of Retailing and Consumer Services*, *16*(4), 281–290.

Mehrabian, A., & Russell, J. A. (1974). *An Approach to Environmental Psychology*. Cambridge, MA: MIT Press.

Meyers-Levy, J., & Malaviya, P. (1999). Consumers' processing of persuasive advertisements: An integrative framework of persuasion theories. *Journal of Marketing*, *63*(4), 45–60.

Mitchell, V.-W. (1995). Organizational risk perception and reduction: A literature review. *British Journal of Management*, *6*(2), 115.

Mitchell, V.-W. (1999). Consumer perceived risk: Conceptualisations and models. *European Journal of Marketing*, *33*(1/2), 6–195.

Mitchell, V.-W., & McGoldrick, P. J. (1996). Consumers' risk-reduction strategies: a review and synthesis. *International Review of Retail, Distribution & Consumer Research*, *6*(1), 1.

Nohl, W. (2001). Sustainable landscape use and aesthetic perception–preliminary reflections on future landscape aesthetics. *Landscape and Urban Planning*, *54*(1–4), 223–237.

O'Cass, A. (2004). Fashion clothing consumption: Antecedents and consequences of fashion clothing involvement. *European Journal of Marketing*, *38*(7), 869–882.

Ohanian, R. (1990). Construction and validation of a scale to measure celebrity endorsers' perceived expertise, trustworthiness, and attractiveness. *Journal of Advertising*, *19*(3), 39–52.

Page, C., & Herr, P. M. (2002). An investigation of the processes by which product design and brand strength interact to determine initial affect and quality judgments. *Journal of Consumer Psychology*, *12*(2), 133–147.

Paridon, T. J. (2006). Extending and clarifying causal relationships in research involving personal shopping value, consumer self-confidence, and word of mouth communication. *Marketing Management Journal*, *16*(1), 32–43.

Patrick, V., & Hagdtvedt, H. (2011). Aesthetics incongruity resolution. *Journal of Marketing Research, 48,* 393 – 402.

Peracchio, L. A., & Tybout, A. M. (1996). The moderating role of prior knowledge in schema-based product evaluation. *Journal of Consumer Research*, *23*(3), 177–192.

Petty, R. E., Cacioppo, J. T., & Schumann, D. (1983). Central and peripheral routes to advertising effectiveness: The moderating role of involvement. *Journal of Consumer Research*, *10*(2), 135–146.

Rao, A. R., & Sieben, W. A. (1992). The effect of prior knowledge on price acceptability and the type of information examined. *Journal of Consumer Research, 19*, 256–270.

Rawsthorn, A. (2007, April 6). Why the overwhelming numbers of design flops? *The New York Times*. Retrieved from http://www.nytimes.com/2007/04/06/style/06iht-design9.html

Rawsthorn, A. (2009, August 23). British Design: Not What It Used to Be. *The New York Times*. Retrieved from http://www.nytimes.com/2009/08/24/fashion/24iht-design24.html

Reber, R., Schwarz, N., & Winkielman, P. (2004). Processing fluency and aesthetic pleasure: Is beauty in the perceiver's processing experience? *Personality and Social Psychology Review*, *8*(4), 364–382.

Robertson, M., & Walter, G. (2013). *Ethics and Mental Health: The Patient, Profession and Community*. Boca Raton, FL: CRC Press.

Rogers, E. M. (1983). *Diffusion of innovations*. New York, NY: Free Press.

Ross, I. (1975). Perceived risk and consumer behavior: a critical review. *Advances in Consumer Research*, *2*, 1–20.

Saunders, M. N. K., Lewis, P., & Thornhill, A. (2012). *Research methods for business students*. New York, NY: Pearson Education Limited.

Silvia, P., & Berg, C. (2011). Finding movies interesting: How appraisals and expertise influence the aesthetic experience of film. *Empirical Studies of the Arts*, *29*(1), 73–88.

Silvia, P. J. (2013). Interested experts, confused novices: Art expertise and the knowledge emotions. *Empirical Studies of the Arts*, *31*(1), 107–115.

Silvia, P. J., & Barona, C. M. (2009). Do people prefer curved objects? Angularity, expertise, and aesthetic preference. *Empirical Studies of the Arts*, *27*(1), 25–42.

