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der Christian-Albrechts-Universität zu Kiel

**Gender Differences in Response to Visual Harmony:
Disentangling Biological and Social Factors**

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“The consumer isn’t a moron; she is your wife.” (David Ogilvy, 1964, p. 96)

*„Zum Erfolg gibt es keinen Lift.
Man muss die Treppe benutzen.“*

(Emil Oesch, 1894-1974)

Danksagung

Einige Zeit, unzählige gelesene wissenschaftliche Artikel, zahlreiche durchgeführte Studien, monatelange Datenauswertungen, eine nervenaufreibende Schreibphase, aber auch einige spannende Konferenzen und Reisen rund um die Welt, wertvolle internationale Kontakte, viele Gespräche und E-Mails, anregende Mittags- und Kaffeepausen sowie unvergessliche Sommerfeste und Weihnachtsfeiern später ist es geschafft.

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Kristina Haberstroh

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List of Abbreviations

ANCOVA	Analysis of Covariance
ANOVA	Analysis of Variance
BSRI	Bem Sex-Role Inventory
CI	Confidence Interval
CVPA	Centrality of Visual Product Aesthetics
EV	Explained Variance
F	Fisher-Snedecor Distribution
FMCG	Fast Moving Consumer Goods
H _{1...x}	Hypothesis
Hz	Hertz
IAT	Implicit Association Test
IFC	Item-Factor-Correlation
LCD	Liquid-Crystal Display
LL	Lower Limit
M	Mean
md-IAT	multi-dimensional IAT
ms	millisecond
n	number of participants/sample size
ns	not significant
p	probability
r	reverse coded item or Pearson's r
RET	Repeated Evaluation Technique
SD	Standard Deviation
SE	Standard Error
t	t-Distribution
T _x	Time
UL	Upper Limit
USA	United States of America
Q	Quartile
α	Cronbach's Alpha

1 Introduction

1.1 Motivation and Scope

Creating persuasive visuals is a key consideration in the value creation and the communication functions of marketing (Bloch, 1995; Homburg et al., 2015; Orth & Malkewitz, 2008). Effects of visual design on consumer response have been established with a number of marketing stimuli including products (Bloch, 1995; Cho & Schwarz, 2010), packages (Orth & Crouch, 2014), and logos (Henderson et al., 2004; Zhang et al., 2006). Even with subtle visual cues, such as the typeface used in a solicitation letter, attractive designs can favorably impact consumer response (Giese et al., 2014). In the marketplace visual design distinguishes offers and aids in the formation of consumer relationships (Hollins & Pugh, 1990), driving first impressions and judgments which in turn affect consumption decisions (Bloch, 1995). A key consideration in visually designing offers is to increase their attractiveness. Visual attractiveness “emerges from patterns in the way people and objects relate” (Reber et al., 2004, p. 365) and can be defined as an aesthetically pleasing subjective experience that is directed towards an object (Kubovy, 2000). As a key influencer of consumer behavior (Veryzer, 1993), attractiveness can capture attention (Pieters et al., 2010), generate liking (Cho & Schwarz, 2010), trigger approach behaviors (Orth & Wirtz, 2014), add to an offer’s value (Chitturi et al., 2008) and, ultimately, impact choice (Creusen & Schoormans, 2005).

Three streams of research have examined drivers of attractiveness such as properties of the stimulus, characteristics of the viewer, and, finally, stimulus-viewer interactions.

Among stimulus properties generic design factors and ultimately specific elements conspire to impact individual perception, processing, and response (Henderson & Cote, 1998). Derived from the Gestalt principle (Koffka, 1935), the generic design factor harmony has been identified as a key influencer with studies converging on the finding that harmony in a stimulus’ visual appearance usually relates positively to attractiveness (Henderson & Cote, 1998; Orth & Malkewitz, 2008). At the core of Gestalt theory lies the idea that designers compose visuals by combining basic aesthetic elements such as shapes, materials, and colors which in turn are decoded by consumers by aggregating these elements into more complex higher-order factors of design (Bloch, 1995; Noble & Kumar, 2010). One such important higher-order factor of design is visual harmony, which can be defined as a congruent pattern

or an arrangement of parts that combines symmetry and balance (Henderson & Cote, 1998; Henderson et al., 2004) and captures configural aspects of a stimulus, referring to the extent to which the arrangement of visual elements makes the whole composition coherent (Veryzer, 1993), a unified pattern (Kumar & Garg, 2010), and aesthetic (Lin, 2013). Therefore, in line with Gestalt psychology (Henderson & Cote, 1998) and perceptual fluency (Reber et al., 2004), harmony is a major driver of consumers' evaluation of a visual's attractiveness (Eckman & Wagner, 1994) for a wide scope of stimuli ranging from the relatively subtle (e.g., logos: van der Lans et al., 2009, and typefaces: Henderson et al., 2004) to the more complex (e.g., packages: Orth & Malkewitz, 2008, and products: Veryzer & Hutchinson, 1998).

Reflecting the constructivist view of beauty as a function of idiosyncratic qualities of the beholder (Kubovy, 2000), a second stream of research has focused on viewer characteristics responsible for divergent attractiveness evaluations (Jacobsen & Höfel, 2002), hereby highlighting individual differences such as centrality of visual aesthetics (Bloch et al., 2003), personal taste (Holbrook & Schindler, 1994), motivation (Chitturi et al., 2008), and knowledge accessibility (Zhang et al., 2006). Importantly, initial evidence points at the possible role of gender as an influencer of design evaluative outcomes.

The stimulus-viewer interaction perspective integrates the objectivist and subjectivist views. The interactionist paradigm posits that attractiveness is grounded in the processing experiences of the perceiver, which are in part a function of stimulus properties such as harmony (Reber et al., 2004). For example, Zhang et al. (2006) found that an individual's self-concept interacts with visual roundness. More precisely, individuals with an independent self-concept find abstract angular shapes relatively more attractive, whereas individuals with an interdependent self-concept find rounded shapes more attractive.

Despite these findings, significant gaps remain in the understanding of how a person's gender impacts their response to marketing visuals that vary in design harmony, which is the focus of this thesis. Biological gender or sex (used interchangeably here) is thought to be a key discriminator in consumer response to visual design in which males and females find different types of aesthetic appeals attractive (Crilly et al., 2004; Holbrook, 1986; Moss, 2009). In practice, sex has been and continues to be one of the most commonly employed basis for segmenting markets because it (1) is easy to identify, (2) easy to access, with (3) sex-based segments being measureable, and (4) leading to target groups usually large enough to be profitable (Darley & Smith, 1995; Wolin, 2003). That is why marketers and advertisers spend millions on sex-based advertising (Meyers-Levy & Loken, 2015). Coca-Cola, for

example, in an attempt to appeal to buyers of low-calorie soft drinks, gears Coca-Cola zero towards male audiences and Diet Coke towards female audiences. While there is no immediately recognizable difference in ingredients between the two sodas, the packages show striking differences in visual design: Coca-Cola zero exhibits stark contrast in colors and a dominant typeface while Diet Coke exhibits colors and a soft and round typeface that conspire to appear visually more harmonious (see Figure 1).



Source: www.dietcoke.com/www.us.coca-cola.com

Figure 1: Visual design of low calorie soft-drinks (Diet Coke versus Cola Zero)

Gillette employs similar differences in visual design of female and male razors in order to better tailor their products to target audiences (see Figure 2): While razors for females are characterized by a harmonious interplay of colors and round shapes, razors for males are characterized by contrasting colors and sharp lines.



Source: www.gillettevenus.com/www.gillette.com

Figure 2: Visual design of female and male razors (Gillette Venus for females versus Gillette Fusion for males)

Likewise, to appeal to male consumers, Volkswagen relaunched its brand Beetle in 2012. The ergonomic design gives the car a flatter roof, narrowed windows and a sharp crease along the side to make it look sportier and more masculine (see Figure 3).



Source: www.vw.com

Figure 3: The VW Beetle

Prior research on sex based differences in information processing shows that females are more comprehensive in detecting and processing data to identify connections among the individual data elements than males (Meyers-Levy & Loken, 2015). Given some of the robust findings in this stream of research, one would expect females to be more likely to use lower order design elements and process comprehensively in order to understand higher-order factors such as visual harmony than males. However, the best journals in marketing and consumer behavior have not yet explored the underlying reasons and mechanisms through which such differences in design occur. Moreover, in an era where traditional gender identities (as opposed to sex) are becoming more fluid with females being stronger and more dominant and males being more sensitive and caring (Fugate & Phillips, 2010), for researchers and practitioners, it is important to understand if these design preferences are sex-related or gender identity-related and, additionally, if they persist with implicitly measured attitudes towards visual harmony and gender identity as well as with varying consumption situations.

To address this gap, the present work aims to shed light on the role that gender (biological versus identity) plays in the harmony-attractiveness relationship. Moreover, by testing possible underlying mechanisms, the present work explores the ease with which visual harmony is processed (i.e., processing fluency) and harmony's congruity with the self (i.e.,

self-congruity) as possible process mediators in the harmony-attractiveness relationship including the moderating effects of biological gender versus gender identity on the indirect influence of visual harmony on attractiveness evaluation through processing fluency and self-congruity, respectively. In sum, by focusing on the role of biological (i.e., fluency as a mediator, biological gender as a moderator) versus social factors (i.e., self-congruity as a mediator, gender identity as a moderator) in the visual harmony-attractiveness relationship, I investigate if adopting a social perspective allows better explaining of consumer response to visual harmony than merely focusing on respondent sex. As an ancillary but novel question this dissertation also explores if the nature of sex- and gender identity-related effects hold true when employing an implicit measure (i.e., implicit association test [IAT]) and when varying the consumption context (public versus private situation). By doing so, the present study makes at least four contributions:

First, by examining harmony (a configural design factor) this work adopts a holistic perspective, rather than the elemental view taken in investigations on specific design elements such as unity (Veryzer & Hutchinson, 1998), proportion (Pittard et al., 2007), shape (Zhang et al., 2006), or symmetry (Jacobsen & Höfel, 2003). Examining configural properties is thought to provide better insights into consumer response than elemental approaches (Kumar & Garg, 2010), because human aesthetic appreciation of visuals is a holistic experience (Hekkert, 2006).

Second, I adopt an interactionist perspective by examining how design harmony and different concepts of gender interact in influencing attractiveness. Only a few studies have focused on how stimulus-viewer interactions shape attractiveness of artifacts (Furnham & Walker, 2001). Yet, there is substantial evidence that integrating the objectivist with the subjectivist perspective is superior to stimulus-only and to viewer-only approaches in terms of explanatory power (Alba & Williams, 2013). Hereby, this thesis aims at understanding how biological gender versus gender identity interacts with harmony in marketing visuals.

Third, by clarifying the process of how visual harmony relates to attractiveness (i.e., self-congruity versus processing fluency), this study views individual differences in aesthetic appreciation of marketing artifacts through a new theoretical lens. Self-congruity, for example, is an acknowledged concept in research on consumer response to visual information (e.g., Breazeale & Ponder, 2013). Linking an individual's concept of harmony in social relations and their response to visual harmony in marketing artifacts with self-congruity adds a novel perspective to existing studies, and ties in with self-referencing as a mediating

mechanism between individuals' perceptions of visual stimuli and their subsequent evaluation (Debevec & Romeo, 1992).

Fourth, the present work attempts to figure out in which context biological gender is important and in which social gender identity. Following Spence (1993), most psychologists view human gender as a multifactorial concept, comprising multiple gender-related factors that may be activated and influence individual behaviors in certain situations (e.g., in a public situation) but not in others. In other words, the situational context can stimulate a certain part of the self-concept to take temporary precedence over the other parts. By manipulating the situational context of consumption (i.e., in the presence of others versus alone), gender or, in fact, a certain gender construct can be stimulated in order to make this concept more (or less) salient.

In addition, previous studies are limited in terms of the specific design elements investigated (i.e., shape: Zhang et al., 2006), and types of visuals used (i.e., logos: van der Lans et al., 2009), leaving researchers and practitioners in doubt as to what the implications are for generalizing insights across types of stimuli. By examining marketing visuals ranging from the more conspicuous (products and packages) to the more subtle (logos and typeface), these characteristics are tested as possible boundary conditions. Understanding these relations should enable marketing managers and designers to more successfully employ design harmony across target audiences and types of marketing visuals.

1.2 Organization

Summarizing and refining what is known about marketing and consumer psychology research in relation to visual harmony and gender issues, the theoretical part of this thesis is structured as follows: After an introduction, chapter 2 reviews literature on the visual design of products, the generic design factor harmony, and consumer response to visual harmony, including a comprehensive overview and empirical studies. Then a detailed overview on the role of gender in consumer behavior follows, with particular emphasis on the effect of sex on the evaluation of visual harmony. Chapter 3 also presents research on the underlying process mechanisms of fluency and self-congruity, followed by a review detailing the moderating effects of biological gender versus gender identity on the indirect design harmony-attractiveness relationship. Chapter 4 sheds light on the role of social expectations in gendered responses by introducing the IAT and its implementation in gender and design research. This chapter concludes with the role of the situational context on gendered design responses.

Employing different marketing visuals, samples, and methods, seven studies conspire to generate evidence for gender's (biological and identity) role in the harmony-attractiveness relationship. Therefore, the empirical part of this thesis is structured as follows: Study 1 aims at clarifying what facets of harmony (e.g., symmetry, balance, and unity) contribute more or less to the overall harmony effect. Study 2 tests if there are any sex differences in harmony attractiveness evaluation. Study 3 explores if these differences remain robust in the presence of other personality correlates. Previous studies are extended in Study 4 and Study 5 by focusing on fluency and self-congruity as possible process mediators and by exploring the role of respondent sex as opposed to gender identity. Study 6 uses an IAT to investigate gender identity and sex differences in implicit harmony attractiveness evaluation and implicit identification with visual harmony. Study 7 focuses on the influence of the social context of consumption situation, while controlling for other personality and design covariates and social desirability. Finally, the present work closes with a general discussion of the results including implications for research and practice, elaborating guidelines for optimizing products, packages, logos, and typefaces. Both chapter 7 and chapter 8 illustrate a summary of the empirical studies and their results in English and German, respectively.

2 Visual Design and Harmony

This chapter introduces visual harmony as an important generic factor of design that has gained a lot of attention in consumer psychology.

Section 2.1 describes the concept of visual design focusing on its aesthetic and symbolic functions. Section 2.2 introduces Gestalt theory and defines the generic design factor *harmony*. In line with both Gestalt psychology and perceptual fluency, section 2.3 highlights the positive effect of visual harmony on consumer evaluation of a visual's attractiveness. Because recent research suggests that the influence of visual harmony on a stimulus' attractiveness may not be as universal as previously thought, with a few influencers possibly moderating the relationship, section 2.4 gives a literature overview on consumer responses to visual harmony. Finally, a summary of the section is given and the relevance for the empirical studies is discussed in section 2.5.

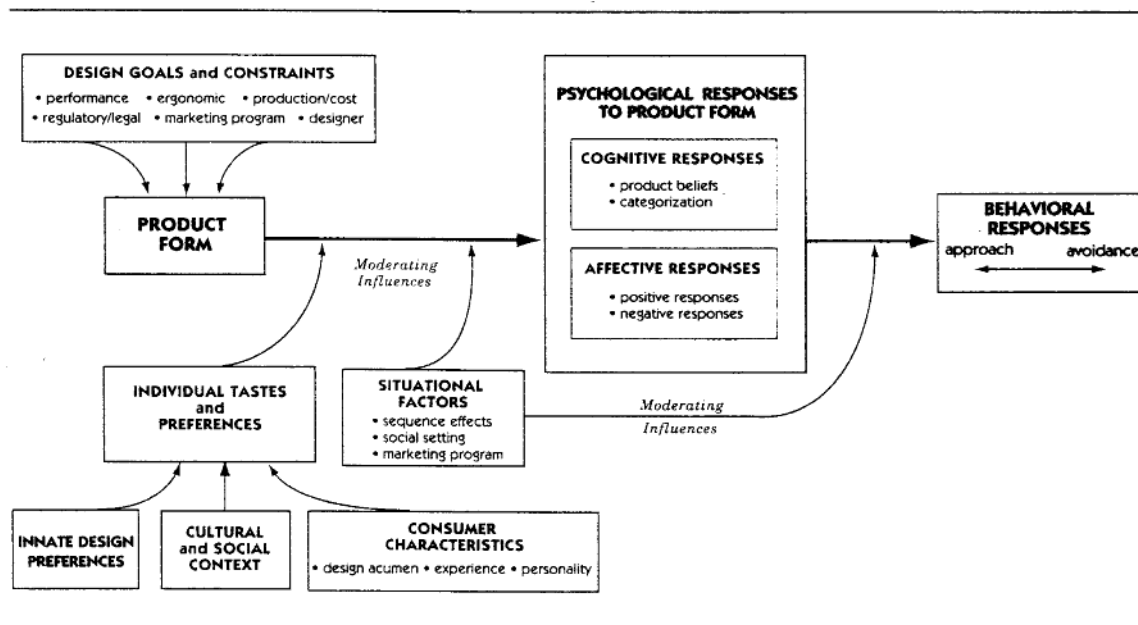
2.1 Visual Design

“The physical form or design of a product is an unquestioned determinant of its marketplace success.”

(Bloch, 1995, p. 16)

While human response to design is informed by the full range of input received through all senses (vision, touch, taste, smell, and hearing), this chapter focuses solely on visual design because the sense of vision is the primary one (Hollins & Pugh, 1990).

Visual design is an important phenomenon in our lives and a key consideration in creating commercial offers (Bloch, 1995). Marketing visuals in a stricter sense include logos, typefaces, packages, and the design of products, and in a broader sense include interiors of retail environment, cars, or servicescapes (Orth & Crouch, 2014). Bloch (1995) conceptualizes consumer reactions to the visual design of products (see Figure 4).



Source: Bloch, 1995, p. 17

Figure 4: A model of consumer responses to product design

According to his framework, designers create the visual appearance of a product by combining basic elements such as shape, materials, and colors, with the aim of forming a unified whole. When viewing a visual, design elements are then aggregated into more complex higher-level factors of design. Initially, Henderson and Cote (1998, 2004) identified naturalness, harmony, and elaborateness as generic design factors for logos and typefaces. Orth and Malkewitz (2008) later corroborated these three design factors with more complex objects such as packages of fast-moving consumer goods. These factors also apply across national samples and can thus be considered universal (van der Lans et al., 2009). Taken together, extant research suggests that consumer response to design should be studied from a perspective of higher-order design factors rather than single design elements.

Moreover, viewer response to visual design includes cognition and affect. Cognitive response refers to the judgments consumers consciously form about a stimulus. These judgments often include aesthetic impression (e.g., judgment of attractiveness), semantic interpretation (e.g., ease of use, functional benefits, and quality), and symbolic association (Crilly et al., 2004). For example, the symbolic associations elicited by a product or brand may transmit the kind of person someone is or wants to be because consumers use possessions to create and define their self-concept (Creusen & Schoormans, 2005). Affective response includes feelings such as pleasure, and extends to liking (Reber et al., 2004). Ultimately, design-evoked cognition and affect influence consumer behavior towards the stimulus, often conceptualized as approach-avoidance (Bloch, 1995).

Creusen and Schoormans (2005) summarize the functions of visual design as follows (see Table 1).

Table 1: Six functions of visual design

Function of visual design	Influence on consumers
Attention drawing	Draw consumer attention (e.g., in-store)
Categorization	Offer possibility for differentiation from the product category
Functional	Serve as a cue for features/functionalities
Ergonomic	Show parts for consumer-product interaction
Aesthetic	Serve as basis for aesthetic appreciation
Symbolic	Serve as basis for symbolic product associations

Source: Adapted from Creusen & Schoormans, 2005, p. 75

Because the focus of this present research lies on the aesthetic and symbolic functions of visual design, both roles will be described in more detail on the following pages.

Aesthetic function

According to the philosopher Baumgarten, ‘aesthetics’ refer to sensuous delight as a mostly automatic process, involving perceptual analyses and implicit information integration (Hekkert, 2006). Leder and colleagues (2004) extend this definition by integrating the object’s explicit classification, its interpretation and evaluation, resulting in an aesthetic judgment. This research focuses on the judgmental approach which stresses the (visually mediated) physical attractiveness or beauty of marketing visuals as an evaluative outcome.