Simonton, D. K. (1990). Lexical choices and aesthetic success: A computer content analysis of 154 Shakespeare sonnets. *Computers and the Humanities*, *24*(4), 251–264.

Statistics on the purchasing power of women. (2017). Retrieved from https://girlpowermarketing.com/statistics-purchasing-power-women/

Sweeney, J. C., Soutar, G. N., & Johnson, L. W. (1999). The role of perceived risk in the quality-value relationship: A study in a retail environment. *Journal of Retailing*, *75*(1), 77–105.

The Value of Design - Design Management Institute. (n.d.). Retrieved January 9, 2017, from http://www.dmi.org/?DesignValue

Wang, Y. J., Minor, M., & Wei, J. (2011). Aesthetics and the online shopping environment: Understanding consumer responses. *Journal of Retailing*, *87*(1), 46 – 58.

Wilson, T. D., Lisle, D. J., Schooler, J. W., Hodges, S. D., Klaaren, K. J., & LaFleur, S. J. (1993). Introspecting about reasons can reduce post-choice satisfaction. *Personality and Social Psychology Bulletin*, *19*(3), 331–339.

Wirtz, J., Mattila, A. S., & Tan, R. L. P. (2000). The moderating role of target-arousal on the impact of affect on satisfaction - an examination in the context of service experiences. *Journal of Retailing*, *76*(3), 347–365.

Zaichkowsky, J. L. (1985). Measuring the involvement construct. *Journal of Consumer Research*, *12*(3), 341–352.

APPENDICES

Appendix A

Add this approval information in sentence form to your electronic information letter!

The Auburn University Institutional Review Board has approved this Document for use from 09/14/2017 to 09/13/2020
Protocol # 17-357 EX 1709

DEPARTMENT OF CONSUMER AND DESIGN SCIENCES

AUBURN UNIVERSITY
COLLEGE OF HUMAN SCIENCES

(NOTE: DO NOT AGREE TO PARTICIPATE UNLESS IRB APPROVAL INFORMATION WITH CURRENT DATES HAS BEEN ADDED TO THIS DOCUMENT.)

INFORMATION LETTER for a Research Study entitled

" Exploring consumer responses to product design"

You are invited to participate in a research study to investigate consumers' responses to product design and its environment. The study is being conducted by Alina Braun, a doctoral candidate, under the direction of Dr. Veena Chattaraman in the Auburn University Department of Consumer and Design Sciences. You are invited to participate because you are a female Professor or a female graduate student in the Department of Consumer and Design Sciences with product design expertise.

What will be involved if you participate? Your participation is completely voluntary. If you decide to participate in this research study, you will be asked to complete an online questionnaire. Your total time commitment will be approximately 15 minutes.

Are there any risks or discomforts? We assure that the participation in this study would put you in no physical or psychological risks other than the minimal inconvenience of completing the questionnaire.

Are there any benefits to yourself or others? The general population may benefit from this study as product designers and marketers may sell and advertise products that better resonates with their target market.

308 SPIDLE HALL, AUBURN, AL 36849-5601; TELEPHONE: 334-844-4084; FAX: 334-844-1340

If you change your mind about participating, you can withdraw at any time by closing your browser window. If you choose to withdraw, your data can be withdrawn as long as it is identifiable. Once you've submitted anonymous data, it cannot be withdrawn since it will be unidentifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Auburn University, the Department of Consumer and Design Sciences.

Any data obtained in connection with this study will remain anonymous. We will protect your privacy and the data you provide by not collecting IP addresses from research participants. Information collected through your participation may be published in a professional journal, and/or presented at a professional meeting.

If you have any questions about this study, please contact Alina Braun amb0042@auburn.edu or Dr. Veena Chattaraman at vzc0001@auburn.edu.

If you have questions about your rights as a research participant, you may contact the Auburn University Office of Research Compliance or the Institutional Review Board by phone (334) 844-5966 or e-mail at IRBadmin@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION ABOVE, YOU MUST DECIDE IF YOU WANT TO PARTICIPATE IN THIS RESEARCH PROJECT. IF YOU DECIDE TO PARTICIPATE, PLEASE CLICK ON THE LINK BELOW. YOU MAY PRINT A COPY OF THIS LETTER TO KEEP.