Aesthetics and thus attractiveness of a stimulus follow Gestalt principles with commonly acknowledged drivers of attractiveness including balance, proportion, harmony, and variety (Kim, 2006; Kumar & Garg, 2010). Furthermore, consumers increasingly make brand or product choices based on the aesthetic value of the offer (Bloch et al., 2003). In other words, “beauty matters” (Hassenzahl, 2008, p. 287) which is why a key consideration in visually designing commercial stimuli is to increase their attractiveness (Dion et al., 1972; Orth & Malkewitz, 2008). Attractive designs catch viewer attention (Pieters et al., 2010), enhance liking (Bloch, 1995), add value (Orth et al., 2010), distinguish offers (Orth & Malkewitz, 2012), and build equity (Henderson et al., 2003). Capturing the hedonic value of an offer, attractiveness also contributes to the formation of consumer-brand relationships (Chitturi et

al., 2008), preferences (Stoll et al., 2008), intentions (Chitturi et al., 2008), and behavior (Orth & Wirtz, 2014). Although consumer behavior may be influenced by a score of other factors, a stimulus' attractiveness plays a pivotal role as it shapes the first encounter. Furthermore, Reimann et al. (2010) found that attractive packages significantly increase the reaction time of consumers' choice responses and that they are chosen over products with well-known brands in standardized packages, despite higher prices.

Finally, it is important to note that aesthetic evaluation is an interaction between object and perceiver. For example, Bloch et al. (2003) found that some consumers are more aesthetic oriented than others due to differences in the so-called centrality of visual product aesthetics (CVPA). CVPA captures the extent to which a consumer (1) values design, (2) responds to design, and (3) evaluates design with acumen. Additionally, it has been shown to moderate the effect of product design on attractiveness evaluation (Bloch et al., 2003; Orth et al., 2010).

Symbolic function

Creusen and Schoormans (2005) showed that, apart from bringing aesthetic delight, for consumers the most important function of visual design is the symbolic meaning. The importance of symbolic meaning can be understood by noting that products are an important means for self-expression and identity formation. Over the last decades, consumer, marketing, and psychology scholars have expressed an increased interest in the concept of self. Prevalent in consumer research is Belk's (1988) use of the terms "self," "sense of self," and "identity" as synonyms for how a person subjectively perceives who she or he is. According to his theorizing, individuals possess a core self that is expanded to include possessions such as products and brands that then become part of the extended self. The groups' facet of the self is central to Social Identity Theory (Tajfel & Turner, 1979) which posits that people define their self-concepts by their connections to groups. Some researchers claim that our most salient and central identity in the multitude of identities that define us is our sense of ourselves as being female or male (Avery, 2012). Researchers in marketing adopted this theory (Algesheimer et al., 2005; Muniz & O'Guinn, 2001) to explain how people use brands, products, symbols, and other artifacts to construct and maintain identity (O'Donohoe, 1994). In line with symbolic interactionism theory (Levy, 1959; Solomon, 1983) consumers reflexively refer to their self-concept when encountering marketing stimuli, utilizing them as symbols (Lam et al., 2013), generally behaving in agreement with their most salient self (Oyserman, 2009).

To be more precise, the symbolic function of visual design describes what the product says about its owner/user or can be defined as the “perceived message a product communicates regarding a consumer’s self-image to both the consumer and others on the basis of visual elements” (Homburg, 2015, p. 44). Findings from design research indicate that visual elements (such as color and shape) are not only perceived in terms of their functional (formal and technical) properties but also in terms of symbolic connotations they embody. For example, Zhang et al. (2006) showed that rounded logos were associated with less aggressiveness than angular logos. Likewise, van Rompay et al. (2005) demonstrated a link between a product’s relative height and perceived dominance. Some symbolic meanings of visual design are affective or embodied, some involve cognitive evaluations. Finally, the symbolic function influences how a product is comprehended and evaluated (Bloch et al., 2003).

Returning to Bloch’s model of consumer response to product design, a number of individual and situational factors can impact how visual design relates to consumer response. Prominent among those factors are individual differences in visual perception (e.g., CVPA: Bloch et al., 2003; field dependence: Orth & Crouch, 2014), but also enduring traits and personality characteristics such as personal values (Limon et al., 2009) and concepts of self (Zhang et al., 2006). In line with this thinking, initial findings suggest that individual response to visual design could be a reflection of the values and self-concept a person holds (Bloch, 1995; Crilly et al., 2004). In addition, Crilly et al. (2004) claim sex to be one of the most important influencing moderators of consumer response.

2.2 Harmony: A Generic Design Factor

“Harmony is a congruent pattern or arrangement of parts that combines symmetry and balance and captures good design from a Gestalt perspective.”

(Henderson & Cote, 1998, p. 16)

Design research has made great strides with the advent of Gestalt psychology. Conceived in the 1920’s by German psychologists Wertheimer, Koffka, and Köhler (e.g., Koffka, 1935), the Gestalt principle posits that viewers group concrete elements (e.g., colors, shapes, text, and surfaces) of a visual scene together such that they form a greater whole. Designers are

particularly interested in the Gestalt principle because it provides them with a widely acknowledged and commonly applicable conceptual model for explaining the human tendency to group objects. According to Gestalt theory, the whole is not merely the sum of its parts or elements, but rather a holistic (higher-level) configuration (or interpretation) which appears unified (Graham, 2008) and more attractive (Eysenck, 1942; Reber et al., 2004). From an evolutionary standpoint this perceptual tendency of grouping allowed humans to detect objects or to identify meaningful wholes such as the tiger partly hidden behind the tree (Hekkert, 2006). Therefore, the perception of harmony requires that the consumer is able to derive the connections from the various elements in the composition.

Central to the Gestalt theory is the idea of “Prägnanz”. The Law of Prägnanz can be formulated as: “The psychological organization will be as “good” as the prevailing conditions allow” (Koffka, 1935, p. 138). The most important factors or principles that contribute to perceptual organization are: good continuation, proximity, equality, closure, symmetry, and common fate. Good continuation describes lines that are perceptually continued when they appear interrupted. The factor proximity is characterized by automatic grouping of dots and lines that are close to each other. Equality refers to the tendency to group parts of same colors or shapes. Closure means that parts of the image that form a closed area or volume tend to be seen as such. Symmetry will be defined later in this chapter. Finally, elements such as dots and lines that move in a common direction and speed are viewed together. This is known as common fate. Sometimes Gestalt principles lead to incorrect or bistable interpretations. A classic example of bistability is the Rubin vase/face illusion (named after Edgar Rubin, the Danish psychologist). In this illusion shown in Figure 5 the observer flips between the perception of two faces and a vase in the foreground (Nefs, 2008).



Source: Rubin, 1915

Figure 5: Rubin's vase

Adopting this Gestalt perspective, marketing researchers concluded that consumers perceive specific “constitutive” elements of visual design and organize them into more

complex categories (Veryzer, 1999). Generic design factors represent such a higher-order category, tracing back to more basic and measurable design elements (Orth & Malkewitz, 2008). Harmony is one of the important generic factors of design (Henderson & Cote, 1998) and a key driver of attractiveness (Kumar & Garg, 2010) for logos, typefaces, packages, and products across different countries (Henderson & Cote, 1998; Orth & Malkewitz, 2008; van der Lans et al., 2009).

The Oxford English Dictionary (2014) defines harmony as the combination or adaptation of parts, elements, or related things, so as to form a consistent and orderly whole. Synonyms of harmony are agreement, accord, and congruity. Design researchers more narrowly view harmony as “a congruent pattern or arrangement of parts that combines symmetry and balance and captures good design from Gestalt perspective” (Henderson & Cote, 1998, p. 16), or as the degree to which the visual resources of a composition’s design form a coherent, unified pattern (Kumar & Garg, 2010).

Both perspectives highlight key characteristics of harmonious designs such as symmetry, proportion, balance, contrast, and unity. These elements are employed to make a design well-ordered and, therefore, favorable to look at. According to Henderson and Cote’s (1998) research, for instance, a logo that uses elements symmetric around multiple axes would be perceived as more harmonious than one that does not. For typefaces harmony includes balance, smoothness, symmetry, and uniformity (Henderson et al., 2004).

Among those elements, *symmetry* affects the visual perception of form and is detected holistically during the first glance (Locher & Nodine, 1989). Symmetry can be achieved with relative ease by reflecting objects about one or more axes (Hekkert & Leder, 2008). *Proportion* can be defined as the relationship between the horizontal and vertical dimensions (Wong, 1993) and some proportions – especially the one labeled “divine” (a ratio of 1.618:1) – are more aesthetically pleasing than others (Plug, 1980). *Balance* in design represents equilibrium between two weights or components of the design (Henderson & Cote, 1998). Another consideration in creating harmonious designs is the interplay of colors (Wei et al., 2014). Low *contrast* between colors that appear close to each other, matching color combinations, and little variety in colors make for more harmonious designs (Lin, 2013; Orth & Malkewitz, 2008). As such, color harmony is defined as an interaction between saturation harmony and hue and lightness harmony (Pieters, 1979). Kumar and Garg (2010) emphasize *unity* as a constitutive element of design harmony. Here, harmony is defined as the degree to which the visual resources of a composition’s design form a coherent, unified pattern. This is

why harmony and unity are often used interchangeably (Lin, 2013). Unity hereby refers to a “congruity among the elements of a design such that they look as though they belong together or as though there is some visual connection [...]” (Veryzer, 1993, p. 226).

Finally, design harmony (especially referring to shapes and silhouettes) traces back to smoothness, roundness, and visual connectedness (Henderson et al., 2004). Angular (unharmonious) designs relate to low harmony and tend to induce associations with conflict and masculinity, whereas roundness is associated with friendliness and softness (Pittard et al., 2007). Roundness has been suggested to be a major driver for cultural differences in response to design harmony.

In sum, a number of design characteristics and elements contribute towards visual harmony, leading Lin (2013, p. 1114) to conclude that harmony is “the extent to which the arrangement of design elements makes the relationship between the elements aesthetically pleasing”. Figure 6 gives a pictorial overview on the main design characteristics (i.e., symmetry, balance, unity (variety), and color contrast) constituting visuals high versus low in design harmony.

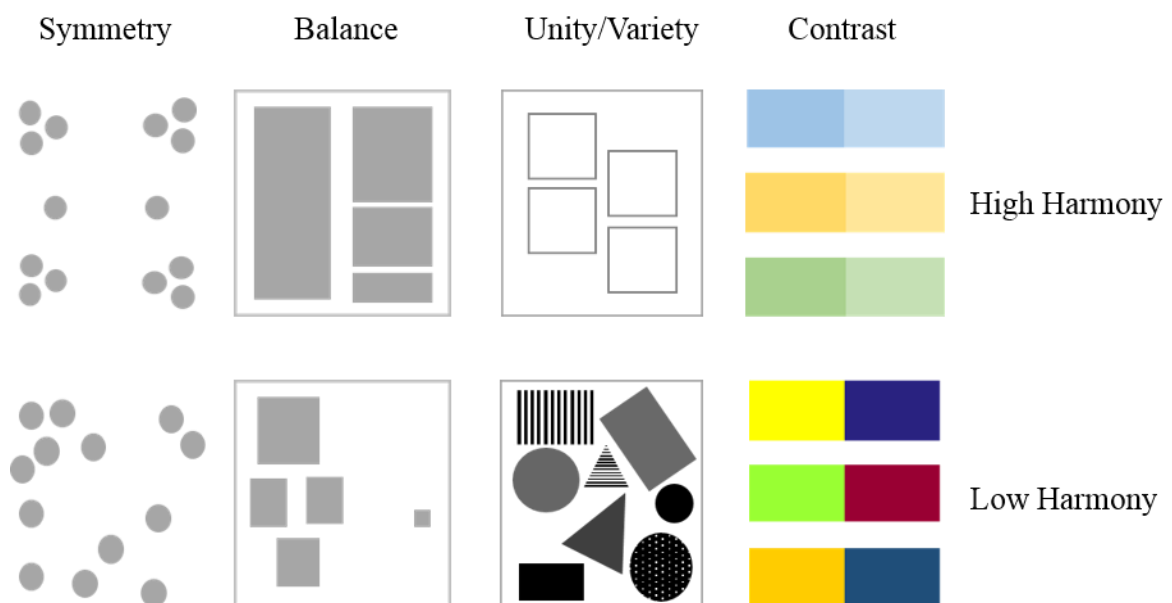


Figure 6: Design characteristics of visual harmony (low versus high)

Hence, partially replicating and extending previous research:

H1: Marketing visuals high in harmony will be rated as...

a: ...more symmetrical...

b: ...more balanced...

c: ...more unified...

d: ...less complex (or varied)...

e: ...less contrasty (in terms of color)...

...than marketing visuals low in harmony.

2.3 Harmony and Attractiveness

“Simply put, we like to look at pattern that allow us to see relationships or create order.”

(Hekkert & Leder, 2008, p. 262)

So far, it is known that designers select and combine visual elements (e.g., lines, curves, angles, and colors) and organize them by following “aesthetic principles” to make the composition look attractive (Coates, 2003). These principles commonly include lower-order and higher-order elements of design (see Arnheim, 2004, for a full list). This study is particularly interested in the positive effect of visual harmony.

In marketing research, Henderson and Cote (1998) were among the first to provide a typology of higher-order design principles. They suggested that three principles are particularly important in eliciting positive customer responses. Aside from visual elaborateness and visual naturalness the focus lied on visual harmony. Using 195 relatively unknown logos, they established that more (versus less) harmonious logos tend to be preferred, perceived as more distinctive, and generate interest. The importance of this design principle has been corroborated using data from numerous countries such as Argentina, China, or Australia (Henderson et al., 2003; van der Lans et al., 2009) and in the contexts of package (Orth et al., 2010) and typeface design (Grohmann et al., 2013).

Highlighting the relationship between harmony and attractiveness, Lin (2013, p. 1114) concludes that harmony is “the extent to which the arrangement of design elements makes the

relationship between the elements aesthetically pleasing”. In line with his thinking, empirical evidence emphasizes that visual harmony drives attractiveness for marketing stimuli ranging from company logos (van der Lans et al., 2009) to typefaces (Henderson et al., 2004), packages of fast-moving consumer goods (Orth et al., 2010), products (Veryzer & Hutchinson, 1998), and websites (Lin, 2013). Additional studies link specific lower-level elements of harmony to attractiveness, indicating positive effects of unity (Veryzer & Hutchinson, 1998), symmetry (Jacobsen & Höfel, 2003), proportion (Pittard et al., 2007), and roundness (Tzeng et al., 1990), and negative effects of angular forms (Schmitt & Simonson, 1997).

Conceptually, the reasons for attractiveness as a positive evaluative outcome of visual harmony are not fully understood (Hekkert & Leder, 2008). Results of functional Magnetic Resonance Imaging (fMRI) studies in the field of neuroaesthetics provide neurophysiological reasons why deriving the connections between various elements may be inherently rewarding (Ramachandran & Hirstein, 1999). As Ramachandran and Hirstein (1999, p. 21) point “one of the main functions of ‘early vision’ is to discover and delineate objects in the visual field and for doing this the visual areas rely, once again, on extracting correlations [...] The very process of discovering correlations and of ‘binding’ correlated features to create unitary objects or events must be reinforcing for the organism—in order to provide incentive for discovering such correlations [...] this generates a pleasant ‘aha’ sensation.”

Therefore it comes as no surprise that perceptually fluent designs, for which it is easier to draw the connections between the various aesthetic elements, are preferred by consumers (Reber et al., 2004). This is why among possible explanations, the misattribution of processing-induced affect has attracted researcher interest (Reber et al., 2004). People meta-cognitively monitor the mental effort required for processing a stimulus (Schwarz, 2004), and fluent processing instantaneously triggers positive affect (Winkielman et al., 2003). This affect is (mis)attributed to the stimulus, hereby increasing its attractiveness (Reber et al., 2004). Directly linking harmony with attractiveness, fluency studies indicate that visually harmonious stimuli are easier to evaluate than low-harmony counterparts, thereby resulting in higher ratings of attractiveness (Reber et al., 2004).

Linking harmony indirectly with attractiveness, more symmetric, well-proportioned, and smoothly curved designs (i.e., designs higher in harmony) leads to more positive judgments of attractiveness (Raghubir & Greenleaf, 2006). From an evolutionary standpoint, attractiveness and symmetry (as an important design characteristic of visual harmony) have

been linked to fertility (van Gorp & Adams, 2012). There is more evidence that individuals find symmetry more attractive than asymmetry. In line with before mentioned findings, Pecchinenda et al. (2014) showed that this is true not only for aesthetic appreciation of art but also for perceived attractiveness in terms of symmetrical faces and bodies. Again, the reason for this effect is that bilateral symmetry is an indicator of gene quality. Through instinct and association, the same proportions that cause positive responses when individuals view sexually attractive people cause similar (albeit less intense) responses when they view attractive products (van Gorp & Adams, 2012).

According to Palumbo et al. (2015), the preference for curved over angular shapes is explained by the implicit association (as an indirect measure of preference) between roundness and positive concepts. In contrast angularity is implicitly associated with negative concepts. These findings also have practical implications. For example, car designs have moved towards more rounded shapes across last decades.

In sum, several types of arguments have been put forward to explain the positive effect of visual symmetry and harmony on attractiveness. On the one hand, for example, the harmony variable symmetry can serve to evaluate mate and food quality. On the other hand, the visual system can extract visual harmony quickly and efficiently. This would imply an experience of processing fluency. At a more basic level, it has been suggested that because the reward network extends to visual areas of the cortex, pleasure may directly originate from visual stimulation (Bertamini et al., 2013a).

In sum, the present work predicts, also partially replicating previous work:

H2: Visual harmony has a positive influence on attractiveness.

Moreover, the present work assumes that attractiveness evaluation is a dynamic process which reflects changes over time and, in addition, depends on a design's harmony level. This assumption is based on the mere exposure effect introduced by Zajonc (1968). According to him, the "mere repeated exposure of an individual to a stimulus object enhances his attitude toward it" (Zajonc, 1968, p. 1), in particular his aesthetic judgment. Bornstein's (1989) meta-analysis of mere exposure research demonstrates that the effect is a robust and reliable phenomenon. This is shown by the fact that numerous stimuli have been found to increase in attractiveness with repeated contact (e.g., advertisements: Cox & Cox, 1988). Furthermore, this effect is found in a variety of contexts (e.g., cross-modal: Suzuki & Gyoba, 2008), using diverse procedures (e.g., RET: Carbon & Leder, 2005), and among both humans and animals

(e.g., chicken: Rajecki, 1974). Several experiments have ruled out explanations of this phenomenon based on ease of recognition, an increased perceptual fluency, or subjective familiarity. In fact, the mere exposure effect is a simple effective process which “provides a flexible means of forming selective attachments and affective dispositions, with remarkably minimal investment of energy, even when exposures are not accessible to awareness” (Zajonc, 2001, p. 227).

Past research has examined the boundary conditions of the exposure-attitude relationship. For example, Bornstein et al. (1990) investigated the role of boredom as a limiting condition on Zajonc’s (1968) mere exposure effect. According to them, complex stimuli receive more positive affect ratings than simple stimuli at high exposure frequencies, because participants often become bored with simple stimuli more quickly than with complex stimuli. Consistent with these suggestions, Berlyne’s (1970) two-factor model hypothesizes that affect towards a stimulus become more positive as the stimulus becomes increasingly familiar, until boredom occurs and the frequency-affect curve turns downward. In other words, boredom should inhibit the mere exposure effect (Bornstein et al., 1990). Other research refers to the so-called saturation point as a boundary condition. Contrasting this view, alternative models (e.g., Grush’s [1976] attitude-formation model) predict that positive affect toward a stimulus will increase linearly with increasing exposure frequency.

However, as indicated by the relationship between stimulus complexity (or simplicity) and the strength of the exposure effect (Bornstein et al., 1990), stimulus variables also play an important role in this effect. Bornstein et al. (1990) found that affective ratings of simple visuals decline with repeated contact, whereas affect ratings of complex stimuli become more positive. Their findings are consistent with research by Cox and Cox (1988, 2002) who indicated that exposure has a strong positive effect on the evaluation of complex advertisements, and only a slight (and nonsignificant) effect on the evaluation of simple advertisements.