Alina Braun _____

Investigator Date

Dr. Veena Chattaraman _____

Co-Investigator Date

The Auburn University Institutional Review Board has approved this document for use from _____ to _____. Protocol #_____.

LINK TO SURVEY

308 SPIDLE HALL, AUBURN, AL 36849-5601; TELEPHONE: 334-844-4084; FAX: 334-844-1340
WWW.AUBURN.EDU

The Auburn University Institutional Review Board has approved this Document for use from 09/14/2017 to 09/13/2020 Protocol # 17-357 EX 1709

Add this approval information in sentence form to your electronic information letter!

Appendix B

Pretest 1

Directions:

Here are some examples of products with high design. These designs are beautiful, provide sensory pleasure, have a 'wow-factor' and are emotional.

Please have a close look at these pictures.

Here are some examples of products with low design. These designs lack in regard to beauty, sensory pleasure, and have no 'wow-factor'.

Please have a close look at these pictures.

Appendix B (continued)

Based on the previous description of high and low design, how would you classify the above product on the continuum from low to high design?

Low Design			Neutral			High Design
1	2	3	4	5	6	7

_____ page break _____

Based on the previous description of high and low design, how would you classify the above product on the continuum from low to high design?

Low Design			Neutral			High Design
1	2	3	4	5	6	7

Appendix B (continued)

Based on the previous description of high and low design, how would you classify the above product on the continuum from low to high design?

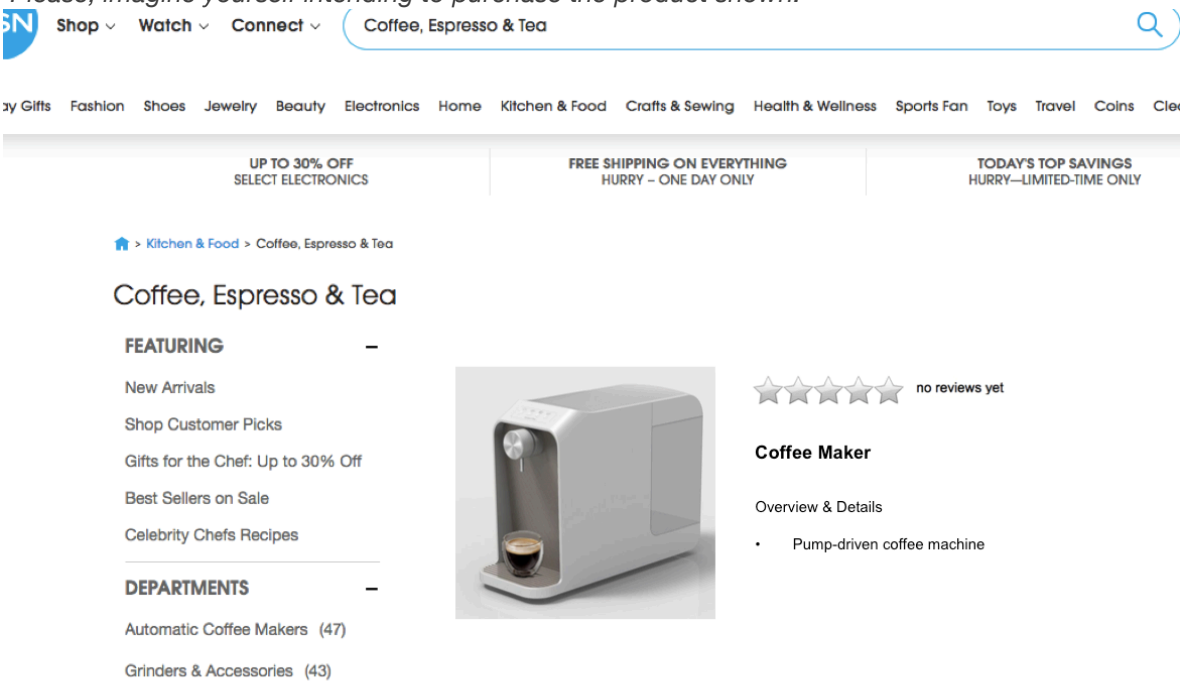
Low Design			Neutral			High Design
1	2	3	4	5	6	7