But to my knowledge, no research has investigated the dynamic effect of visual harmony on attractiveness evaluation based on repeated contact. Because visual complexity (unity) is a crucial contributor towards visual disharmony (harmony), I expect visual (dis)harmony to function in similar ways. In other words, because visuals low in harmony elicit an initial level of uncertainty, repetition should make these visuals more comfortable and appealing. Their attractiveness evaluation should benefit from exposure. On the other hand, after repeated

evaluations of harmonious designs, the attractiveness ratings should decrease due to the boredom effect. Hence:

H3: The influence of harmony on attractiveness is dynamic such that visuals high (low) in harmony will be evaluated less (more) attractive in T₂ than in T₁.

Methodological Excursus

Previous research often avoids massive repetition, hereby ignoring the dynamic effect of attractiveness evaluation. In order to test this dynamic under realistic conditions, reflecting object processing in everyday life, the present thesis uses the repeated evaluation technique (RET) introduced by Carbon and Leder (2005). The RET simulates time and exposure effects of everyday life and is based on the mere exposure approach of Zajonc (1968). In line with Bornstein (1989) who found that the average number of stimulus presentations is 20.95, the RET uses 25 rating blocks. Different than Zajonc's passive mere exposure method, the RET is based on deeper elaboration and evaluation of the stimulus. In other words, to simulate a real situation where consumers are actively involved with products, participants have to process the stimuli actively by evaluating them on 25 different attributes (e.g., stylish, creative, and exclusive). Attractiveness of the stimulus is measured before and after this evaluation block.

However, recent research suggests that the influence of visual harmony on stimulus attractiveness may not be as universal as previously thought with multiple individual difference factors moderating the relationship. These moderators include individual factors such as design preferences (e.g., CVPA, Bloch et al., 2003) agreeableness (McManus & Furnham, 2006), and situational factors (e.g., the visual complexity of the context, Orth & Crouch, 2014) which all impact how attractive viewers find stimuli varying in harmony. The following section details consumer responses to visual design.

2.4 Consumer Response to Visual Harmony

“Beauty is no quality in things themselves: it exists merely in the mind which contemplates them and each mind perceives a different beauty.”

(Hume, 1757, p. 136)

Research has found that design elements influence consumer response individually (e.g., color, symmetry, and proportion) as well as jointly (as the holistic factor harmony). Generally, consumers prefer harmony to disharmony because humans have an innate tendency to see things that are close together or that look, sound, or feel as they belong together (Wertheimer, 1925). In other words, consumers prefer designs that follow Gestalt laws of harmony and unity over designs that violate these laws (Veryzer, 1993).

Among the drivers of preference is positive affect. For example, harmonious logo design can elicit positive feelings with viewers (Henderson & Cote, 1998). With Chinese consumers, angular stimuli evoke feelings of power but also of conflict, bad luck, and friction (Schmitt & Simonson, 1997). Japanese respondents perceive abstract figures with rounded elements as good, beautiful, strong, and powerful (Tzeng et al., 1990). The results of an experiment by Veryzer and Hutchinson (1998) provide proof of positive effects of unity on aesthetic emotions across nine different product categories (e.g., bathroom scales, clocks, and telephones).

Regarding cognitive responses, the visual harmony of packaged consumer goods strongly relates to brand personality (Orth & Malkewitz, 2008). Symmetry in abstract patterns is a strong predictor in attractiveness judgments (Jacobsen & Höfel, 2003; Tinio & Leder, 2009). Similar results are found in context of facial attractiveness research where symmetrical faces are preferred over non-symmetrical ones (Grammer & Thornhill, 1994). Harmony also directly and positively impacts the perceived ease of use of websites (Lin, 2013), the price consumers expect to pay for a bottle of wine, and quality judgments (Orth et al., 2010). Taken together, across a range of categories, there is substantial evidence for the impact harmony has on viewer response to visual stimuli including logos (Henderson & Cote, 1998), packages (Orth et al., 2010), and products (Veryzer & Hutchinson, 1998) but also for websites (Lin, 2013).

The reasons for people's overall positive response to visual harmony, however, are not fully understood (Hekkert & Leder, 2008); in part because people lack the ability to articulate the relationship between harmony and their response (Veryzer, 1993). This gap in knowledge is magnified by a number of individual differences that possibly impact the visual design-response relationship. Often classified as personal characteristics, cultural influences, innate design preferences, and situational factors, these individual differences moderate (i.e., enhance or mute) cognitive, affective, and behavioral responses to visual design (Bloch, 1995; Crilly et al., 2004). Evaluation of a design's attractiveness thus not only depends on properties of the stimulus (e.g., the harmony factor) but additionally on characteristics of the viewer. For instance, a person's CVPA (Bloch et al., 2003), motivation (Chitturi et al., 2008), and cultural context (Bloch, 1995) have all been related to divergent outcomes in individuals' evaluation of design attractiveness. In particular, a person's culture has been suggested to be an important factor in how attractive individuals find marketing stimuli (Bloch, 1995; Crilly et al., 2004). Cross-cultural marketing studies, in fact, demonstrate that significant differences exist in how consumers respond to visual harmony overall (Henderson et al., 2003; van der Lans et al., 2009) and specific elements such as angularity (Zhang et al., 2006). The findings of Zhang and colleagues (2006) suggest that these differences in viewer aesthetic preferences for angular versus rounded shapes trace back to people's self-construal, or the view they hold of themselves as either more dependent or more independent from others. An overview of studies examining consumer response to visual harmony and its elements (i.e., symmetry, unity, proportion, roundness, and color contrast) is summarized in Table 2. In summary, not all people respond in the same way to the configural aspects captured in the design factor harmony.

Table 2: Summary of findings on consumer response to visual harmony

Harmony variable	Study	Stimuli	Dependent variable	Moderator	Key findings
Symmetry	Grammer & Thornhill, 1994	Faces	Attractiveness	Sex	Facial symmetry has a positive influence on facial attractiveness ratings.
Symmetry	Jacobsen & Höfel, 2003	Graphic pattern	Aesthetic judgment	None	Symmetry shows a strong positive correlation with beautiful judgments.
Symmetry	Tinio & Leder, 2009	Visual pattern	Aesthetic judgment	None	Symmetry is a strong predictor of beauty judgment.
Unity	Veryzer, 1993	Microwave oven, suntan lotion bottle, sound machine	Preference	Proportion	Unity, proportion, and its interaction have positive influences on preference.
Unity	Veryzer & Hutchinson, 1998	Nine product categories (e.g., lamps, telephones)	Aesthetic response	None	The results provide strong evidence for positive effects of unity on aesthetic response.
Proportion	Pittard et al., 2007	Logos	Preference	Culture	Results show a universal preference for divine proportion across cultures.
Roundness	Tzeng et al., 1990	Icons & graphics	Evaluation, potency, activity, distinctiveness	Country	Japanese perceive rounded graphics as more beautiful and powerful than as Mexicans and Columbians.

Roundness	Zhang et al., 2006	Logos	Attractiveness	Self-construal, consumption situation	People with independent self-construals perceive rounded shapes as less attractive than those with interdependent self-construals. The effect is more pronounced for public than for private consumption.
Roundness	Zhu & Argo, 2013	Arrangement of chairs	Needs	None	A circular arrangement of chairs elicit a need for belongingness, whereas an angular arrangement of chairs elicit a need for uniqueness.
Roundness	Lieven et al., 2015	Logos	Perceived masculinity & femininity	Sex	Angular, bold logo shapes increase perceived masculinity, whereas round, slender logo shapes enhance brand femininity perceptions (regardless of the perceiver's sex).
Roundness	Jiang et al., 2016	Logos	Attribute judgments	None	Round logo shapes are associated with softness, whereas angular logo shapes are associated with hardness.
Color harmony	Wei et al., 2014	Juice packages	Liking, quality expectation	None	Color harmony, liking, and quality of the products are highly correlated.
Design factor harmony	Henderson & Cote, 1998	Logos	Impressions created by logos	None	Harmony has a positive influence on correct recognition and affect (U.S. consumer).
Design factor harmony	Henderson et al., 2003	Logos	Impressions created by logos	None	Harmony has a positive influence on clear meaning and feng shui (Asian consumer).*
Design factor harmony	Henderson et al., 2004	Typefaces	Impressions created by typefaces	None	Harmony creates pleasantness, less engaging fonts, more reassuring fonts, and less prominent designs.

Design factor harmony	Orth & Malkewitz, 2008	Wine packages	Consumer brand impressions	None	Generic holistic designs are associated with brand impressions responses (e.g., excitement).
Design factor harmony	Van der Lans et al., 2009	Logos	Impressions created by logos	Culture	Harmony universally increases positive affect and subjective familiarity. The effect on subjective familiarity differs between the West and Asia.
Design factor harmony	Orth et al., 2010	Wine packages	Price expectation	CVPA	Design harmony exerts a direct effect on price expectations and an indirect effect through quality judgments.
Design factor harmony	Kumar & Garg, 2010	DVD players	Attentional activity, pleasantness	Typicality	Harmony, typicality, and its interaction have positive influences on attentional activity and pleasantness.
Design factor harmony	Grohmann et al., 2013	Typefaces	Brand personality perception	None	When the brand name is typed in a typeface high in harmony, the brand personality perception is more positive (e.g., sincere).
Design factor harmony	Lin, 2013	Websites	Perceived aesthetic, perceived ease of use	None	Harmony has direct effects on perceived aesthetics and perceived ease of use.

Notes: *The positive influence of harmony on meaning and feng shui in Asia and not in the United States is consistent with the values placed on balance and curved elements in Asia (Henderson et al., 2003).

2.5 Summary and Relevance for the Empirical Studies

According to Gestalt psychologists, visual harmony can be defined as a number of design characteristics (such as symmetry, balance, and unity) chosen and blended into a holistic visual design. Furthermore, visual harmony seems to be an established key driver of attractiveness. A number of researchers found that the harmony (or specific elements such as symmetry) of marketing visuals (e.g., logos, typefaces, packages, and products) influences how attractive viewers find them. According to Bloch's framework (1995), several factors play a role in influencing consumer response to design in general, and attractiveness in specifics. That implies that the evaluation of attractiveness not only depends on properties of the stimulus (e.g., harmony) but additionally on characteristics of the viewer.

Nevertheless, several questions remain open for present inquiries. First, it remains unclear which facets of harmony (e.g., symmetry, balance, and unity) contribute more or less to the overall harmony effect (see section 5.1 for Study I). Second, most of the researchers focused on the effect of highly specific single elements (e.g., roundness, Zhang et al., 2006), and employed abstract stimuli instead of realistic marketing visuals. This approach stands in opposition to both Gestalt and evolutionary psychology which stress that consumers tend to group elements into higher-level factors to infer meaning (Hekkert, 2006). These differences represent a major contribution to the present research which examines the effect of visual harmony as a generic factor of design on attractiveness across a range of realistic stimuli (see section 5.2 for Study 2 and 3). Third, in line with literature on the symbolic function of visual design, several studies have investigated different factors as influencers of evaluative outcomes, but only a few have examined how gender impacts the harmony-attractiveness relationship. As individuals heavily rely on gender to define their self-concept (highly committed to gender identity) (Deaux & LaFrance, 1998), this work adopts this perspective and extends it further to discuss how harmony in marketing visuals relates to consumer response contingent upon a person's biological gender and social gender identity. To shed more light on how gender interacts with a design's harmony, chapter 3 will present the role of both biological gender and gender identity in response to visual harmony and the underlying mechanisms of fluency and self-congruity.

3 Visual Harmony and Gender: Sex versus Identity

Based on suggestions that differences may exist in how females and males respond to design harmony, the objective of this chapter is to give an overview on the roles of both biological gender and gender identity in consumer research with special focus on differences in response to visual harmony. Furthermore, the chapter presents different explanatory mechanisms why gender (biological and identity-based) differences might occur. Therefore, section 3.1 reveals gender differences in five areas of consumer research including implications for the present research. The focus of section 3.2 is on sex-related differences in response to design harmony followed by a review of several explanatory approaches in section 3.3. To be more precise, the mechanisms of both fluency (section 3.3.1) and self-congruity (section 3.3.2) are presented in detail. The moderating role of biological gender opposed to gender identity in the harmony-(fluency/self-congruity)-attractiveness relationship is discussed in section 3.4. Chapter 3 concludes with a summary of results and highlights the relevance for the empirical studies.

3.1 Gender in Consumer Research

“For consumer psychologists, understanding how males and females differ in their cognitive processing styles, affective responses, and reaction to marketing stimuli is essential for anticipating their product choices and preferences.”

(Meyers-Levy & Loken, 2015, p. 130)

In general, studies indicate that males are becoming an important market segment for products traditionally targeted towards females (e.g., cosmetic products), while females have become potential consumers for products traditionally communicated to males (e.g., credit cards and beer). This is a result of divorce, a desire to remain single, or having a working spouse. That is why males are more likely to do the household shopping, housework, and meal preparation, whereas more females have entered the work force. As a result, companies such as Procter and Gamble, General Foods, Campbell Soup, and Swanson are expanding their target audience to include males and changing their communication to reach them (Debevec & Iyer, 1986). But more research on gender differences in response to marketing

stimuli (e.g., visual design) is needed to offer practical implications for marketing managers and designers. This leads to the basic question: Are male and female consumers different, and if so, why?

A study by Wolin (2003) revealed that the main focus in consumer research has been in five areas in order to identify and understand gender differences, namely: (1) stereotypical gender characteristics, (2) selectivity hypothesis, (3) spokesperson gender, (4) gender advertising response, and (5) gendered image of products and brands. The findings of each research area will be summarized in the following:

1.) Stereotypical gender characteristics

Gender differences in traits and personality characteristics such as leadership, dominance, promoting harmonious relationships, and self-construal have received considerable attention in literature on gender role stereotyping. According to Betz et al. (1989), females are thought to place less emphasis on competitive success and more on doing tasks well and promoting harmonious relationships. In contrast, males are more concerned than females with income, organizational rank, and leadership.

Cross and Madson (1997) examined the link between self-construal and gender with the result that, in general, males are thought to construct and maintain an independent self-construal, whereas females are thought to construct and maintain an interdependent self-construal. The authors review the psychological literature to demonstrate that many gender differences in cognition, motivation, emotion, and social behavior may be explained in terms of males and females different selves. This is in line with the findings of other researchers (e.g., Triandis, 1995) showing that females are more collective, allocentric, and interdependent than males. In contrast, males are more independent and individualistic than females. Madson and Trafimow (2001) confirmed that females think about themselves more in terms of their relationship with others. Marketing literature shows that advertisements tend to emphasize these gender stereotypes, though at a decreasing rate (Wolin, 2003). Interestingly, these gender differences have consequences for the perceiving and processing of (marketing) stimuli. For example, individuals holding an independent self-construal are expected to prefer information that highlights their uniqueness and individuality. In contrast, individuals holding an interdependent self-construal are expected to attend closely to information concerning relationships, and to encode and organize information in terms

of relationships (Cross & Madson, 1997). The reference to 'processing' leads to next research area on the selective hypothesis.

2.) Selectivity hypothesis

Several studies indicated that females, in fulfilment perhaps of a greater communal orientation, tended to process information comprehensively, while males, in performing their agentic roles, tended to process information selectively (Meyers-Levy & Loken, 2015).

These findings were confirmed by Putrevu (2001) who pointed out that males are selective processors, relying on a subset of highly available and salient cues. Compared with this, females are comprehensive processors who attempt to assimilate all available information before rendering judgment. According to the approach of males being item-specific and females being relational processors, males who are said to pursue agentic goals prefer to elaborate specific details of messages that are personally important to them. In contrast, females who are concerned with relationship-oriented goals try to put single attributes together into a full picture by elaborating their interrelationships.

3.) Spokesperson gender

The consumer behavior literature on spokesperson gender effects has shown that spokesperson gender impacts product image and consumer attitudes. A spokesperson can be a model, primary character, endorser, celebrity, expert, products representative, central figure, or an on-camera talent in an advertisement (Whipple & McManamon, 2002). According to Debevec and Iyer (1986), spokesperson gender is an effective cue in influencing respondents' perceptions of the gender image of products. Whipple and McManamon (2002) underline the relevance of a product's gender image for the impact of spokesperson gender on consumer attitudes. They found that a spokesperson gender effects an advertising message only for products with a gender image, specifically a feminine image, but not for neutral products with no gender image.

Holmes and Urban (1989) shed more light on sex differences in spokesperson effects. According to them, the spokesperson gender is generally noticed by both sexes. To be more precise, males report less favorable attitudes towards advertisements featuring a feminine spokespersons than towards those featuring a masculine spokesperson. In

contrast to these findings, Carsky and Zuckerman (1991) found no interaction effects between the gender of the endorser and the sex of the respondent on credibility of the ad, purchase intention, or attitude towards the ad. In sum, this stream of consumer research on gender effects indicates that controversy exists.

4.) Gender advertising response

The findings of Putrevu (2004) suggest that males and females respond different to print advertisements. In line with the above mentioned classification of males as item-specific processors and females as relational processors, gender is a significant moderator for visual, technical, and information dimensions of complexity. Complex ads seem to engender more positive attitudes and purchase intent among female consumers as opposed to male consumers. In contrast, males prefer simple ads that focus on one or a few key attributes. Females also show preference for advertisements that focus on the product and its relationship to its product category, whereas males value attribute-based advertisement messages that point out the unique features of the claim.

Furthermore, consistent with their distinct gender roles, males have a significant preference for advertising messages with a comparative appeal and that communicate competition, while females show a preference for advertisements featuring harmonious relationships.

Contrary to Putrevu (2004), Jaffe and Berger (1988) investigated the effect of social gender identity instead of the biological distinction between males and females. They found that gender identity influences purchase intention such as individuals with a more masculine identity prefer modern positioning (focused on a work-related scenario) above traditional positioning (focused on a home-related scenario) in print advertisements, whereas individuals with to a more feminine identity prefer a traditional positioning.

5.) Gendered image of products and brands

The gendered image of products has long been demonstrated by consumer research. For example, Milner and Fodness (1996) indicated that (Chinese) respondents perceive most products as clearly masculine (e.g., beer) or feminine (e.g., facial tissue). Males and females were in complete agreement as to the perceived gender of

the products presented in the survey with product user as the primary predictor of product gender perception. A more recent study (Fugate & Phillips, 2010) found that product gendering is still prevalent. Relevant to the present work, marketers commonly provide cues in packaging, colors, product shape, logos, graphics, and brand names to suggest product gender.

Likewise, marketing literature on brand gender showed that consumers holding a masculine (feminine) gender identity prefer brands with a masculine (feminine) image (Worth et al., 1992). Bellizzi and Milner (1991) indicated that females prefer the feminine brand (conveyed through advertising) and males the masculine one. Moreover, Jung and Lee (2006) found that consumer acceptance for cross-gender brand extensions is higher when the extensions is made from a masculine brand to target females than the other way around. These findings are consistent with the suggestion that social expectations can play a role in preference for marketing stimuli, especially when respondents are explicitly aware of their gender. However, the role of social expectations will be reviewed in more detail later on (see chapter 4).

Table 3 gives an overview on the findings on gender differences in the five areas of gender research including implications for the present research.

Table 3: Summary of findings in the five areas of gender-related consumer research

Area	Males	Females	Implications for the present research
Gender role stereotypes	leadership, independent self-construal, individualistic	promoting harmonious relationships, interdependent self-construal, collective, allocentric	indicator for differences in preference for visual harmony (see section 3.2)
Selectivity hypothesis	selective processors, item-specific	comprehensive processors, relational processors	indicator for possible differences in processing fluency (see section 3.3/3.3.1)
Spokesperson gender	mixed results, preference for male spokesperson	mixed results	link to self-congruity (see section 3.3/3.3.2)
Gender advertisement response	comparative appeal in advertisement messages, attribute-oriented	harmonious relationships in advertisement messages, category-oriented	indicator for differences in preference for visual harmony (see section 3.2)
Gendered image of products and brands	preference for masculine brands	preference for feminine brands	link to self-congruity (see section 3.3/3.3.2)

In sum, this overview of gender studies shows that there is little emphasis in this body of research on differences in response to visual design. Nevertheless, these findings help to identify and understand possible sex-related differences in response to design harmony. To shed more light on this issue, the following chapter will discuss sex as an influencer of design evaluative outcomes, the underlying mechanisms of processing fluency and self-congruity, and the role of biological gender as opposed to social gender identity. Because females are important as consumers as they control 80 percent of purchasing decisions, it is important to know whether females' needs as consumers differ from males', and if they are, how they can be met by firms and companies especially by marketing managers and designers. The process of answering these questions is very much at the heart of this work. The results would have implications for marketing and design issues, offering guidance on how to handle differences in design preferences based on consumers' gender.