Appendix C

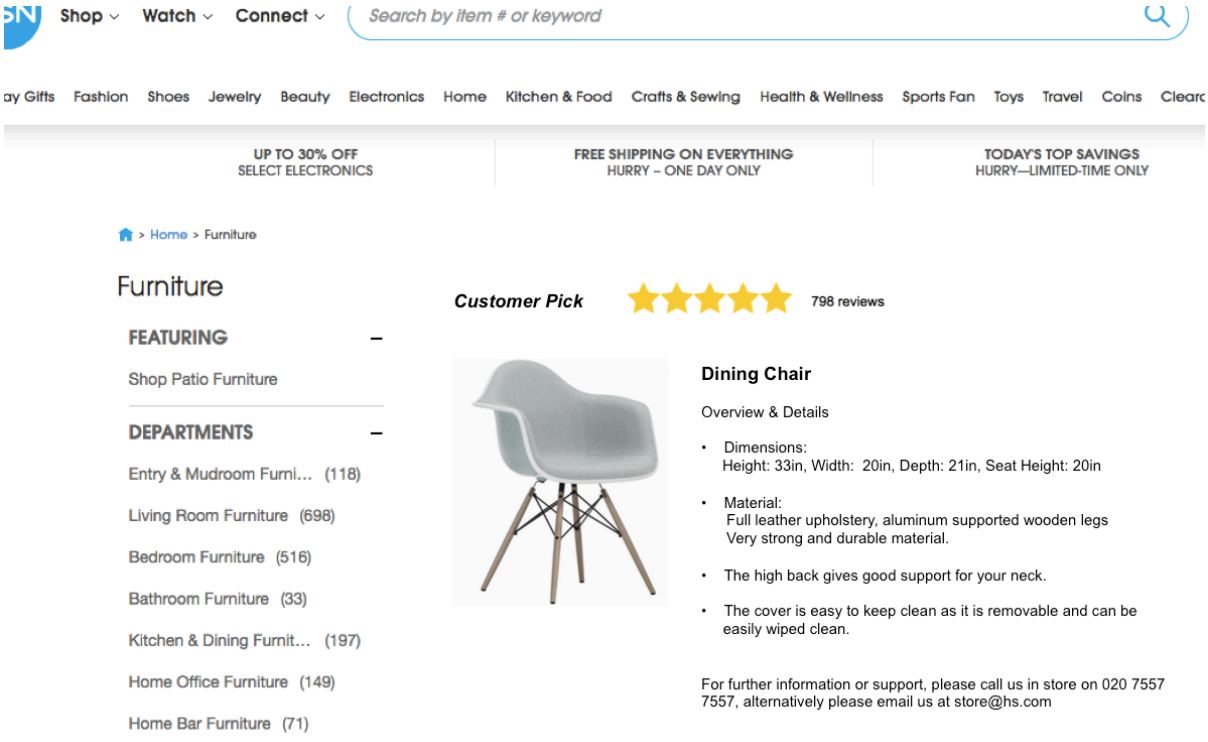
Pretest 2

TASK 1:

On the next pages, you will see two screenshots of an online shop showing products with product ratings by other customers.
Please, imagine yourself intending to purchase the product shown.



	Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
a) I am confident that this product will perform well.	○	○	○	○	○	○	○
b) I am confident in my choice of this product.	○	○	○	○	○	○	○
c) I am confident to make an informed purchase decision.	○	○	○	○	○	○	○
d) I am confident that this product is what I am looking for.	○	○	○	○	○	○	○
e) I am confident that there is nothing wrong with this product.	○	○	○	○	○	○	○



Imagine yourself intending to purchase the product above and indicate how you feel:

	Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
a) I am confident that this product will perform well.	○	○	○	○	○	○	○
b) I am confident in my choice of this product.	○	○	○	○	○	○	○
c) I am confident to make an informed purchase decision.	○	○	○	○	○	○	○
d) I am confident that this product is what I am looking for.	○	○	○	○	○	○	○
e) I am confident that there is nothing wrong with this product.	○	○	○	○	○	○	○

_____page break _____

Appendix C (continued)

TASK 2:

On the next pages, you will be asked to rate different product designs.
First, you will see product examples with high versus low design.

Here are some examples of products with high design. These designs are beautiful, provide sensory pleasure, have a 'wow-factor' and are emotional.

Please have a close look at these pictures.

Here are some examples of products with low design. These designs lack in regard to beauty, sensory pleasure, and have no 'wow-factor'.

Please have a close look at these pictures.

_____ page break _____

Based on the previous descriptions of design, how would you categorize the product above?

- ○ Low Design
- ○ Moderate Design
- ○ High Design

_____ page break _____

Based on the previous descriptions of design, how would you categorize the product above?

- ○ Low Design
- ○ Moderate Design
- ○ High Design

_____ page break _____

Thanks. That was great!

Based on the previous descriptions of ***high versus low designs****,*
in the pages that follow,
you will be asked to rate 36 different products on a continuum from low to high design.

Appendix C (continued)

Low Design			Neutral			High Design
1	2	3	4	5	6	7
○	○	○	○	○	○	○

_____ page break _____

(35 products to rate followed)

_____ page break _____

TASK 3:

*Please indicate how knowledgeable you felt rating the **design** of the products seen on previous pages.*

I felt the following while rating the product designs on previous pages:

a) unknowledgeable	○ ○ ○ ○ ○	knowledgeable
b) unqualified	○ ○ ○ ○ ○	qualified
c) not an expert	○ ○ ○ ○ ○	an expert

Thank you so much for rating the products.

LAST TASK:

*The following set of statements relates to **your demographics.** Please **choose** the answer that best matches your response.*

Do you have an education, interest, or occupation in the field of arts, product design, and/or design in general?

- ○ Yes
- ○ No
- ○ I do not know

What is your age range?

- ○ 20 - 29
- ○ 30 - 39
- ○ 40 - 49
- ○ 50 - 59
- ○ 60 - 69
- ○ 70 or older

Which of the following ethnic groups of the following do you consider to be a member of?

- ○ Non-Hispanic Black (African American)
- ○ Non-Hispanic White (Caucasian American)
- ○ Hispanic
- ○ Asian/Pacific Islander
- ○ American Indian/Alaskan Native
- ○ Other (Please list in the space provided)

What is your household income?

- ○ <$15.000
- ○ $15.000 – $24.999
- ○ $25.000 – $34.999
- ○ $35.000 – $49.999
- ○ $50.000 - $74.999
- ○ $75.000 – $99.999
- ○ $100.000 +
- ○ Would rather not say

How can your occupancy be categorized?

- ○ Homemaker
- ○ Professional
- ○ Retired
- ○ Service Worker
- ○ Skilled Labor
- ○ Student
- ○ Other

What is your level of education?

- ☐ No High School Diploma
- ☐ High School Diploma
- ☐ Some College
- ☐ Associate Degree
- ☐ Bachelor's Degree
- ☐ Master's Degree
- ☐ Doctorate
- ☐ Other (Please list in the space provided)

Appendix C (continued)

In which U.S. region do you currently live?

- ○ Northeast
- ○ Midwest
- ○ South
- ○ West
- ○ Other (specify)

Appendix D

Main Study

TASK 1 out of 4
INSTRUCTIONS:

On the next pages, you will see product examples with high versus low design.

Please have a very close look at these designs for a few seconds. Then you can click to continue.

_____ page break _____

HIGH DESIGN

First you see examples of high design.
These designs are beautiful, provide sensory pleasure, and have a 'wow-factor'

Please have a close look at these pictures.

_____ page break _____

Appendix D (continued)

LOW DESIGN

Here are some examples of products with low design. These designs lack in regard to beauty, sensory pleasure, and have no 'wow-factor'.

Please have a close look at these pictures.

_____ page break _____

Based on the previous descriptions of design, how would you categorize the product above?

- ○ Low Design
- ○ Moderate Design
- ○ High Design

_____ page break _____

Based on the previous descriptions of design, how would you categorize the product above?