3.2 Sex-Related Differences in Response to Visual Harmony



„From theoretical materials and from the results of this research, the importance of future developments in gender-oriented products seems irrefutable.”

(Xue & Yen, 2007, p. 25)

The influencers discussed in chapter 2 suggest that the evaluation of attractiveness not only depends on properties of the stimulus (e.g., harmony) but additionally on characteristics of the viewer. It is less clear, though, what role respondent sex plays in a person's evaluation of visual stimuli. Only a few studies in marketing and consumer behavior have directly focused on sex as an influencer in attractiveness evaluations. For example, Holbrook (1986) found respondent sex and personality to have an influence on individual preferences for males' apparel. Outside the realm of marketing and consumer behavior, design research has explored this issue more frequently. Frumkin (1963) demonstrated sex differences in the preference of artwork with females being more appreciative of paintings than males in general, and specifically of modern paintings. A more recent study by Chamorro-Premuzic et al. (2010) indicates that females are likely to prefer simple paintings with happy subjects, whereas males tend to favor more complex, geometrical paintings as well as paintings with troubling content. In face-to-face interviews, three quarters of the design expert interviewees suggested differences between "male" and "female" designs (Moss, 2009). Male designs were associated with angular shapes and straight lines, whereas female designs were associated with fluent and rounded shapes. Xue and Yen (2007) conducted semi-structured interviews with 72 respondents and had them to rank-order product designs (e.g., mobile phones, MP3 players, and fragrance bottles) from best- to least-liked while simultaneously requesting key words for labeling choices. The results indicated that females responded more positively to organic forms and themes of femininity and fluidity, and were more likely to take notice of small details and harmony in the interplay colors. Females also preferred low contrast between colors that appear close to each other, matching color combinations, and little variety in colors, all characteristics that make for more harmonious designs (Orth & Malkewitz, 2008). Males, in contrast, were more likely to prefer angular forms. Furthermore, adopting an evolutionary psychology perspective, design characteristics such as logo shapes and typefaces

influence brand masculinity and femininity perceptions (Lieven et al., 2015). The authors argue that heavier and angular logos and typefaces increase brand masculinity, whereas slender and rounder logos and typefaces enhance brand femininity. These results are consistent with Grohmanns' (2016) findings on communicating brand gender through typefaces. Curved script typefaces (e.g., Monotype Corsiva) enhance brand femininity, whereas angular display typefaces (e.g., Impact) strengthen brand masculinity perceptions. Likewise, an IAT by Palumbo et al. (2015) showed that curved polygons are associated with femininity, whereas angular polygons were associated with masculinity. The authors argue that curved shapes, due to their roundness, might resemble the female body. Table 4 gives a short literature overview on sex-related differences in response to design harmony.

Table 4: Literature overview on sex-related differences in preferences for design harmony

Study	♀ preferences	♂ preferences
Moss, 1999	fluent, rounded shapes and lines	angular shapes; straight lines
Xue & Yen, 2007	organic forms; themes of femininity and fluidity; harmony in the interplay of colors	angular forms; sharp lines
Moss, 2009	soft surfaces; light colors; rounded lines	hard surfaces; dark, contrasting colors; straight, angular lines
Chamorro-Premuzic et al., 2010	simple painting with happy subjects	more complex paintings; paintings with troubling content
Palumbo et al., 2015	curved shapes	angular shapes
Lieven et al., 2015	slender and round logos; round typefaces  <i>Edely</i>	heavier, angular logos; bold, angular typefaces  Bloyt

Based on theory, especially selectivity hypothesis (see section 3.1), and past empirical results, this work posits that, while viewing stimuli such as typefaces, logos, and product design, females are more likely to see the connections among the various elements of the

design and assess higher-order factors such as harmony as more attractive than males. Males on the other hand are more likely to be attracted to one or a few of the design elements or features and will heuristically assess their value as it relates to themselves. In other words, respondent sex moderates the harmony-attractiveness relationship such that designs low in harmony will be evaluated as more attractive by males rather than females, whereas designs high in harmony will be evaluated as more attractive by females rather than males. Therefore:

H4: Respondent sex and design harmony will interact to influence attractiveness such that females (males) will find harmonious (unharmonious) designs more attractive.

I test this hypothesis in both Study 2 and Study 3 along with exploring if there is a main effect of harmony on attractiveness (H2).

3.3 Biological and Social Factors

“The reasons for a preference of symmetry are not fully understood.”

(Hekkert & Leder, 2008, p. 263)

Relating to why this interaction effect might occur, two streams of research have examined gender differences in consumer behavior, one focusing on **biological factors** (e.g., Cela-Conde et al., 2009; Meyers-Levy, 1989) and the other on **social factors**, specifically gender identity (e.g., Fischer & Arnold, 1990; Jaffe & Berger, 1988).

Sex is commonly defined as “the biological characteristics that distinguish males and females, such as reproductive organs and chromosomes” (Howard & Hollander, 2000, p. 9). As such, sex is typically considered a binary concept where an individual is categorized as either male or female (although recent changes in federal and state laws provide for a third category, labeled “neutral” or “intersex”). In contrast, gender identity can be defined as the degree to which an individual views him- or herself as masculine or/and feminine (Palan, 2001). Contrasting biological sex in its dimensionality, gender identity represents a two-dimensional concept, with one dimension capturing feminine personality traits (e.g., empathetic and nurturing) and the other capturing masculine traits (e.g., dominating and self-centered). Sex and gender identity are thought to be closely linked (Johnson & Repta, 2012), but gender identity is not fully determined by sex, because not all males are masculine and not

all females are feminine. Instead, individual identity is shaped by people's life, their experiences, and social environments (Patterson & Hogg, 2004). Yet, most males adopt a masculine, "agentic" identity and most females adopt a feminine "communal" identity (Meyers-Levy & Loken, 2015). Regardless of the type adopted, gender identity is a core component of a person's self-concept (Feiereisen et al., 2009).

Biological factors

Both biological gender and gender identity have been studied as determinants of consumers' response to marketing stimuli. Representing one of the most fundamental demographic variables, sex is pervasive in social and behavioral research. Consumer researchers are especially interested in understanding how and why males and females differ in their reactions to marketing stimuli (Moss, 2009), because corresponding insights are highly informative for marketing practitioners in successfully devising strategies (Wolin, 2003). Past research offered a number of biological explanations for sex effects (such as sex chromosomes, sex hormones, and brain lateralization) (Putrevu, 2001). This section presents literature on differences in brain activity and processing abilities. After an evolutionary perspective, social factors are described in detail.

Brain activity

Males tend to be more locally efficient in their right hemisphere networks, whereas females tend to rely more on their left hemisphere (Tian et al., 2011). For example, females activate the left prefrontal cortex more than males, suggesting a greater degree of executive processing and language-based decoding. Females also exhibit greater activation of mesolimbic regions, including the nucleus accumbens, implying greater reward network response and possibly less reward expectation. These results indicate sex-specific differences in neural response to, for example, humor (cartoons) with implications for sex-based disparities in the integration of cognition and emotion (Azim et al., 2005). Furthermore, sex-related functional asymmetry of the amygdala may entail functions such as social conduct, emotional processing, and decision-making, a finding that in turn could reflect differences in the manner in which males and females apprehend, process, and execute emotion-related information (Tranel & Bechara, 2009). The amygdala is an emotion-related structure that is important for the detection and recognition of emotional facial expressions, for the processing of social information more generally, and for the enhancement of memory by emotion. In

sum, females have been credited with relatively more left-lateralized language and emotion processing, whereas males often tend toward right-lateralized visuospatial activity. One factor creating these differences in brain structure may be hormones (Moss, 2009). Furthermore, male hemispheres are more lateralized than those of females who tend to process bilaterally (Meyers-Levy & Loken, 2015).

These differences in brain-based processing are further evident in males' and females' evaluation of visual attractiveness (Cela-Conde et al., 2009) with activity in the parietal region being bilateral in women and lateralized to the right with men when participants judged the stimuli as beautiful.

In general, the sequential components of visual processing can be classified as

- **early** (simple elements such as color and shape, occipital regions)
- **intermediate** (elements are grouped together to form a coherent unit, frontal parietal attentional circuits)
- **late** vision (evokes memories, objects are associated with meaning) (Chatterjee, 2010).

To date, it is unclear in which phase exactly sex differences occur. According to Cela-Conde et al. (2009), there are no sex differences in brain activity during the initial 300 ms (early vision), whereas during the 300- to 700-ms interval (intermediate vision), results show significantly different activity between the sexes in parietal regions when participants judged the stimuli as beautiful. As presumed, activity in this region was bilateral in females, whereas it was lateralized to the right hemisphere in males.

Differences in stimulus processing

This section extends the selectivity hypothesis introduced in section 3.1 by integrating the link to sex differences in response to visual harmony. As already mentioned, examining sex differences in response to advertisement visuals, Meyers-Levy (1989) established that females tend to process incoming data more comprehensively, aggregating single elements into a fuller picture by elaborating their interrelationships. In contrast, males appear to be more selective data processors relying on specific elements that are relevant to the self (Darley & Smith, 1995). Linking these differences in information processing with social factors, females were assigned a relatively subordinate and communal role, which heightened their motivation to notice and understand subtle cues, whereas males traditionally occupied a relatively dominant and agentic position which is more self-focused and did not call for increased attention to details in one's interpersonal environment (Meyers-Levy & Loken, 2015).

Given the holistic nature of the harmony factor, these findings imply the effects may extend to responses to visual harmony. Adopting this perspective, possible explanation for sex differences in response to design harmony could be rooted in fluency experiences. Fluency describes the subjective experience of ease or difficulty associated with processing a stimulus (i.e., design) (Reber et al., 2004). Research on visual harmony shows that scanpaths of individuals looking at distorted and unbalanced paintings revealed more eye movements (saccades) and less fixations than scanpaths of individuals looking at harmonious paintings. Furthermore, disharmony (distorted and unbalanced elements) in paintings led to lower preference ratings, especially among untrained viewers (Locher, 2006). An interpretation of these findings could be that an observer tried to detect balance and order in the distorted composition, leading to more difficulty in processing (i.e., lower fluency experience) and less liking. Because males use superficial cues and base their evaluation on these (selective processors), whereas females attempt to assimilate all available visual information rendering judgment (comprehensive processors), the fixation duration of males is longer than that of females (Meyers-Levy & Loken, 2015). This could lead to an easier fluency experience and therefore to higher attractiveness evaluation of visual disharmony. The interaction between respondent sex, visual harmony, and fluency will be discussed in greater detail in section 3.4.1.

Evolutionary point of view (good genes hypothesis)

Research on the positive effect of symmetry as an important part of design harmony (see section 2.3) highlights evolutionary factors as possible reasons for this effect.

According to Grammer and Thornhill (1994), preference for symmetry is a product of sexual selection. Both sexes view symmetry in opposite-sex individual faces as attractive. Furthermore, individual male faces are more attractive to women than composite male faces. This effect is based on the argument that symmetry indicates a healthy development and therefore is an indicator of positive genetic make-up (Thornhill & Gangestad, 1993). In sum, from an evolutionary standpoint, attractiveness and symmetry have been linked to fertility and gene quality (van Gorp & Adams, 2012). But this holds true for both males and females and only for visual symmetry. Consequently, the evolutionary perspective may not serve as an explanation why sex differences in response to visual harmony occur.

Social factors

Gender identity

Different than the substantial body of research on sex, only a few studies have focused on gender identity as an influencer of design evaluation. In line with identity theory, illustrating that an identity is formed through the process of self-identification (Stets & Burke, 2000), gender identity is a multifaceted psychological construct which is characterized by an individual's self-attribution of masculine and feminine personality traits. Furthermore, it can vary between and among females and males. An individual who identifies primarily with feminine traits is feminine, with masculine traits is masculine, and with both sets of traits is androgynous (Fischer & Arnold, 1990). Moreover, it is socially constructed and may develop and change across an individual's life cycle (Palan, 2001). Other gender concepts which are relevant to the self such as gender roles and gender schemata often affect one's gender identity. For example, the existence of consensually validated norms and beliefs about what behaviors are appropriate for males and females can have a direct impact on the construction of gender identity (Ashmore & Del Boca, 1986). Pointing out behavioral consequences, gender identity – as a crucial component of the self-concept – is determined by both an individual's own behavior and the behavior of the reference group to which the individual refers. More precisely, the behavioral enactment of gender identity includes, amongst other things, preferences for specific objects (Ashmore & Del Boca, 1986). In a marketing context, consumers refer to their gender identity, when they encounter marketing stimuli, continuously monitoring and adjusting their behavior and consumption practices (Escalas & Bettman, 2005), and generally behaving in agreement with their identity (Oyserman, 2009).

It is important to note that, to date, society and research typically only recognize biological sex (i.e., male or female) as the only category our world relates to when it comes to gender.

However, gender identity is thought to be a key factor in consumer behavior (Putrevu, 2001). For instance, a communal feminine identity relates positively to involvement in Christmas gift shopping for both men and women (Fischer & Arnold, 1990). Yet, little attention has been given to the relationship between gender identity and design response. Initial studies (e.g., Debevec & Iyer, 1986; Milner & Fodness, 1996) have focused on the gender-image of select product categories. Others acknowledge that most brands and products have a gender identity, being either feminine (e.g., soap) or masculine (e.g., car) (Debevec & Iyer, 1986). Tilburg et al. (2015) suggest that consumers draw from specific design elements

(such as form, color, or material) as the underlying basis for perceiving such product gender. Given the symbolic meaning of visual design, gender identity, one of the central components of the self, has a strong influence on symbolic consumption with masculine consumers preferring objects perceived as masculine (Patterson & Hogg, 2004). Feminine respondents, on the other hand, prefer more feminine marketing visuals (Meyers-Levy & Loken, 2015; Worth et al., 1992). Taken together, social explanations for differences in response to visual appearance seem to be rooted in the concept of gender identity, especially its congruity with visual design. In line with this thinking, Sirgy (1982) suggested that gender-typed product images may activate corresponding gender self-schemas which then influence the value placed on goods and their attributes.

Over the past decades, significant changes have occurred in traditional gender roles with females becoming stronger and more dominant due to their entrance into male-dominated professions. Likewise, males show more interest for products previously associated with females (e.g., cosmetic products) and become more sensitive and caring (Fugate & Phillips, 2010). Therefore, it may be beneficial to acknowledge that males and females can have different but also convergent experiences and traits. This is why consumer research should not only focus on biological factors but also on social factors (i.e., gender identity) in order to explain response to design evaluation.

Some researcher pointed out that social, biological, and evolutionary factors work together (see Figure 7): For example, estrogen can stimulate not only the female brain circuits, but also communication, gut feelings, and caring personality traits which in turn can have consequences for the perceiving and processing of stimuli (Moss, 2009).

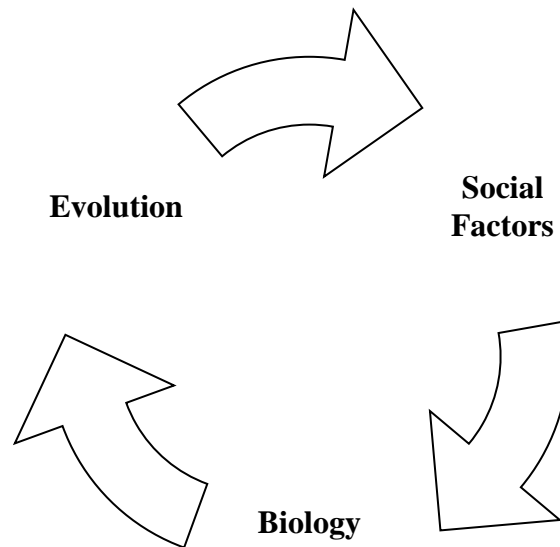


Figure 7: A model integrating social and biological factors in differences between male and female design preferences

This integrative model is in line with recent research on gender differences. According to Meyers-Levy and Loken (2015), four major complementary theories have been proposed to explain why gender differences in consumer behavior may occur. The first theory proposes that physical differences (e.g., size, strength, child-bearing capability) led males and females to adopt different social roles that further gave rise to orientations of agency and communion. These cultural beliefs and orientations have now been perpetuated over time. The second theory is evolutionary and informs the first one by proposing that our early ancestors evolved adaptations in response to environmental challenges and these changes manifest themselves today in people's behavior. The third theory enhances the plausibility of the previous two theories by highlighting the differing hormonal makeup and brain processes of the sexes. Finally, the selectivity hypothesis, a culmination of the previous theories provides an account of sex differences in information processing (see Meyers-Levy & Loken, 2015, for a detailed review).

This is why this research focuses on influences of both sets of factors by examining the effect of the more biological-oriented mechanism of processing fluency (see section 3.3.1) as well as the more social-oriented mechanism of self-congruity (see sections 3.3.2). In addition, it discusses the moderating role of both biological gender and social gender identity (see section 3.4).

3.3.1 The Mechanism Involving Fluency

“Reading a symmetrical object is much easier than reading asymmetrical ones.”

(Hekkert & Leder, 2008, p. 263)

How does visual harmony influence attractiveness evaluation? In general, only a few studies have explored the reasons why differences in attractiveness evaluation should occur. I offer processing fluency as possible mediator of the relationship between visual harmony and attractiveness.

In general, fluency can be defined as the ease or difficulty with which a stimulus is accessed, retrieved, or processed. It affects judgments and preferences. In other words, stimuli which are processed fluently elicit a positive affect towards the stimuli (Schwarz, 2004). Processing fluency can be divided into two major conceptualizations: perceptual fluency (i.e., the ease with which a person perceives a stimulus' characteristics) and conceptual fluency (i.e., the ease with which a subject produces associations). In line with fluency research, the more fluently perceivers can process an object, the more positive is their aesthetic response (Reber et al., 2004; Schwarz, 2004; Winkielman & Cacioppo, 2001).

Linking processing fluency indirectly with holistic visual harmony, literature on design elements attributes the preference for visual symmetry to the fact that our visual system processes symmetry efficiently. Specifically, the fluency hypothesis says that individuals' preferences for symmetry are due to the positive affect engendered by processing fluency. Indeed, Reber et al. (2004) argue that the specialty of symmetric objects is that they contain less information and are easier to process (Pecchinenda et al., 2014). In addition to the harmony variable symmetry, among the most prominent influencers of fluency are the design characteristics unity, balance, contrast, and certain proportions such as the golden section (Schwarz, 2017).

As a consequence and linking processing directly with visual harmony, 'reading' a harmonious object (e.g., symmetrical) should be much easier than reading unharmonious ones. Eye-tracking studies on paintings (low versus high in visual harmony) which show that observers experience more metacognitive difficulties while viewing unharmonious paintings support this presumption (Locher, 2006). Thus, an important part of harmony preference might be due to ease of processing (Reber et al., 2004). Because visual harmony is easier to

process, viewers find them more attractive than visual disharmony (Winkielman et al., 2006). Table 5 gives a literature overview on the positive effect of processing fluency. Therefore:

H5: Processing fluency will mediate the positive effect of visual harmony on attractiveness.

Furthermore, many researchers assume that processing fluency (and thus visual appeal) does not only depend on stimulus features but also on a number of perceiver variables, for example their art education and knowledge related to the visual (Schwarz, 2017). Due to females' and males' differences in stimulus processing, perceivers' biological gender might have an influence as well. Section 3.4.1 offers more details on the moderating effect of respondent sex on the harmony-fluency-attractiveness relationship.

Table 5: Literature overview on fluency research

Study (empirical)	Independent variable	Dependent variable	Stimuli	Key findings
Pocheptsova et al., 2010	Metacognitive difficulty (and consumption domain: every day vs. special occasion)	Purchase intention	Cheese	Metacognitive experiences of difficulty when evaluating special-occasion products can enhance the products attractiveness by affecting perceptions of its exclusivity.
van Rompay & Pruyn, 2011	Shape/typeface congruence	Brand credibility, price expectations (partly mediated through perceived brand aesthetics)	Bottled water	Study 1: positive effect of meaning congruence (= high processing fluency) on brand credibility and price expectations; Study 2: positive congruence effects, effect of congruence on price expectations is mediated through brand aesthetics.
Winkielman & Cacioppo, 2001	Fluency	Affective response (indirect measure)	Pictures of everyday objects	Processing fluency is associated with stronger electromyographic activation of the zygomaticus major ("smiling muscle").
Winkielman et al., 2006	Prototypicality (fluency as a mediator)	Attractiveness	Dot pattern	Prototypicality is a predictor of both fluency and attractiveness, fluency mediates the effect of prototypicality on attractiveness.
Study (conceptual)				
Reber et al., 2004	Aesthetic evaluation is positive associated with processing fluency. Symmetry and figure-ground contrast are variables that facilitate fluent processing.			
Schwarz, 2004	A growing body of research demonstrates that any variable that facilitates fluent processing is likely to increase liking.			

3.3.2 The Mechanism Involving Self-Congruity

“Like attracts like.”

(Moss, 2009, p. 75)

Another more social-oriented research stream focused on self-congruity as a possible explanatory mechanism. Linking the view individuals hold of themselves with visual design, design conveys symbolic and self-expressive value to consumers (Bloch, 2011; Kumar & Noble, 2016) which can be defined as a “perceived message a product communicates regarding a consumer’s self-image to both the consumers and others on the basis of visual elements” (Homburg et al., 2015, p. 44). According to this view, marketing visuals can serve as cues to symbolically position oneself in line with self-congruity (Sirgy, 1982) and cognitive consistency theories (Festinger, 1957; Heider, 1946). At the heart of cognitive consistency theories (Festinger, 1957; Heider, 1958; Osgood & Tannenbaum, 1955) is the idea that individuals are motivated to avoid conflicting psychological experiences and maintain cognitive consistency in their beliefs and behaviors. Achieving cognitive consistency in general (Swann & Read, 1981) and identity consistency in specifics (Roberts & Donahue, 1994; Suh, 2002) is crucial for maintaining psychological well-being and to keep a positive view of our self. For example, according to Moss (2009), congruity between the self and relevant others seems to play an important role in terms of social relationships. This self-selecting tendency is widely recognized and it describes in which individuals are attracted to other individuals similar to themselves (also known as matching hypothesis or similarity attraction). Personality seems to play an important part in shaping social preferences and if the personalities of those interacting are alike then the relationship will prosper. Kirton and McCarthy (1988), for example, found that people work well in environments in which their own cognitive patterns are matched by those of people around them (= cognitive fit).

In commercial contexts, self-congruity effects have been reported for consumers establishing and maintaining close bonds with brands whose personalities are consistent with consumers’ self-concept (Escalas & Bettman, 2003). The same applies for product choice. Van den Hende and Mugge (2014) confirm that consumers prefer products that are congruent with their self-concept, while they avoid those products that are incongruent. Because an ability of a product is to communicate a favorable self to relevant others, individuals respond favorably to products that are associated with their own traits and personality characteristics

leading to a stronger bonding (Hassenzahl, 2008). According to van den Hende and Mugge (2014), congruity between gender of the product and consumer's gender plays an important role in influencing their consumption behavior on various ways.

In terms of design preferences, the question is whether individuals use self-reference criteria in the context of aesthetic evaluations as well. A few earlier studies examined the design preferences of subjects with different personality traits (e.g., Knapp & Green, 1960). For example, Honkavaara (1958) found that people who are realistic and socially secure prefer realistic pictures, whereas people who internalize their feelings and are affectionate show a preference for poetic pictures (as an expression of an emotional personality). These studies show that there may be a 'like attracts like' direction, called a self-congruity tendency, suggesting that individuals with specific personality traits favor design with similar personality to their own.

In summary, just as the symbolic properties of brands and products allow them to appeal to the self by projecting meaning (Aaker, 1996), I expect the visual properties of marketing stimuli to function in similar ways. I base this expectation on self-congruity effects demonstrated with brands and products (Kressman et al., 2006), and for visual design (van Rompay & Pruyn, 2011). Specifically, I expect that visual harmony in design stimuli (such as typefaces, logos, and products) may be associated with impressions of femininity, agreeableness, friendliness, and peace, whereas a lack of harmony may be associated with masculinity, individuality, toughness, and aggressiveness (Pittard et al., 2007). For example, Jiang et al. (2016) found that circular logo shapes are associated with softness and angular logo shapes are associated with hardness. Because consumers are strongly motivated to maintain and protect their self (Baumeister, 1986), consumers should respond more positively to marketing visuals that are congruent with salient aspects of their self (Sung & Choi, 2012; Wheeler et al., 2005). In other words, when a visual design is more congruent with a person's self, s/he will evaluate the design as more attractive. Therefore:

H6: Congruity between the self and the visual will mediate the positive influence of harmony on attractiveness evaluation.

3.4 Moderating Role of Gender Identity in Contrast to Biological Gender

“That sex roles are changing in our society should be sufficient for the marketer to become less interested in the male-female dichotomy and more interested in the level of masculinity or femininity.”

(Gentry et al., 1978, p. 329)

Marketing managers often treat sex and gender identity as synonyms. Similarly, marketing researchers assess gender differences in reaction to marketing stimuli in terms of the biological distinction between females and males, thereby overlooking the potential impact of gender identity on consumer response (Wolin, 2003). Sex is typically considered a binary concept where an individual is categorized as either male or a female based on biological characteristics, such as reproductive organs and chromosomes (Howard & Hollander, 2000). In contrast, gender identity can be defined as the degree to which individuals view themselves as masculine or feminine based on personality traits (Palan, 2001). Hence, males and females can possess both masculine and feminine traits. The above discussion (see section 3.3) suggests that it may be beneficial to acknowledge that males and females can have different but also convergent experiences and traits. Furthermore, given that in modern day society the traditional agentic-communal roles of males and females are getting increasingly blurred, with the definition of gender slowly changing from biological gender to gender identity, it is important to explore if the results obtained for sex hold with gender identity and in which (marketing) context it make sense to focus on biological gender or on social gender identity.

3.4.1 Moderating Effect of Biological Gender on the Harmony-Fluency-Attractiveness Relationship

“From this perspective, visual appeal does not reside in attributes of the object of appreciation but in the processing experience of the perceiver: an object is appealing when it is fluently processed, which is a function of stimulus, perceiver, and context variables.”

(Schwarz, 2017, p. 16)

This section highlights the influence of biological gender on the hypothesized indirect effect of visual harmony on attractiveness evaluation through processing fluency (see section 3.3.1). The moderating effect is assumed to be based on sex differences in visual information processing, and, therefore, outlines a biological explanation for sex effects. The selectivity hypothesis (Meyers-Levy & Loken, 2015) proposes that females and males have differing processing abilities in that “compared to males, females tend to process incoming data more comprehensively, and they possess a lower threshold at which they apprehend information (Meyers-Levy & Loken, 2015). Females are also more likely to detect, and connect data that may be more distally relevant information when forming assessments. Males, on the other hand, are more selective data processors, rely more on less effortful heuristics, and look for cues that relate to themselves.

Females also favor fluency in incoming data, and are able to organize the objects in their immediate visual field (smaller area) more efficiently by using a marking strategy and connecting the objects together. Males on the other hand are more adept at an orientation strategy that involves creating global markers (involving a larger area) like the sun or Euclidean (e.g., east, west) cues. This is why males are better than females navigating roads and other larger geographical areas as opposed to females who are better at finding and locating things in smaller places such as inside a home (Meyers-Levy & Loken, 2015).

Based on these theoretical bases and past empirical results I posit that, while viewing stimuli such as typefaces, logos, and product design, females are more likely to see the connections among the various elements of the harmonious design (comprehensive processors), probably resulting in less eye movements and shorter fixation duration needed to assess higher-order factors such as harmony (Meyers-Levy & Loken, 2015) than males. This could lead to an easier fluency experience and therefore to higher attractiveness evaluation of

visual harmony. In the case of visual disharmony, males on the other hand are more likely to be attracted to one or a few of the design elements or features (selective processors) with consequences for number of saccades (less eye movements for males than for females), fixation duration (shorter for males than for females), fluency experiences (higher for males than for females), and attractiveness evaluation of visual disharmony (higher for males than for females). Females seem to try to detect balance and order in visual disharmony, leading to difficulty in processing. Contrary to this assumption, Djamasbi et al. (2007) found no significant gender differences in fixation (stares longer than 300 ms) in terms of processing small windows with information on websites differing in visual harmony.

Nevertheless, this work argues that fluency experiences can account for different responses of males and females from a biological point of view. Another stream of research suggests that differences in responses are due to different attitudes towards fluency in general. Erz (2011) hypothesized and found that females respond more favorably and show higher purchase intention towards a product presented in an advertisement high in fluency (versus low in fluency), whereas males respond more favorably and show higher purchase intention towards a product presented in an advertisement low in fluency (versus high fluency). Consequently:

H7a: Respondent sex will moderate the indirect effect of visual harmony on attractiveness evaluation through fluency such that the mediating effect of fluency will be stronger with females than with males.

H7b: Gender identity will not moderate the indirect effect of visual harmony on attractiveness evaluation through fluency.

3.4.2 Moderating Effect of Gender Identity on the Harmony-Self-Congruity-Attractiveness Relationship

“Individual differences have emerged in how important congruence between a product and one’s self is in consumption decisions.”

(Fugate & Phillips, 2010, p. 252)

Only a few studies in the leading marketing and consumer behavior journals have explored gender identity (as opposed to sex) as a variable of interest. For example, Fischer and Arnold (1990) show that a communal feminine identity relates positively to involvement in Christmas gift shopping for both males and females. Vitz and Johnston (1965) found that, within each sex, an individual’s masculinity (femininity) is positively related to the masculine (feminine) image of the cigarette smoked. In line with this findings, Fry (1971) demonstrated that more feminine males show more preference for cigarettes that were classified as being less masculine.

Other studies have focused on the gender-image of select product categories in that most brands and products have a gender identity, being either feminine or masculine (Debevec & Iyer, 1986). As a consequence, consumers prefer products having a gender-image that is congruent with their views of themselves over products that are described in gender-discrepant terms (van den Hende & Mugge, 2014). Summarizing, it is concluded that gender identity-congruity influences consumers’ consumption behavior in several ways (e.g., positive attitude toward the product that is highly congruent with the self-concept). Van den Hende and Mugge (2014) show that for both males and females gender-congruity positively affects product evaluation. But they focus only on biological gender instead of gender identity. The authors indicate that it would be interesting to future research to investigate how gender-image affects product evaluation with consumers scoring high versus low on a particular gender identity. Grohmann (2009) shows similar but more gender-identity focused results for brands. Congruity between masculine and feminine brand personality and consumers’ sex role identity positively influences affective, attitudinal, and behavioral brand-related consumer responses. Linking gendered images of brands and products with visual design, Tilburg et al. (2015) suggest that consumers draw from specific design elements (such as form, color, or material) as the underlying basis for perceiving such product gender. Patterson and Hogg (2004) confirm that gendering a product can be achieved on a symbolic level by manipulating the gender connotations of the product (or packaging). Hence, design elements such as colors,

patterns, and shapes of objects contribute to the gendering of a product. Important is that all of the cues must be consistent with the desired gender identity (Patterson & Hogg, 2004).

Yet, scant attention has been given to the relationship between gender identity and design preference in marketing and consumer research. Gainer (1993), for example, shows a positive effect of feminine identity on involvement in the arts, whereas biological sex has no more than an indirect effect.

Given the symbolic meaning of visual design, gender identity, one of the central components of the self, has a strong influence on symbolic consumption with masculine consumers preferring objects perceived as masculine (Patterson & Hogg, 2004). Feminine respondents, on the other hand, prefer more feminine marketing visuals (Meyers-Levy & Loken, 2015; Worth et al., 1992). Taken together, social explanations for differences in response to visual appearance appear to be rooted in the concept of gender identity, especially its congruity. In line with this thinking, Sirgy (1982) suggested that gender-typed product images may activate corresponding gender self-schemas which then influence the value placed on objects and their attributes.

To point out the important role of gender identity as a central component of the self-concept, Gould (1996) introduced two paths of gendered consumer behavior:

Path 1: Gender Identity → Gender-Based Need Arousal → Gendered Response
(person-trait path)

Path 2: Gender Salience → Sex Role Definition → Gendered Self-Attribution
(situational path)

Path 1 illustrates that an individual's gender identity, as part of the self-concept and manifested in one's self-image, leads to gender-based need arousal and then results in gendered response. According to Burke (1989), Path 1 is also associated with self-congruity through which "people choose behaviors that have the same meanings as their self-meanings or identities; people with more feminine identities, for instance, choose more feminine behaviors, when possible, and avoid more masculine behaviors" (Burke, 1989, p. 161). Apart from explaining between sex differences, this theory also looks within sex and suggests that various gendered attitudes and behaviors may occur across the sexes. Therefore, Path 1 can be viewed as both a between and a within sex model of gender identity effects (Gould, 1996). The focus of Path 2 is on the concept of gender salience which emerges situationally. This means that he or she is actually redefining him or herself in the situation. The influence of the situational context on gender effects will be clarified in section 4.4.

In sum, I expect that gender identity as a specific and central component of the self will interact with a design's visual harmony to influence self-congruity. Visual harmony can evoke very specific viewer associations in terms of personality (Pittard et al., 2007). Because individuals generally seek congruity in their lives, visual harmony should resonate with personality traits that are in some way reflective (Sirgy, 1982). Because gender identity is considered a core factor in an individual's identity (Feiereisen et al., 2009), and is based on masculine and feminine traits that closely resemble elements of visual harmony (Palan, 2001), I expect that gender identity moderates the indirect effect of visual harmony on attractiveness through self-congruity. Moreover, given evidence that sex alone cannot explain complex gender phenomena (Wolin, 2003), I further expect that gender identity (as opposed to sex) will be a superior predictor in this regard.

I base this prediction on reports that both males and females develop gender identities for themselves and for marketing objects, and are psychologically uncomfortable adopting or using products not identity congruent (Ward & Broniarczyk, 2011). Instead consumers use material objects to symbolize their own gender identity (Patterson & Hogg, 2004). In addition, congruity between consumers' gendered self-image and the gendered personality of marketing objects leads to positive attitudes (Feiereisen et al., 2009) and to a tighter relationship (Grohmann, 2009).

In the present context, visual harmony should appeal more to individuals with a more rather than less feminine identity as harmony including its associations should be more congruent with females' tendency to seek harmony in their relationships, to conform and assimilate, and to compromise. In contrast, individuals with a masculine identity should respond more positively to visuals low in harmony, in line with their tendency to confront, to contrast themselves from others, and to stand out from the crowd. Therefore:

H8a: Gender identity will moderate the indirect effect of visual harmony on attractiveness evaluation through self-congruity such that the mediating effect of self-congruity will be stronger with a more feminine identity.

H8b: Respondent sex will not moderate the indirect effect of visual harmony on attractiveness evaluation through self-congruity.

3.5 Summary and Relevance for the Empirical Studies

According to the literature review, research on sex differences in visual design is rare. Instead, numerous authors focused on areas such as gender role stereotypes, selectivity hypothesis, spokesperson gender, gender advertising response, and gendered image of products and brands. Identifying gender differences in these areas and linking them to possible difference in response to visual harmony is one goal of this dissertation.

Furthermore, the present empirical studies aim to close the research gap on differences in how females and males respond to harmony in visual design, specifically, their evaluation of attractiveness. Practitioners may find the insights useful not only for creating designs that appeal to a specific sex, but perhaps more so for creating designs that simultaneously appeal to both groups.

Moreover, it remains unclear as to why these findings occur. Specifically: Why should differences in attractiveness evaluation occur? Why should females evaluate harmonious designs as more attractive than males (and vice versa)? What are the underlying mechanisms? Is it biological gender or gender identity causing effects? The majority of marketing studies evaluates the effect of gender as the biological distinction between females and males. However, other possible factors exist including gender identity (Betz et al., 1989), agreeableness (Schmitt et al., 2008), or CVPA (Bloch et al., 2003).

This present work tries to answer these questions in a series of studies. Study 2 tests the interactive effect of respondent sex with a design's visual harmony on attractiveness (H4). Study 3 was designed to replicate the moderating effect of respondent sex on the relationship between harmony and attractiveness and to test if the moderating effect prevails when other personality traits (i.e., CVPA and agreeableness) are controlled for. Both Study 4 and Study 5 extend previous studies by focusing on fluency (see section 5.3 for Study 4) and self-congruity (see section 5.4 for Study 5) as mediators (H5 and H6) and by exploring the role of respondent sex as opposed to gender identity (H7 and H8).

The last point is of particular importance, because gender is a very complex construct. Gender identity representing a segmentation variable that may be more relevant in today's gender-blurring environments, potentially offers a mechanism for a more refined understanding of the intersection between sex, gender identity, and symbolic consumption. Hence, especially in the case of self-congruity theory, gender identity – more than biological sex – could influence the evaluation of design harmony.

4 The Role of Social Expectations in Gendered Responses: Implicit Associations and the Influence of Situational Context

After defining the concept of implicit associations, this chapter introduces the implicit association test (IAT) (section 4.1) and highlights the dissociation between results obtained by explicit and implicit measures which could be traced back to the influence of social desirability and social expectations in self-report measures.

First, this chapter summarizes empirical results of the most significant studies focusing on implicit associations. Here, the emphasis is placed on research in gender stereotypes (section 4.2) and consumer behavior (consumer, marketing, and design research, section 4.3).

Second, section 4.4 reviews key findings pertaining to the role of social expectations in gendered (design) responses, hereby highlighting the influence of public versus private consumption situations. A summary and the relevance for the empirical studies are presented in section 4.5.

4.1 Implicit Associations and their Assessment

“Recent theories in social psychology assume that people may have two different attitudes toward an object at the same time – one that is explicit and corresponds with deliberative behavior, and one that is implicit and corresponds with spontaneous behavior.”

(Frieze et al., 2006, p. 727)

Greenwald and Banajii (1995, p. 5) defined an implicit construct as “the introspectively unidentified (or inaccurately identified) trace of past experience that mediates R” where R refers to the category of responses (e.g., evaluative outcomes). These constructs which influence feelings, thoughts, actions towards an object, and evaluative outcomes can include implicit attitudes, beliefs, stereotypes, self-concepts, and self-esteem (Greenwald & Banajii, 1995). In 2000, Wilson et al. introduced the dual attitude approach and proposed that an individual’s initial attitude towards an object is automatically retrieved, although salient aspects of the context impact the formation of a response. In other words, individuals may have two attitudes representing different evaluations of the same object at the same time – one

that is explicit and one that is implicit. While implicit constructs (e.g., associations) are activated automatically, explicit ones require more capacity and motivation to retrieve from memory. Moreover, on the one hand, implicit associations are able to reveal automated processes and information which are not available, even if individuals were motivated to express them (e.g., unreachable memories). On the other hand, implicit associations are able to reveal information which individuals might explicitly reject due to conflicts with values and beliefs or negative social consequences (e.g., smoking behavior, gender stereotypes). However, both explicit and implicit constructs can coexist towards the same stimulus (Wilson et al., 2000). Important to note is that, according to Friese et al. (2006), a certain level of dissociation between conscious constructs and their nonconscious, implicit variants exists. These differences have direct relevance for the subsequent behavior, and therefore an accurate understanding of the implicit-explicit construct distinction is conceptually critical (Friese et al., 2006).

Taken together, although different definitions of implicit or automated associations have been proposed, for the present work, implicit associations are defined as constructs that (a) have an unknown origin (i.e., individuals are not aware of them), (b) are activated automatically, and (c) influence uncontrolled responses.

Recent research in social psychology - and by extension in consumer psychology and marketing - has begun to focus intensively on implicit constructs. To be more precise, in the mid-20th century, marketing researchers assumed that consumers make choices consciously and rationally. In the 60's, it became clear that this assumption required modification due to more available evidence indicating that consumers' behavior is not the consequence of entirely rational cognitive processes, particularly in the case of fast moving consumer goods (FMCG). Instead automatic affective processes and motives that exist outside of conscious awareness and control needed to be taken into consideration in understanding consumer behavior (Brunel et al., 2004; Maison et al., 2001). Consistent with these findings, Dimofte (2010) suggests that while the use of implicit measures in consumer research is still in its infancy, they seem to play an increasingly important role as a methodological tool in order to understand consumer behavior, and in particular consumers' mental states. To be more precise, and of greater importance for the present thesis, implicit measures help to achieve a better understanding of the way consumer process and respond to marketing stimuli. Fitzsimons et al. (2002) reviewed accumulating evidence for the enhanced role of nonconscious influences on consumer responses ranging from perception and memory to

affect and choice. According to the researchers, while explicit measures emphasizing conscious and thorough information processing are unable to account for a vast majority of consumer choices, implicit measures would seem to be potentially useful tools for detecting consumers' responses that emerges quickly and spontaneously. Consequently, implicit measures offer the opportunity for researchers to avoid socially acceptable answers and to provide quantifiable insights into the underlying automatic processes of consumers. These insights are particularly important for marketing managers to understand the behavior of their customers.