- ○ Low Design
- ○ Moderate Design
- ○ High Design

_____ page break _____

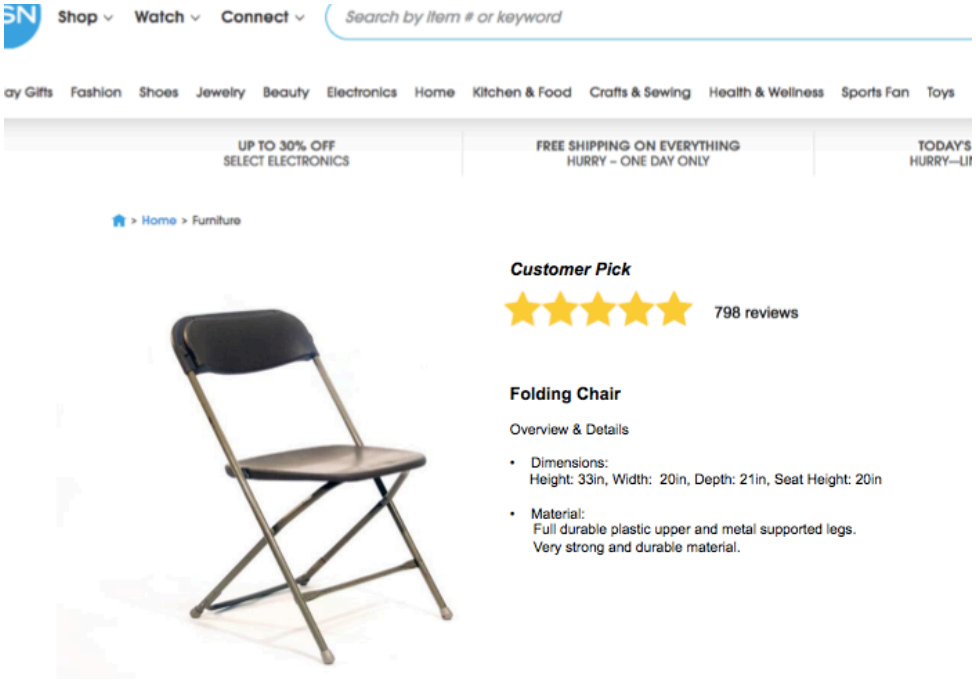
TASK 2 out of 4
INSTRUCTIONS:

On the next pages, first, you will see a screenshot of an online shop.
Please, imagine yourself intending to purchase the product shown.

After a few seconds, you will automatically transition to the next page where you will have an opportunity to indicate your agreement with the statements that follow.

You will first view and then rate six products in total.

_____ page break _____



Imagine yourself intending to purchase the product above and indicate how you feel:

	Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
a) I would consider buying this product.	○	○	○	○	○	○	○
b) I would purchase this product.	○	○	○	○	○	○	○
c) There is a strong likelihood that I would buy this product.	○	○	○	○	○	○	○

	Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
a) The construction quality will be poor.	○	○	○	○	○	○	○
b) The product will not be durable.	○	○	○	○	○	○	○
c) There will be something wrong with the product purchased.	○	○	○	○	○	○	○