A possible way of measuring nonconscious and automated emotions and cognitions is the use of reactions times (serves as an indicator for implicit associations). A methodological excursus introducing the implicit association test (IAT) as a powerful instrument is presented in the following.

Methodological Excursus

Explicit measures rely on individuals' self-reported assessments of specific attributes or their intentions regarding potential behaviors and choices they face. Hereby, responses are often registered on Likert scales, by means of which individuals select numerical values to express the degree to which they possess an attribute or plan to engage a particular behavior (Dimofte, 2010). The main problem with using explicit measures (e.g., by questionnaires or interviews) is their premise that study participants have already formed an opinion, are aware of it and their own identity, and are willing to share both of them. In contrast to explicit measures which primarily predict deliberate and controlled behavior, implicit measures predict automatic behavior (without conscious monitoring). Past research has shown the IAT to be a powerful and flexible procedure for assessing these non-conscious and automated thoughts, attitudes, beliefs, and personality traits (Greenwald et al., 1998), hence avoiding the limitations associated with explicit measures. In other words, the IAT was developed to measure relative strength of automatic associations between constructs such as attitudes, stereotypes, and self-concept and to explore relationships among these constructs from a non-conscious perspective (Brunel et al., 2004).

In contrast to explicit measures, the advantage of the IAT is that it allows to reduce the role of self-reflective and deliberate processes. Although related, the two types of measures seem to stem from different information processing streams and appear to be linked to activations in different regions of the brain. As a result, sometimes the correlation between

explicit measures and IAT can be quite high, but in most cases, it is low and not significant. For example, Maison et al. (2004) found that IAT measures correlate only weakly with self-report (explicit) measures of the same associations. The authors assumed that these low correlations, or dissociations, are explained either by participants' limited willingness to report socially sensitive attitudes and beliefs, or by limited introspective knowledge of the strengths of the associations assessed by the IAT. Still, the divergence of the constructs creates the potential for implicit and explicit measures to complement each other in predicting behavior (Brunel et al., 2004).

Procedure

To provide a better understanding of the underlying processes of the IAT, the entire procedure will be presented next. No et al. (2014) summarize that, in an IAT, participants are instructed to respond as rapidly and accurately as possible to a series of target stimuli, using two response keys. By now, a large body of empirical research has demonstrated that participants' response latencies tend to be faster when two stimuli assigned to a given response key are associated with one another (congruent), as compared to the response latencies seen in those conditions in which unrelated stimuli (incongruent) are assigned to the same response key.

Table 6 presents a diagram describing a typical IAT design for the assessment of association strengths between categories of harmony and disharmony and attributes of attractive and unattractive. The IAT consists of seven blocks. In the first block, participants see harmonious and unharmonious pictures (e.g., the yin and yang symbol) as a target concept in a random order, and they press the left button ("e") to sort the stimuli to the target category disharmony, and the right button ("i") to sort it to the target category harmony. In the second block, the attractive and unattractive words (attribute concept) are presented, and participants respond with left button for unattractive and right button for attractive. These practice tasks acquaint respondents with stimulus materials and sorting rules. Afterwards, two blocks of experimental trials follow. In the compatible blocks (3 and 4), the left button is used to report disharmony and unattractive words, while the right button is used to report harmony and attractive words. Next, one more training block is presented that include only harmonious and disharmonious pictures, but the response mapping is reversed. Participants have to use the left button to report harmony, and the right button to report disharmony. Finally, this block is followed by the last two blocks (6 and 7) of incompatible trials (left button for harmony and

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unattractive, right button for disharmony and attractive). For respondents who possess stronger associations between harmony and attractiveness (disharmony and unattractiveness) the first sorting task should be much easier (i.e., faster and more accurate) than the second.

Table 6: Sequence of blocks in the IAT measuring harmony evaluations

Block	No. of trails	Items assigned to left-key (“e”) response	Items assigned to right-key (“i”) response
1	20	<i>Disharmonious</i> images	<i>Harmonious</i> images
2	20	Words for “ <i>unattractive</i> ”	Words for “ <i>attractive</i> ”
3	20	<i>Disharmonious</i> images + Words for “ <i>unattractive</i> ”	<i>Harmonious</i> images + Words for “ <i>attractive</i> ”
4	40	<i>Disharmonious</i> images + Words for “ <i>unattractive</i> ”	<i>Harmonious</i> images + Words for “ <i>attractive</i> ”
5	20	<i>Harmonious</i> images	<i>Disharmonious</i> images
6	20	<i>Harmonious</i> images + Words for “ <i>unattractive</i> ”	<i>Disharmonious</i> images + Words for “ <i>attractive</i> ”
7	40	<i>Harmonious</i> images + Words for “ <i>unattractive</i> ”	<i>Disharmonious</i> images + Words for “ <i>attractive</i> ”

In general, ease of sorting can be indexed both by the speed of responding (faster responding indicating stronger associations) and the frequency of errors (fewer errors indicating stronger associations) (Nosek et al., 2007). It is important to note that each stimulus must be identifiable as representing just one of the four categories. A clear categorization can be achieved by using different stimulus modalities (e.g., pictures for harmony, words for attractiveness) and distinct colors or fonts (e.g., green words for harmony and white words for attractiveness). Furthermore, the IAT is relatively unaffected by the number of stimulus items per category. Whether a particular category is assigned to the left or right response key, whether the respondents are right or left-handed, or whether they are familiar with stimulus material have no influence on IAT measures as well. However, Messner and Vosgerau (2010) found that IAT effects can depend on the order of IAT blocks.

Alternative implicit methods

Aside from the IAT, there are additional other instruments that measure implicit attitudes, stereotypes, and (self-)concepts. According to Brunel and colleagues (2004), these measures can be classified into two categories, namely: (1) unstructured and (2) structured ones (measures).

An example of unstructured instruments is projective measure. Central to this measure is that by completing a task (e.g., sentence or word completion and word association tests) participants project parts of themselves (e.g., their attitudes and beliefs) that can be interpreted accordingly. However, these measures often lack convergent validity and are, therefore, not appropriate to serve as psychometric instruments. Further, specific conclusions can often be susceptible to errors due to difficulties in coding and interpretation of qualitative data.

Structured forms include the information test and sequential priming. Because a participant's attitude toward a topic should guide the selection and retention of knowledge, the information test provides an implicit measure of the corresponding attitude. On the other hand, sequential priming means that participants classify words into categories while the effect of the preceding (prime) stimulus on classification speed (response latencies) is observed. Priming measures have relatively low internal consistency and test-retest reliability and are less sensitive to individual differences (Brunel et al., 2004).

IAT advantages and disadvantages

In general, implicit measures have the advantage of avoiding individuals' tendency to control politically incorrect or socially sensitive responses. Moreover, even when people are truthful, they can only report what they think they believe which relies on individuals' ability to introspect accurately. In other words, individuals may not be willing or able to accurately report their stereotypes and self-concept through surveys based on questionnaires and interviews. Implicit measures bypass this "willing and able" problem to provide information that cannot be obtained through self-report (explicit) measures (Rudman & Phelan, 2010). Specific advantages of the IAT are its flexibility and reliability. Furthermore, this test is robust and less sensitive to faking than explicit measures. For example, Greenwald et al. (2002) reported an average test-retest reliability of .60 and numerous studies also show high internal consistencies of Cronbach's alpha (>.80, e.g., Asendorpf et al., 2002). On the other hand, disadvantages of the IAT include questions on its internal validity (underlying

processes of the IAT scores). For example, the chosen categories and stimuli might have an influence on the variance in IAT scores. Moreover, the IAT measures relative associations, hence forbidding an absolute interpretation of the IAT scores (Friese et al., 2006). Consequently, according to Greenwald et al. (2009), there is a lively discussion on how to interpret IAT scores and to what extent they can explain behavior. Nevertheless, there is compelling evidence that the IAT captures implicit processing of information that is distinct from more conscious reasoning.

In sum, research (e.g., with focus on consumer behavior) requires implicit measures where respondents are either unaware or unwilling to reveal their opinions. Consumer research would benefit from measures that display greater convergent validity, reliability, sensitivity to individual differences, and resilience to the effects of image management and attitude accessibility. Overall, findings demonstrate the important role of the IAT as a powerful and robust implicit measure (Friese et al., 2006). This is why the focus of this work is on the IAT, since it is part of Study 6.

Areas of application

Since the first publication (Greenwald et al., 1998), numerous researchers have used the IAT for research on associations in general and implicit preferences in specific across several areas, in particular focusing on social and consumer psychology. For example, Maison et al. (2004) concluded that since the 1980s, much attention has been devoted to reaction time as an indication of automatic processes and automatic activation of attitudes and associations. These processes have been mostly studied in the context of stereotypes and prejudices. The IAT has been useful in investigating relative association strengths in several domains, including racial attitudes, stigmatized behavior such as smoking, gender stereotypes, and numerous others. According to Brunel et al. (2004), understanding of consumers' mental states has been a chief concern in consumer research. Like psychologists, consumer researchers have relied heavily on self-reports of attitudes, stereotypes, and other beliefs, preferences, values, goals, and motives. But often consumers are unable or unwilling to reveal their true opinions due to impression management which leads to socially desirable responding.

In line with the main emphasis of this work, the following chapters give a literature overview on the use of the IAT in gender stereotype (section 4.2) and design research (section 4.3).

4.2 The Implicit Association Test in Gender (Stereotype) Research

“But they [implicit methods] were also prudent, because explicit gender measures may provoke social desirability concerns on the part of respondents.”

(Rudman & Kilianski, 2000, p. 1316)

A considerable stream of empirical work testing implicit gender stereotypes and their influences on attitudes and behavior emerged across several disciplines, with particular focus on the associations between (1) gender and mathematics and (2) gender and personality.

Gender and mathematics

A large body of literature on the gender-mathematics relationship exists. According to Kiefer and Sekaquaptewa (2007), individuals possess implicit gender stereotypes regarding math, indicating stronger association between math and males than between math and females. These implicit prejudices correlate only weakly with explicit stereotypes, suggesting that social desirability might play an important role in research on gender stereotypes. In addition, these implicit gender stereotypes have a negative influence on (females’) actual math performance.

Highlighting the effect of implicit gender stereotypes, another IAT-based study by Reuben et al. (2014) indicates that employers of both sexes associate females less strongly with mathematics than males, with IAT scores having an influence on performance expectation (of male candidates and female candidates). In other words, employers discriminate against female candidates to a degree that correlates with their implicit bias against females as suggested by their IAT score. Thus, stereotypes effect the demand for females in mathematics-related tasks, regardless of quality considerations. In line with cognitive consistency theory, Nosek et al. (2002) examined whether implicit associations between math and gender (i.e., math-gender stereotype) and between gender and self (i.e., gender identity) may relate to more personal associations between math and self (i.e., math identity) and between math and positive attributes (i.e., math attitude). According to their findings, stronger associations between math and male lead to weaker associations between math and self for females but stronger associations between math and self for males. In other words, males

identify more with math and report more positive attitudes towards math than do females due to the strong math-gender stereotype (math = male). These observed correlations between group membership, object gender stereotype, object identification, and attitudes towards the object underscore the relevance for use of the IAT in Study 6 and impact hypothesis development regarding visual harmony (see section 4.3).

Gender and personality

In line with gender role stereotypes discussed in chapter 3.1, extant research has investigated the association between gender and different personality traits (e.g., power and warmth) from both explicit and implicit perspectives. Several self-report measures report reduced gender stereotypes. Because this appearance is based entirely on results obtained with explicit measures, research examining implicit gender stereotypes casts doubt on the ability of self-report measures to reveal the whole story. Accordingly, investigations by Rudman et al. (2001) show that males and females possess implicit gender stereotypes that vary from their conscious beliefs. Rudman and Kilianski (2000) indicate the existence of an implicit prototype for males as leaders and an attendant belief that it is more natural for males to take control. In other words, males are implicitly associated with agentic traits such as independent, individualistic, and competitive, whereas females are associated with communal traits such as connected, supportive, and interdependent. Furthermore, associating males with high authority and females with low authority correlates with negative attitudes toward female authority. The relationship between gender authority beliefs and female authority prejudice is similar for both genders, at both the implicit and explicit level. More recent research by Rudman and Phelan (2010) reveals that priming gender roles can influence females' implicit gender stereotypes (i.e., females = warmth, males = power), self-concept, and career aspirations.

In sum, implicit gender role and gender trait beliefs and attitudes are less likely to show differences based on participant sex or conscious beliefs, compared to self-report counterparts. Both males and females show strong implicit gender stereotypes without realizing that they do so or willing to disclose their beliefs. These observations of weak correlations between measures of implicit and explicit gender stereotypes argue for conceptualizing implicit and explicit gender stereotypes as distinct constructs. The IAT appears to be sensitive to automatic concept-attribute associations underlying implicit

stereotypes, much as it was shown to be sensitive to automatic evaluative associations underlying implicit attitudes.

But to date, IAT-based studies in gender and consumer research have focused mainly on math-related outcomes, power-warmth stereotypes, and traditionally masculine occupations rather than broader interest in marketing-related or, to be more precise, in design-related outcomes. Therefore, the focus of the next chapter lies on studies examining the use of IAT in marketing and design research.

4.3 The Implicit Association Test in Consumer, Marketing, and Design Research

“In understanding consumer attitudes and decisions, emotions, unconscious motives, and automatic processes should be considered.”

(Maison et al., 2004, p. 405)

Despite the problems with consumers being unable or unwilling to reveal their true preferences, beliefs, and attitudes, only a few studies in marketing and consumer research have examined implicit marketing concepts and associations. Because the understanding of consumers' mental states has been a chief concern in consumer research, Brunel et al. (2004) focused on implicit brand attitudes and relationships in their research, with varying results. Their study reveals that IAT-based measures of brand attitudes and relationships are correlated with explicit measures when consumers have access to their attitudes and are willing to share them (i.e., preference for Apple versus IBM). Moreover, the IAT can also capture automatic associations between target concepts and attribute dimensions that are distinct from explicit measures (i.e., preference for ads with white spokespersons versus black spokespersons). This dissociation between implicit and explicit marketing preferences underscores the importance of assessing both. Gattol et al. (2011) extended these findings on brand attitudes by assessing consumer attitudes based on multi-dimensional implicit associations. Their results indicate that the multi-dimensional IAT (md-IAT) has shown to be a reliable, valid, and sensitive indirect measure of brand attitudes (i.e., more detailed attitudes towards AUDI versus BMW).

Because consumers' purchase decisions at the supermarket may be determined by automatic and impulsive processes, several researchers in the food domain started to adopt indirect methods such as the IAT. For example, using a low/high calorie IAT, Maison et al.

(2001) reported that females perceive low calorie products as healthier and more fashionable but also as less tasty than high calorie products. This is in line with results found by Raghunathan et al. (2006). According to them, unhealthy food is implicitly associated with taste and enjoyment. Furthermore, empirical evidence demonstrates the validity of the IAT to predict individuals' food choices between healthy versus unhealthy goods. To examine whether implicit associations between healthiness and non-sugary foods (and between unhealthiness and sugary foods, respectively) relate to explicit attitudes towards sugary foods, Karnal et al. (2016) examined the correlation between the implicit measure and the explicit one (attitude). Taken together, the findings support the notion that explicit and implicit evaluations of sugary foods do not correlate and, thus, reflect different cognitive modes. As one of the first studies, Richetin et al. (2016) examined implicit and explicit attitudes toward organic food brands. They found that implicit and explicit preferences for eco-brands paired with the self are higher compared to those brands paired with the category 'others'.

But to date very little emphasis has been placed on implicit preferences and attitudes toward visual design. The following section shed some light on implicit design associations, focusing on (1) color and (2) harmony variables (i.e., symmetry and roundness).

A recent study by No et al. (2014) explored implicit color–temperature associations, suggesting a strong association between red and high temperature (warm) and a strong association between blue and low temperature (cold). Piqueras-Fiszman and Spence (2011) assessed color–flavor associations for potato chips. According to them, consumers associate specific flavors to specific packaging colors in a product category where color is used to identify product varieties. They also found that the IAT proved to be a reliable behavioral tool with which to explore consumers' underlying correspondences regarding the color of the packaging. Another significant work was conducted by Mai et al. (2016) who revealed a strong automatic linkage between light-colored packages and healthiness in the consumer's mind.

Because the present work focuses mainly on the effect of design harmony, key findings on implicit associations with harmony variables will be reviewed next.

For example, Bertamini et al. (2013a) tested whether and when abstract symmetric patterns produce affective responses by employing the IAT. They hypothesized that individuals would be quicker to classify word valence on congruent trials (random patterns and negative words, or symmetrical patterns and positive words) than incongruent trials (random patterns and positive words, or symmetrical patterns and negative words). As

assumed, regular patterns are associated with faster responses to positive words and irregular patterns are associated with faster responses to negative words.

This is in line with the results found by Makin et al. (2012). Consequently, the classic IAT effect is taken as an implicit measure of preference for regular over random patterns, in agreement with the results of Bertamini et al. (2013a). Higher accuracy in responding to positive target words when they were preceded by symmetric dot patterns was also found by Pecchinenda et al. (2014). Furthermore, Bertamini et al. (2013b) demonstrated that symmetry is associated with both high arousal and positive valence. These findings are consistent with the fluency hypothesis of aesthetics. Regular patterns would thus have higher perceptual fluency than random patterns. The results of the md-IAT suggest that the response to high fluency patterns has two dimensions, namely valence and arousal. In other words, regular patterns are associated with both high valence and high arousal, and also with the ease of processing a mathematical expression.

Palumbo et al. (2015) focused on another harmony variable: roundness. They compared angular and curved shapes in terms of implicit associations. Results show that curved polygons are associated with safe and positive concepts and with female names, whereas angular polygons are associated with danger and negative concepts and with male names. In general, these studies on associations with design characteristics of visual harmony seem to implicate a feminine harmony gender stereotype and a positive harmony evaluation from an implicit perspective. However, since studies focused mainly on the implicit effect of highly specific single elements (i.e., symmetry and roundness), there is lack of research on implicit associations with the holistic design factor harmony. Therefore, the present research hypothesizes:

H9: Visual harmony (disharmony) is more strongly associated with...

- a: ...attractiveness (unattractiveness) than with unattractiveness (attractiveness) (harmony attractiveness evaluation).**
- b: ...femininity (masculinity) than with masculinity (femininity) (harmony gender stereotype).**
- c: ...the self (others) than with others (self) (harmony identification).**

Furthermore in line with cognitive consistency theory in general (Swann & Read, 1981) and identity consistency in specifics (Suh, 2002) (see section 3.3.2 for a detailed review), this work predicts:

H10a: An association between harmony and self is positively related to an association between harmony and attractiveness.

Consistent with results by Nosek et al. (2002), implicit associations between a target object and gender and between gender and self relate to more personal associations between the object and self as well as positive attributes. In this research context, implicit gender identity and implicit gender stereotype of visual harmony should be significantly related to implicit identification with visual harmony and to implicit attractiveness evaluation of visual harmony. In other words, individuals who identify themselves with femininity, identify more strongly with harmony and report more positive attitudes towards harmony than do individuals who identify themselves with masculinity due to the hypothesized harmony gender stereotype (harmony = femininity). Therefore, I predict:

H10b: An association between self and femininity (masculinity) and between harmony and femininity is strongly related to (i) an association between harmony and self (others) and (ii) an association between harmony and attractiveness (unattractiveness).

Research on explicit gender differences (biological and identity) in response to design harmony (see chapter 3 for more details) suggests that females and individuals holding a more feminine identity find harmony in marketing visuals more attractive based on the mediating effects of fluency (see section 3.4.1) and self-congruity (see section 3.4.2). For example, individuals with feminine personality traits identify more with (visual) harmony (high congruity) and, therefore, evaluate harmony as more attractive. Despite literature on dissociations between implicit and explicit measures, I expect the nature of sex- and gender identity-related effects on implicit variables to be in line with those hypothesized in chapter 3:

H11a: Positive implicit associations (i) between harmony and self and (ii) between harmony and attractiveness are more pronounced for females than for males.

H11b: Positive implicit associations (i) between harmony and self and (ii) between harmony and attractiveness are more pronounced for individuals with more feminine identity than for individuals with a less feminine identity.

4.4 The Role of Situational Context and Social Expectations

“More specifically, we conceptualize gender as a component of ongoing interactions in which perceivers emit expectations, target (selves) negotiate their own identities, and the context in which interactions occurs shapes the resultant behavior.”

(Deaux & Major, 1987, p. 369)

One explanation for systematic differences in visual harmony preferences of males and females seems to be a desire to adjust aesthetic preferences toward what males and females believe is appropriate or socially desirable. Furthermore, dissociations between results obtained by explicit and implicit measures suggest that social desirability might play an important role, in particular, in gender stereotype research. Social desirability represents the desire of respondents to avoid embarrassment or stigmatization and project a favorable image to others. For example, Ratner and Kahn (2002) demonstrate that consumers seek more variety in their consumption decisions in the presence of others than they do in private due to social desirability concerns. Consequently, the present work assumes that an awareness that an individual’s choice will be evaluated by others makes the social desirability of the behavior salient and induces impression management. In other words, gendered responses may depend on social interactions with others, and, consequently, on the situational context.

Indeed, recent research illustrates that the desire to create a stereotype-congruent impression in public situations (as opposed to private situations) sometimes leads consumers to make choices that are not congruent with their implicit preferences. As mentioned above, the IAT appears to be a powerful procedure for avoiding socially desirable response behavior and uncovering underlying preferences. Research that does not recognize and compensate for social desirability bias may lead to unwarranted theoretical or practical conclusions about consumers’ (males and females) psychological traits, attitudes, evaluations, and behaviors.

Social context and gendered responses

Deaux and Major (1987) suggest that gender-linked behaviors are influenced by various factors, are highly flexible, and, most importantly, are context dependent. For example, Patterson and Hogg (2004) found that the nature and strength of sex effects can vary depending on the consumption situation (i.e., social context). Their data from qualitative interviews shows that consumers stress the importance of the social context in relation to the salience of their sex. All the interviewees claim that they would be much more conscious of their sex when they were in a public situation as opposed to be in a private situation, and this in turn influences their consumer behavior. This finding is in line with the concept of gender salience and its importance in the situational context of consumption (Gould, 1996). The two paths of gendered consumer behavior introduced by Gould (1996) are described in detail in chapter 3.4.2. While Path 1 describes the influence of gender identity, as a major part of the self-concept, on gendered response in terms of self-congruity, Path 2 emphasizes gender salience as the construction of the situational self-concept, for instance evoked by product symbolism. Here, the influence of reference groups seems to play an important role. Consequently, consumption situations that occur in the presence of others, within membership groups, or peers may have gender consequences (Bearden & Etzel, 1982). Smith et al. (1999) also found that gender-related self-concept changes across various contexts in which individuals interact. In particular, males show an avoidance of being feminine when with others, whereas females are less likely to change their feminine self-concepts across contexts. This is in line with research on gendered brand image (Ulrich & Tissier-Desbordes, 2013), showing that using feminine brands carries a greater stigma for males than using masculine brands does for females. This supports earlier research which suggests that males have more insecurities about using products which are considered typically feminine, than females have about using some typically masculine products (Kirkham & Attfield, 1996). This corresponds with Alreck's (1994) claim that females will sometimes accept masculine products, but males will almost always reject feminine products. As a result, the situational context should be considered as a possible interacting variable.

Social context and gendered design preferences

Designs fulfill important symbolic functions and consumers often use products, specifically their design, to maintain and enhance their self-concept including gender (biological and identity) (see chapter 2.1 for more details on the symbolic function of visual design) (O'Donohoe, 1994). For example, van den Hende and Mugge (2014) show that individuals respond favorably to products that are associated with their own sex, and they desire to avoid those products that are associated with the other. This is reasoned by the fact that individuals use products to express to others who they are. Another study by Fisher and Dubé (2005) found that male responses to stereotype-congruent (incongruent) advertisements are affected by the presence of other males in the consumption situation as opposed to the presence of females. In other words, the design of a product or advertisement can serve as a symbol through which consumers communicate their context-dependent self-identity thereby reinforcing their gender (Gould, 1996). As a result, social context should be included as a variable when studying gendered design effects. Based on research on visual harmony and the role of social expectations, males' and females' design preferences should depend on both the presence of others in the environment (i.e., social situation) and the harmony of the visual (Fisher & Dubé, 2005).

Given the association between harmony and femininity, this combination would be stereotype-incongruent for males and stereotype-congruent for females, and vice versa. Furthermore, because no potential for social approval or disapproval exists in private situations, individuals, especially males, can express their aesthetic preferences freely. In public, however, individuals are motivated to ensure their design preferences are congruent with social expectations. Therefore, males should be more disposed to preferring harmony in designs when consumption occurs in private as opposed to public. Analogously, females should be more disposed to preferring harmony in designs when consumption occurs in public as opposed to private. However, to the best of my knowledge, these expectations have not been empirically tested in marketing and consumer research. Therefore, this work posits that:

H12a: The moderating effect of sex on the harmony-self-congruity-attractiveness relationship will depend on the social context such that the conditional effect is stronger (weaker) with females in a public (private) situation and is stronger (weaker) with males in a private (public) situation.

Because central to gender (identity) salience theory (Gould, 1996) is that the expression of an individual's gender identity involves a person-by-situation interaction, the same pattern of results should occur regarding the moderating role of gender identity. Martin and Gnoth (2009) showed that more masculine males preferred typically 'male' models, whereas more feminine males preferred more feminine male models, but only in private, as the opinions of others cause them to conform to gender stereotypes in public. Thus:

H12b: The moderating effect of gender identity on the harmony-self-congruity-attractiveness relationship will depend on the social context, such that the conditional effect is stronger (weaker) with high feminine identities in a public (private) situation and is stronger (weaker) with high masculine identities in a private (public) situation.

Therefore, Study 7 was conducted to test how sex and gender identity influence attractiveness evaluation of visual harmony in different situations. To my knowledge, no research has considered social context effects in design-related domains.

4.5 Summary and Relevance for the Empirical Studies

Literature demonstrates the important role played by the IAT in investigating automated and unconscious associations and even preferences. The present work thus argues that focusing on implicit associations, attitudes, beliefs, and self-concept could constitute an important avenue for examining true evaluations of the design of marketing visuals, with special focus on gender differences. In other words, the IAT-based procedure might be an effective instrument to reduce the influence of social desirability on gender-related opinions and preferences (which, in turn, plays an important role in self-reported measures). Furthermore, this chapter clearly highlights the role of social expectations and, hence, situational consumption context in both gender-related and design-related research. In other words, consumers are dynamic beings and those characteristics associated with our gender are situation dependent and dynamic as well. In this context, the aims are twofold.

First, I aim to investigate implicit harmony gender stereotypes, harmony attractiveness evaluation and harmony identification and, additionally, to explore gender identity- and sex-based differences in these implicit constructs. Therefore, Study 6 applies the IAT for assessing implicit associations and understanding the relationship among these constructs (see section 5.5). To be more precise, in line with self-congruity theory, there might be strong correlations between group membership (being male or female; having a feminine or masculine gender identity), gender stereotypes (i.e., harmony = female), implicit identification (i.e., self = harmony), and implicit evaluation (i.e., harmony = attractive).

Second, I also aim at testing whether the social context influences sex and gender identity effects on the indirect effect of visual harmony on attractiveness evaluation through self-congruity (see section 5.6 for Study 7). To be more precise, because the often postulated discrepancy between implicit and explicit results (Maison et al., 2004) could be traced back to social expectations, the social context of consumption situation could play an important role in forming gender-related design preferences.

5 Empirical Studies

This chapter presents seven empirical studies which differ in objectives and methodology. Study 1 aims at determining what facets of harmony (i.e., balance, symmetry, contrast, unity, and variety) contribute more or less to the overall harmony effect (H1). Study 2 examines the main effect of visual harmony on attractiveness across a range of realistic stimuli (H2). Furthermore, it tests the interactive effect of respondent sex with a design's visual harmony on attractiveness (H4). The objectives of Study 3 are to test the dynamic effect of harmony's attractiveness evaluation (H3), to replicate the moderating effect of respondent sex on the harmony-attractiveness relationship, and to test if the moderating effect prevails when other personality traits (i.e., CVPA and agreeableness) are controlled for. Study 4 and Study 5 extend previous studies by examining why systematic differences in attractiveness evaluation of visual harmony occur. Here, the emphasis is placed on the mediating role of processing fluency (Study 4) and self-congruity (Study 5) in line with Hypothesis 5 and 6. In addition, both Study 4 and Study 5 explore the influence of respondent sex as opposed to gender identity (H7 and H8). Study 6 applies an IAT for assessing implicit associations with visual harmony (H9), understanding the relationship among these associations (H10), and, finally, assessing sex- and gender identity-related differences in implicit associations (H11). The final Study 7 aims at testing how the social context of consumption influences sex and gender identity effects on the indirect effect of visual harmony on attractiveness evaluation through self-congruity (H12). Table 7 shows an overview of the empirical studies. The development of the conceptual model is presented in Figure 8.

Table 7: Overview on empirical studies

	Study 1	Study 2	Study 3	Study 4	Study 5	Study 6	Study 7
Focus	Defining visual harmony in product design	Testing sex differences in response to visual harmony	Replication of Study 2 while controlling for personality correlates	Testing the underlying mechanism of processing fluency	Testing the underlying mechanism of self-congruity	Assessing gender differences based on md-IAT	Testing the influence of situational context
Stimuli	Lamps, mobiles, and chairs	Logos, typefaces, and kettles	Logos, typefaces, and kettles	Logos, typefaces, and kettles	Logos, typefaces, and kettles	Words and pictures	Wine packages
Method	Psychological measurement (student sample, n = 81)	Psychological measurement (student sample, n = 78)	Psychological measurement, RET (consumer sample, n = 212)	Psychological measurement (consumer sample, n = 60)	Psychological measurement (student sample, n = 91)	Implicit association test (student sample, n = 60)	Psychological measurement (student sample, n = 246)

Notes: n = sample size.

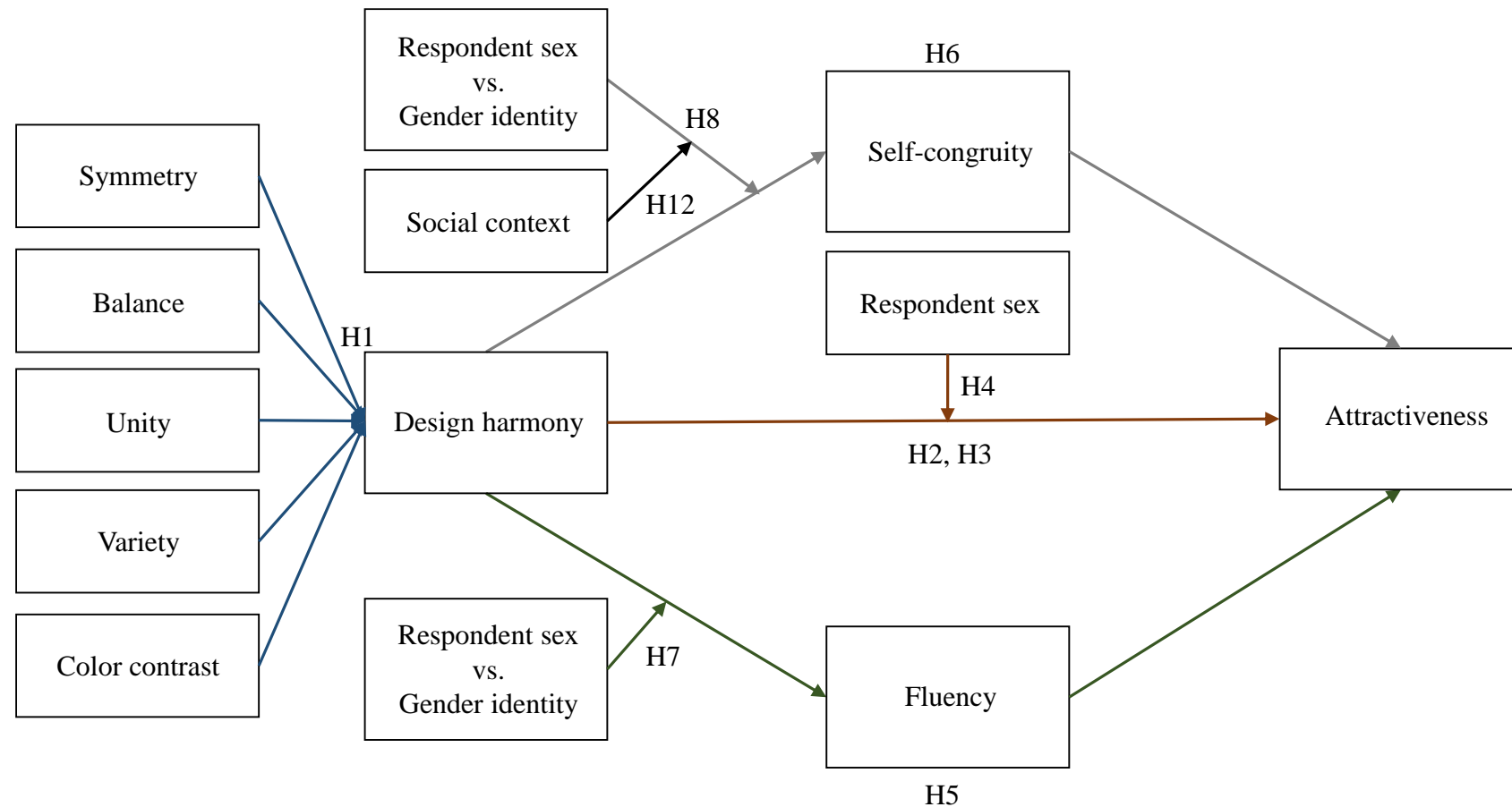


Figure 8: Conceptual model

Notes: Blue lines denote the conceptual model for Study 1 (testing H1), orange lines denote the conceptual model for Studies 2 and 3 (testing H2, H3, and H4), green lines denote the conceptual model for Study 4 (testing H5 and H7), grey lines denote the conceptual model for Study 5 (testing H6 and H8), and black lines denote the conceptual model for Study 7 (testing H12). Study 6 investigates implicit associations and correlations (H9-11).

5.1 Study 1: Defining Visual Harmony

5.1.1 Objective

The literature on the definition of visual harmony shows mixed results. According to the Oxford English Dictionary (2014), harmony is defined as the combination or adaptation of parts, elements, or related things, so as to form a consistent and orderly whole. Furthermore, synonyms of harmony are agreement, accord, and congruity. Henderson and Cote (1998), on the other hand, highlight the influence of symmetry and balance on the perception of visual harmony. A further definition by Kumar and Garg (2010) emphasizes unity as a constitutive element of design harmony. Here, harmony is defined as the degree to which the visual resources of a composition's design form a coherent, unified pattern. Taken together, in line with Gestalt theory, several design characteristics such as symmetry, balance and unity seem to play a crucial part in the overall composition of design harmony. But to date, it remains unclear what facets of harmony contribute more or less to the overall harmony effect. Consequently, the aim of Study 1 is to shed further light on this issue.

5.1.2 Theoretical Background

Since past research has shown that balance, symmetry, contrast, unity, and variety appear to be constitutive elements of visual harmony or disharmony (see section 2.2 for more details), the present study integrates and builds on these findings by identifying the actual function of these components in the overall definition of harmony. Accordingly, Hypothesis 1 states that there are significant differences between visuals high in harmony, moderate in harmony, and low in harmony in terms of balance, symmetry, contrast, unity, and variety. These five general design principles of visual harmony will be defined next.

Balance

Balance in design represents an equilibrium between two weights or components of the design (Henderson & Cote, 1998). One feature of a composition that is a major contributing factor to its balance structure is the distribution of "weight" in the composition (Locher, 2006).

Symmetry

Symmetry affects the visual perception of objects and is detected holistically during the first glance (Locher & Nodine, 1989). Symmetry can be achieved by reflecting objects about one or more axes (Hekkert & Leder, 2008). An important part of symmetry preference might be due to ease of processing (Reber et al., 2004). Concerning beauty of faces it has been argued that symmetry indicates a healthy development and therefore is an indicator of positive genetic make-up (Grammer & Thornhill, 1994).

Contrast

Another consideration in creating harmonious designs is the interplay of colors (Wei et al., 2014). Low contrast between colors that appear close to each other, matching color combinations, and little variety in colors make for more harmonious designs (Lin, 2013; Orth & Malkewitz, 2008).

Unity

Unity refers to a “congruity among the elements of a design such that they look as though they belong together or as though there is some visual connection [...]” (Veryzer, 1993, p. 226). Veryzer and Hutchinson (1998) examined unity by manipulating the contours of different products. They found that higher levels of unity are associated with more favorable responses to product designs.

Variety/Complexity

Berlyne (1958) proposed that the quantity of objects, amount of details, and irregularities of elements increase visual variety/complexity. Cox and Cox (2002) found that moderately complex product design are usually preferred over less and more complex ones. An explanation for these preferences is that visuals low in variety and thus with low arousal potential do not stimulate the viewer. On the other hand, visuals high in variety (= high arousal potential) are too difficult to grasp and are considered unpleasant. Consequently, stimuli with an arousal potential at a medium level are preferred. Although ample evidence was found for an inverted U-shaped relationship between preference and variety/complexity, other, mainly monotonic, functions between these two variables were observed as well.

5.1.3 Method

A survey was conducted to obtain evidence that would help to accomplish the aim of Study 1. Data were collected with the help of a research assistant. Ninety students ($M_{\text{age}} = 24.2$ years, $SD = 2.34$, 85 percent females) recruited from a large university in Germany participated in the current study where harmony was manipulated and balance, symmetry, contrast, unity, and variety were measured. Lamps, mobiles, and chairs were selected as appropriate stimuli due to the key role of their visual design as a purchase criterion and the large variance in design. A pretest aided in selecting a wide range of stimuli varying in visual harmony (high, moderate, and low). For this purpose, twelve marketing and design experts indicated the two most harmonious, least harmonious, and most moderate harmonious visuals for each product category based on a large pool of items offered by an online retailer. Table 8 holds final stimuli for the main study.

Here, participants were asked to complete a questionnaire on a voluntary basis. The paper questionnaire took approximately 10 minutes to complete (see Appendix G for the questionnaire). After reading a brief introduction participants proceeded to view six randomly assigned stimuli (two lamps, two mobiles, and two chairs) and to rate them on 12 design statements (balance, symmetry, contrast, unity, and variety), attractiveness, and harmony perception (serves as a manipulation check). Analyses were conducted at the stimulus level.

Table 8: Stimuli set

Product category	Harmony category		
	low	moderate	high
Lamps			
			
Mobiles			
			
Chairs			
			

To assess *balance, symmetry, contrast, unity, and variety* statements developed by Henderson et al. (2004), Lin (2013), and Orth and Malkewitz (2008) were employed (see Table 9 for more details). Students were asked to evaluate the stimuli according to all design principles on a seven-point Likert-scale ranging from strongly disagree (1) to strongly agree (7). In addition, to assess design harmony, a one item seven-point Likert scale of Kumar and Garg (2010) was used. Likewise, a one item seven-point Likert scale of Hirschman (1986) measured participants' attractiveness evaluation. Demographic data (sex and age) were collected at the end.

Table 9: Study 1 constructs and measurement statistics

Construct	<i>IFC</i>	<i>M</i>	<i>SD</i>	<i>EV</i>	α
<i>Balance</i> (Henderson et al., 2004; Lin, 2013)		4.73	1.53	79.58	.87
Design elements have some kind of equal visual weight.	.91				
The arrangement of design elements creates a feeling of equilibrium.	.91				
Design elements are distributed equally.	.85				
<i>Symmetry</i> (Henderson et al., 2004; Lin, 2013)		4.83	1.68	78.10	.71
Design elements are organized symmetrically.	.88				
The form is asymmetrical (reverse coded).	.88				
<i>Color Contrast</i> (Lin, 2013)		3.44	1.77	76.36	.69
Contrasting colors appear close to each other.	.87				
The darker parts stand out against the brighter parts.	.87				
<i>Unity</i> (Lin 2013; Orth & Malkewitz, 2008)		4.94	1.33	58.23	.63
Design elements make a unified design.	.87				
The color scheme is coherent.	.73				
Design elements are arranged randomly (reverse coded).	.67				
<i>Variety</i> (Lin, 2013)		4.38	1.81	79.46	.74
This design has objects of different colors and shapes.	.89				
This design has various elements.	.89				
<i>Harmony</i> (Kumar & Garg, 2010)	-	4.67	1.82	-	-
This design looks harmonious.					
<i>Attractiveness</i> (Hirschman, 1986)	-	3.90	2.08	-	-
This design is attractive.					