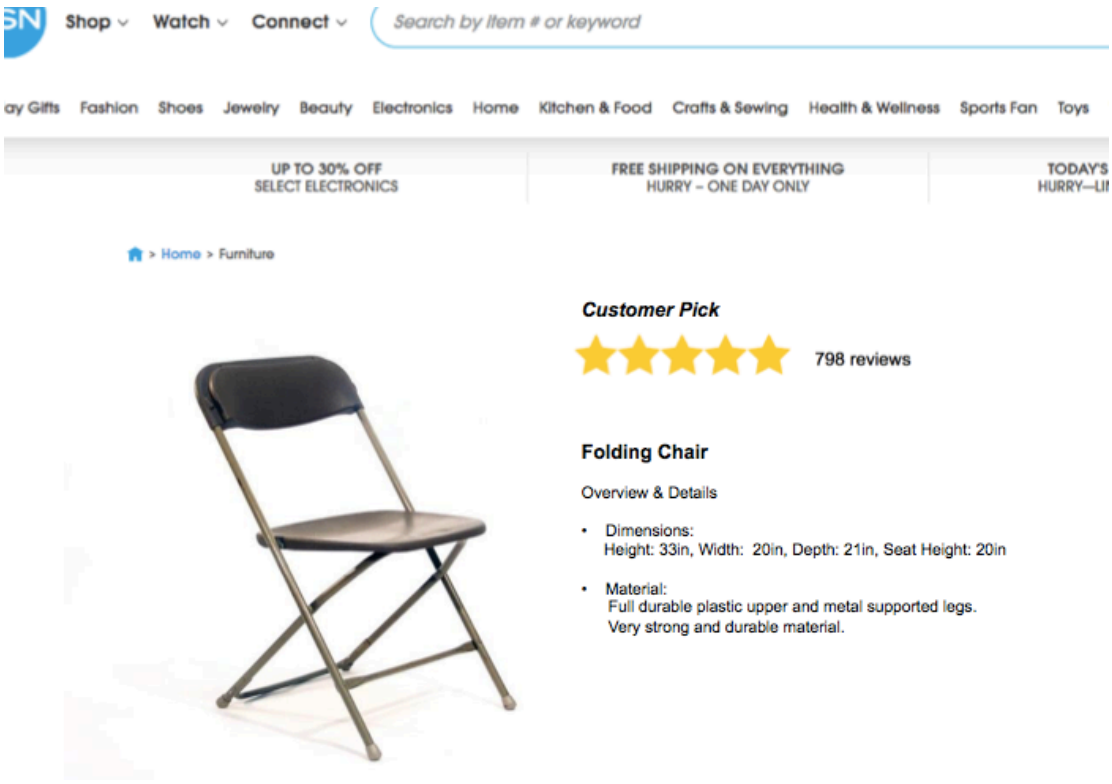
Appendix D (continued)

	Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
a) Purchasing this product would be a bad way to spend my money.	○	○	○	○	○	○	○
b) If I bought this product, I would be concerned that the financial investment I would make would not be wise.	○	○	○	○	○	○	○
c) If I bought this product, I would be concerned that I really would not get my money's worth from this product.	○	○	○	○	○	○	○

	Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
a) This product would not fit in with my self-image.	○	○	○	○	○	○	○
b) Purchasing this product would be risky, because my friends, relatives or colleagues would not approve of it.	○	○	○	○	○	○	○
c) Purchasing this product would be risky, because others would think less of me.	○	○	○	○	○	○	○

_____ page break _____

Appendix D (continued)



Imagine yourself intending to purchase the product above and indicate how you feel:

	Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
a) I am confident in my choice of this product.	○	○	○	○	○	○	○
b) I am confident that this product is what I am looking for.	○	○	○	○	○	○	○
c) I am confident that there is nothing wrong with this product.	○	○	○	○	○	○	○

Please rate the design of the product above on a continuum from low to high design.

Low Design			Neutral			High Design
1	2	3	4	5	6	7
○	○	○	○	○	○	○

Appendix D (continued)

_____ page break _____

(Five products to rate followed)

_____ page break _____

TASK 3 out of 4
INSTRUCTIONS:

Now you have the opportunity to share your thoughts about product design in general.

Please indicate your level of agreement to the statements below:

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
a) Owning products that have superior designs makes me feel good about myself.	○	○	○	○	○	○	○
b) I enjoy seeing displays of products that have superior designs.	○	○	○	○	○	○	○
c) A product's design is a source of pleasure for me.	○	○	○	○	○	○	○
d) Beautiful product designs make our world a better place to live.	○	○	○	○	○	○	○

(Example of a trap question):

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
a) For this question, please select "Disagree".	○	○	○	○	○	○	○

Appendix D (continued)

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
a) Being able to see subtle differences in product designs is one skill that I have developed over time.	○	○	○	○	○	○	○
b) I see things in a product ´s design that other people tend to pass over.	○	○	○	○	○	○	○
c) I have the ability to imagine how a product will fit in with designs of other things I already own.	○	○	○	○	○	○	○
d) I have a pretty good idea of what makes one product look better than its competitors.	○	○	○	○	○	○	○

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
a) Sometimes the way a product looks seems to reach out and grab me.	○	○	○	○	○	○	○
b) If a product ´s design really "speaks" to me, I feel that I must buy it.	○	○	○	○	○	○	○
c) When I see a product that has a really great design, I feel a strong urge to buy it.	○	○	○	○	○	○	○

_____ page break _____

TASK 4 out of 4
INSTRUCTIONS:

Please rate how familiar you are with each of the term listed below using a
0 (I have never heard of this artist or term) to
4 (I can talk intelligently about this artist or idea in art) scale.

	I have never heard of...		Neutral		I can talk intelligently about...
	0	1	2	3	4
a) Alessandro Boticelli	○	○	○	○	○
b) Lorenzo Bernini	○	○	○	○	○
c) Impressionism	○	○	○	○	○
d) Andy Warhol	○	○	○	○	○
e) Salvador Dali	○	○	○	○	○

_____ page break _____

Thank you so much for your answers.

LAST TASK
INSTRUCTIONS:

The following set of statements relates to **your demographics.**
Please **choose** the answer that best matches your response.

Do you have an education, interest, or occupation in the field of arts, product design, and/or design in general?

- ○ Yes
- ○ No
- ○ I do not know

What is your age range?

- ○ 20 - 29
- ○ 30 - 39
- ○ 40 - 49
- ○ 50 - 59
- ○ 60 - 69
- ○ 70 or older

Which of the following ethnic groups of the following do you consider to be a member of?

- ○ Non-Hispanic Black (African American)
- ○ Non-Hispanic White (Caucasian American)
- ○ Hispanic
- ○ Asian/Pacific Islander
- ○ American Indian/Alaskan Native
- ○ Other (Please list in the space provided)

What is your household income?

- ○ <$15.000
- ○ $15.000 – $24.999
- ○ $25.000 – $34.999
- ○ $35.000 – $49.999
- ○ $50.000 - $74.999
- ○ $75.000 – $99.999
- ○ $100.000 +
- ○ Would rather not say

How can your occupancy be categorized?

- ○ Homemaker
- ○ Professional
- ○ Retired
- ○ Service Worker
- ○ Skilled Labor
- ○ Student
- ○ Other

What is your level of education?

- ☐ No High School Diploma
- ☐ High School Diploma
- ☐ Some College
- ☐ Associate Degree
- ☐ Bachelor's Degree
- ☐ Master's Degree
- ☐ Doctorate
- ☐ Other (Please list in the space provided)

In which U.S. region do you currently live?

- ○ Northeast
- ○ Midwest
- ○ South
- ○ West
- ○ Other (specify)

Appendix E

Results from Repeated Measures ANCOVA with Purchase Intentions as a Dependent Variable

Effect	Correction	*df*	*F*	*p*	*Partial Eta*^{2}
DV: Purchase Intention					
Design Aesthetics	Huynh-Feldt	1.696	5.774	0.006	0.048
Design Aesthetics * Age	Huynh-Feldt	1.696	3.221	0.050	0.027
Design Aesthetics * Aesthetic Expertise	Huynh-Feldt	1.696	4.299	0.020	0.036
Design Aesthetics * Product Confidence	Huynh-Feldt	1.696	3.941	0.027	0.033

Results from Repeated Measures ANCOVA with Perceived Risks as Dependent Variables

Effect	Correction	*df*	*F*	*p*	*Partial Eta*^{2}
DV: Psycho-Social Risk					
Design Aesthetics	Huynh-Feldt	1.725	4.76	0.013	0.04
Design Aesthetics * Age	Huynh-Feldt	1.725	3.604	0.035	0.03
Design Aesthetics * Aesthetic Expertise	Huynh-Feldt	1.725	0.747	0.457	0.006
Design Aesthetics * Product Confidence	Huynh-Feldt	1.725	1.607	0.206	0.014
Functional Risk					
Design Aesthetics	Huynh-Feldt	1.856	3.954	0.023	0.033
Design Aesthetics * Age	Huynh-Feldt	1.856	4.159	0.019	0.035
Design Aesthetics * Aesthetic Expertise	Huynh-Feldt	1.856	0.351	0.688	0.003
Design Aesthetics * Product Confidence	Huynh-Feldt	1.856	1.336	0.264	0.011
DV: Financial Risk					
Design Aesthetics	Huynh-Feldt	1.873	4.837	0.010	0.04
Design Aesthetics * Age	Huynh-Feldt	1.873	2.586	0.084	0.022
Design Aesthetics * Aesthetic Expertise	Huynh-Feldt	1.873	4.321	0.016	0.036
Design Aesthetics * Product Confidence	Huynh-Feldt	1.873	4.355	0.039	0.036