Notes: *IFC* = Item-Factor-Correlation, *M* = Mean, *SD* = Standard Deviation, *EV* = Explained Variance, α = Cronbach's alpha.

5.1.4 Results

Manipulation check

Results indicated a significant effect of the experimental manipulations on perceived harmony ($F(2, 536) = 21.43, p < .001$), with the stimuli selected to represent high harmony scoring higher ($M = 5.26, SD = 1.55$) than the stimuli selected to represent moderate ($M = 4.70, SD = 1.76$) and low harmony ($M = 4.04, SD = 1.93$). The manipulation of harmony can be considered successful.

Testing for group differences

Analyses were conducted at the stimulus level in order to demonstrate relationships between harmony categories (low, moderate, high) and design principles (balance, symmetry, contrast, unity, and variety). To obtain a score for each harmony category on a specific variable, individual ratings of a harmony category were averaged (i.e., consumer responses). To determine which design principles significantly differentiated harmony categories, a one-way analysis of variance (ANOVA) was conducted. Table 10 reports the means and standard deviations across harmony categories. As predicted, there were statistically significant differences between groups as determined by one-way ANOVA in balance ($F(2, 535) = 30.23, p < .001$), symmetry ($F(2, 531) = 37.20, p < .001$), contrast ($F(2, 530) = 10.48, p < .001$), unity ($F(2, 532) = 43.29, p < .001$), and variety ($F(2, 521) = 76.52, p < .001$). To determine what harmony-specific design scores were significantly smaller or greater than the mean score across all categories, t-tests were performed. Results show that participants judged the stimuli low in harmony to be more varied ($t(175) = 7.92, p < .001$) and less balanced ($t(179) = -5.11, p < .001$), symmetrical ($t(179) = -5.14, p < .001$), and unified ($t(176) = -5.95, p < .001$). Interestingly, low harmony did not differ significantly in contrast perception from the mean score ($t(179) = 1.59, p = .114$). Products high in harmony were perceived as more balanced ($t(178) = 5.97, p < .001$), symmetrical ($t(175) = 7.70, p < .001$), and unified ($t(179) = 7.19, p < .001$) than the pooled sample means, whereas they scored significant lower on variety ($t(172) = -9.47, p < .001$) and contrast measures ($t(175) = -3.82, p < .001$). Unsurprisingly, stimuli moderate in harmony did not differ from the pooled sample means. In addition, participants found the products high in harmony more attractiveness than the products moderate and low, respectively, in harmony.

Table 10: Harmony groups and differentiating design principles

Design principle	Harmony category			Sample mean	F	p
	Low harmony	Moderate harmony	High harmony			
Balance	4.12 ⁻ (1.63)	4.77 (1.44)	5.32 ⁺ (1.29)	4.74 (1.53)	30.23	<.001
Symmetry	4.15 ⁻ (1.81)	4.82 (1.56)	5.58 ⁺ (1.27)	4.84 (1.67)	37.20	<.001
Contrast	3.64 (1.73)	3.72 (1.78)	2.95 ⁻ (1.70)	3.44 (1.77)	10.48	<.001
Unity	4.30 ⁻ (1.44)	5.01 (1.19)	5.51 ⁺ (1.07)	4.94 (1.33)	43.29	<.001
Variety	5.39 ⁺ (1.69)	4.45 (1.56)	3.28 ⁻ (1.53)	4.38 (1.81)	76.52	<.001
Harmony	4.04 ⁻ (1.93)	4.70 (1.76)	5.26 ⁺ (1.55)	4.67 (1.82)	9.27	<.001
Attractiveness	3.46 ⁻ (2.23)	3.85 (2.00)	4.39 ⁺ (1.91)	3.90 (2.08)	21.43	<.001

Notes: + indicates harmony category mean scores significantly ($p < .01$) greater than pooled mean, and - indicates harmony category mean scores significantly smaller than pooled mean.

Furthermore, Pearson product-moment correlation coefficients were computed to assess the strength of the relationship between measured design harmony and each design principle (i.e., ratings of balance, symmetry, contrast, unity, and variety). In line with results on group differences, there are strong, positive correlations between harmony perception and ratings of unity ($r = .75, p < .001$) and balance ($r = .72, p < .001$). Furthermore, harmony is moderately related to symmetry ($r = .40, p < .001$). In other words, increases in harmony perception are correlated with increases in ratings of the design characteristics unity, symmetry, and balance. Based on the results, visual harmony is weakly negatively correlated to variety ($r = -.33, p < .001$) and not significantly correlated to contrast ($r = -.08, p = .062$).

5.1.5 Discussion

Study 1 demonstrates that products high in visual harmony are perceived to be more balanced, symmetric, and unified than products low in visual harmony, and also that harmonious products are judged to have less contrast and be less complex than disharmonious products. Furthermore, consistent with correlation results, the design characteristics unity and balance appear to be more strongly related to harmony than symmetry and variety. However, color contrast does not seem to be an important contributor towards visual harmony. Taken together, Study 1 provides first insights into how specific design principles are organized to form the higher-order design factor harmony. Therefore, the present work has taken the first step to better understand visual harmony by tracing it back to more basic and, more importantly, measurable design elements which is critical in helping firms better design their products and packages. In context of the present research, these findings help to design and select marketing visuals high versus low in harmony as stimuli for further research on the holistic design factor. Additionally, Study 1 shows first signs for a positive harmony-attractiveness relationship which is examined in detail in Study 2 and Study 3.

Despite the significance of findings, a few limitations remained. For example, as visuals low in harmony show a moderate harmony evaluation ($M_{\text{harmony}}[\text{low harmony}] = 4.04$), stimuli for future research should be chosen carefully and after thorough pretests, with focus on relevant design principles revealed in this study.

5.2 Studies 2 and 3: Sex Differences in Response to Visual Harmony

5.2.1 Objective

First, in line with Gestalt theory, both Study 2 and Study 3 examine the main effect of visual harmony as a generic factor of design on attractiveness evaluation across a range of realistic stimuli. Additionally, Study 3 focuses on the dynamic effect of attractiveness evaluation by integrating frequent presentations of the visuals (i.e., RET). Second, the present empirical studies aim to close the research gap on differences in how females and males respond to harmony in visual design. Therefore, Study 2 tests the interactive effect of respondent sex with a design's visual harmony on attractiveness. Study 3 is designed to replicate the moderating effect of respondent sex on the relationship between harmony and attractiveness and to test if the moderating effect is robust in the presence of other personality correlates (i.e., CVPA and agreeableness).

In sum, Study 2 and 3 aim at testing the predictions on the positive main effect of visual harmony on attractiveness evaluation (H2 and H3) and on the moderating role of respondent sex in the harmony-attractiveness relationship (H4).

5.2.2 Theoretical Background

Previous research has linked harmony to attractiveness, both as a generic factor and at the level of specific elements. As a factor, visual harmony positively impacts attractiveness for marketing stimuli such as logos (van der Lans et al., 2009), typefaces (Henderson et al., 2004), brand packages (Orth et al., 2010), products (Veryzer & Hutchinson, 1998), and websites (Lin, 2013). In terms of lower-level elements, attractiveness is influenced by unity (Veryzer & Hutchinson, 1998), symmetry (Jacobsen & Höfel, 2003), proportion (Pittard et al., 2007), and roundness (Schmitt & Simonson, 1997). Partially replicating and extending prior research I assume visual harmony to have a positive influence on attractiveness. Consistent with Bornstein (1990) and Cox and Cox (1988), harmony's impact on attractiveness is expected to be dynamic such that the effect of harmony should decrease, whereas the effect of disharmony should increase over time.

Furthermore, in line with both Bloch's (1995) framework on design response and literature on the symbolic function of visual design, several studies have investigated different factors as influencers of evaluative outcomes (e.g., Orth et al., 2010). For example, theory, in

particular on the selectivity hypothesis, and past empirical results posit that respondent sex might moderate the harmony-attractiveness relationship such that designs low in harmony will be evaluated as more attractive by males rather than females, whereas designs high in harmony will be evaluated as more attractive by females rather than males.

However, other possible individual factors with an impact on attractiveness evaluation of design harmony exist, including agreeableness (Schmitt et al., 2008) and CVPA (Orth et al., 2010). According to Bloch et al. (2003), the so-called centrality of visual product aesthetics (CVPA) is a crucial moderator of beauty's value with a strong impact on the willingness to pay for attractive products. Agreeableness, on the other hand, is linked to socially valued traits and prosocial motives. A person with a high level of agreeableness is usually perceived as kind, sympathetic, cooperative, warm, and considerate, and thus more congruent with visual harmony and its associations (Schmitt et al., 2008).

5.2.3 Study 2: Sex Differences in Response to Visual Harmony







5.2.3.1 Stimuli

Given the critical nature of stimuli in research on aesthetics, I followed a rigorous process for selecting stimuli. First, I selected three types of marketing visuals based on their use in past research and to enhance the generalizability of findings. An additional criterion in selecting stimuli types was that they should appeal uniformly to both sexes. These considerations yielded focusing on typefaces (Henderson et al., 2004), logos (Henderson & Cote, 1998), and product design (Kumar & Garg, 2010). For logos and typefaces, well-tested stimuli high versus low in visual harmony were taken from previous research (logos: Henderson & Cote, 1998; typefaces: Henderson et al., 2004). An electric kettle was selected as the third type of marketing visuals. Next, a series of pilot studies aided in categorizing the electric kettles as high and low, respectively, in harmony. In the first step, ten marketing and design professionals ranked 25 digital images on visual harmony ($M_{\text{rank}} = 13.00$, $SD = 5.59$; $Range = 4.10$ to 24.80 , see Appendix A for detailed information on pretest results). In the second step, seventy students recruited from a large public university in Germany evaluated the three designs identified by the professionals as most harmonious ($M = 5.81$, $SD = 1.15$, $M = 5.08$, $SD = 1.52$, and $M = 5.01$, $SD = 1.27$) and another three identified as least harmonious ($M = 2.87$, $SD = 1.57$, $M = 2.93$, $SD = 1.39$, and $M = 3.21$, $SD = 1.27$), using a seven-point semantic differential scale ranging from not at all harmonious (1) to harmonious (7). This process yielded the set of stimuli for use in the main studies.

5.2.3.2 Method

Next, seventy-eight students ($M_{\text{age}} = 23.1$ years, $SD = 2.73$, 70 percent females) recruited from a marketing class at a large public university in Germany participated in a laboratory study. After indicating their impressions in response to three visuals (i.e., one randomly selected image from each of the three stimulus categories), participants submitted information regarding the attractiveness of the design (Hirschman, 1986; $\alpha = .79$, $M = 3.42$, $SD = 1.48$), harmony of the stimulus (Kumar & Garg, 2010; $M = 4.06$, $SD = 1.85$) (see Appendix B for more details on scale items and measurement statistics), and their sex and age. Table 11 shows study stimuli and their scores on visual harmony. Analyses were conducted at the stimulus level, resulting in 234 attractiveness ratings.

Table 11: Stimuli and their scores on harmony

Stimulus type	Low harmony	High harmony
Logo	 $M = 3.03, SD = 1.50$	 $M = 5.59, SD = 1.04$
Typeface	 $M = 2.60, SD = 1.41$	 $M = 4.13, SD = 1.60$
Product (electric kettle)	 $M = 3.08, SD = 1.35$	 $M = 5.95, SD = .92$

5.2.3.3 Results

Results of a three-way mixed-design analysis of variance (ANOVA) with harmony (low vs. high) and marketing visuals (logo vs. typeface vs. product) as within-subjects factors, sex (female vs. male) as between-subjects factor, and attractiveness as the dependent variable show significant main effects of harmony ($F(1, 233) = 77.35, p < .001$) and marketing visuals ($F(2, 233) = 7.92, p < .001$). Furthermore, the two-way interaction between respondent sex and harmony ($F(1, 233) = 5.34, p = .021$) was significant. Post-hoc contrasts showed that females found harmonious designs more attractive than did males ($M = 4.38$ vs. $M = 3.92, t =$

1.92, $p = .06$, see Figure 10a). These findings are consistent with the presumed main effect of harmony on attractiveness (H2) found in previous research. They also support Hypothesis 4 by providing preliminary evidence for the claim that respondent sex interacts with a design's harmony to influence individual evaluations of attractiveness.

5.2.3.4 Discussion

Consistent with Study 1 and research on harmony evaluation, Study 2 confirms the strong and positive main effect on attractiveness. However, this study does not capture the dynamic processing of attractiveness, as presumed by Carbon and Leder (2005). Moreover, although Study 2 provides support for the notion that sex interacts with a design's harmony, it does not account for the effect of other possibly relevant individual difference variables. In the context of aesthetic preferences at least two individual factors could explain the observed variance in the dependent variable: CVPA (Bloch et al., 2003) and agreeableness (McManus & Furnham, 2006). Essentially, CVPA posits that aesthetics hold greater significance to certain individuals and are hence more discerning about their preferences. Agreeableness, on the other hand, is based on individual behavioral characteristics that are perceived as kind, sympathetic, cooperative, warm, and considerate, which should be more congruent with visual harmony and its associations. To better isolate the impact of respondent sex and to parse out the effect of these close personality correlates, Study 3 accounts for these variables as possible influences by including them as covariates.

5.2.4 Study 3: Sex Differences in Response to Visual Harmony – a Replication and Extension

Study 3 was designed to test (a) the dynamic effect of harmony's attractiveness evaluation, (b) if respondent sex moderates the relationship between harmony and attractiveness (for purposes of replication), and (c) if the moderating effect of respondent sex on the relationship between harmony and perceived attractiveness is robust when the effects of CVPA and agreeableness are accounted for.

5.2.4.1 Method

Two hundred and twelve consumers ($M_{\text{age}} = 32$ years, $SD = 9.59$, 50 percent females) from Germany participated in an online experiment employing a 2 (phase: T₁ vs. T₂) x 2 (harmony: low vs. high) x 3 (marketing visuals: logo vs. typeface vs. kettle) x 2 (sex: female vs. male) mixed factorial design with phase, harmony, and marketing visuals as within factors and sex as between-subjects factor. First, participants viewed images, one by one, in random

order, of the six stimuli, submitting rating of attractiveness in an initial rating phase (T_1) (five-point one-item form of Hirschman's (1986) attractiveness scale; $M = 2.56$, $SD = 1.19$). Afterwards, an extended evaluation phase followed. In its entirety, the procedure closely followed the repeated evaluation technique (RET) employed by Carbon and Leder (2005). In this phase, participants were instructed to rate the same stimuli on 25 different attributes (e.g., luxurious; see Appendix I for the full list) before they submitted the second and last rating of attractiveness (T_2) ($M = 2.74$, $SD = 1.29$). The order of the rating blocks in the RET phase was fully randomized across participants. Since past research has shown that other individual difference factors can play a role in design preferences, participants then submitted ratings of individual differences in CVPA (Bloch et al., 2003), and agreeableness (McManus & Furnham, 2006). More specifically, they submitted scores for each of the three relevant dimensions from the CVPA scale [value ($\alpha = .81$, $M = 3.26$, $SD = .88$), acumen ($\alpha = .83$, $M = 2.96$, $SD = .93$), and response ($\alpha = .75$, $M = 3.01$, $SD = .97$)] and for agreeableness ($\alpha = .65$, $M = 4.29$, $SD = .55$) (see Appendix B for more details on scale items and measurement statistics). To control for possible distorting effects of these factors, they were included in the model as covariates. The author supervised the collection of data by a research assistant.

5.2.4.2 Results

A repeated measures analysis of covariance (ANCOVA) with CVPA and agreeableness included as covariates indicated a significant main effect of harmony ($F(1, 208) = 3.35$, $p = .049$), in support of Hypothesis 2. Participants rated visuals high in harmony as more attractive than visuals low in harmony ($M_{\text{high}} = 3.15$, $SD = .04$ vs. $M_{\text{low}} = 2.16$, $SD = .04$). No other main effects were significant (see Appendix C for more details). Moreover, the results indicated a nonsignificant interaction between visual harmony and repeated evaluation (i.e., phase) on attractiveness ($F(1, 208) = .03$, $p = .869$). Pairwise comparisons revealed that both visuals high in harmony and visuals low in harmony were evaluated as more attractive in T_2 ($M_{\text{high}} = 3.28$, $SD = .05$; $M_{\text{low}} = 2.20$, $SD = .04$) than in T_1 ($M_{\text{high}} = 3.01$, $SD = .04$ vs. $M_{\text{low}} = 2.11$, $SD = .05$). Interestingly, the increase in attractiveness evaluation was greater for harmonious designs ($M_{\text{diff}[T_2-T_1]} = .28$, $p < .001$) than for low-harmony designs ($M_{\text{diff}[T_2-T_1]} = .09$, $p = .013$) (see Figure 9).

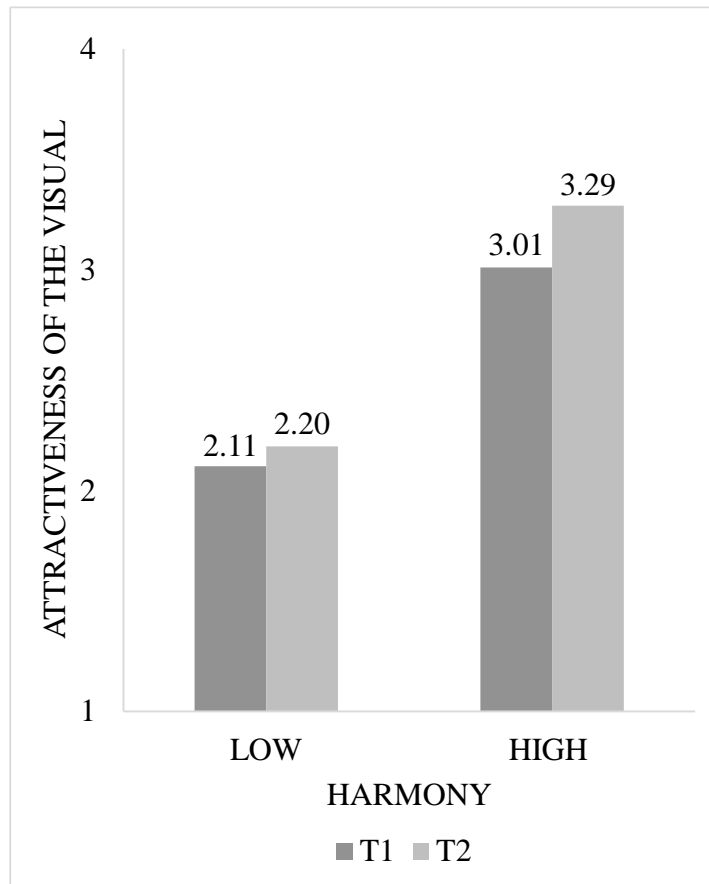


Figure 9: Attractiveness evaluation of visual harmony in T₁ and T₂

Furthermore, the respondent sex x harmony interaction ($F(1, 208) = 16.82, p < .001$) had a significant effect on attractiveness, supporting Hypothesis 4. Post-hoc comparisons showed that females found harmonious designs more attractive than did males ($M_{\text{female}} = 3.29, SD = .06$ vs. $M_{\text{male}} = 3.00, SD = .06, p = .001$), whereas females evaluated low-harmony designs as less attractive than did males ($M_{\text{female}} = 2.07, SD = 1.06$ vs. $M_{\text{male}} = 2.24, SD = .06, p = .044$) (see Figure 10b). However, as indicated by a nonsignificant interaction between sex, harmony, and phase ($F(1, 208) = .33, p = .568$), the moderating effect of respondent sex in the harmony-attractiveness relationship was not influenced by repeated evaluations. In sum, these findings corroborate Study 2 findings and add evidence for the robustness of the main effect of visual harmony on attractiveness evaluation as well as the moderating effect of respondent sex.

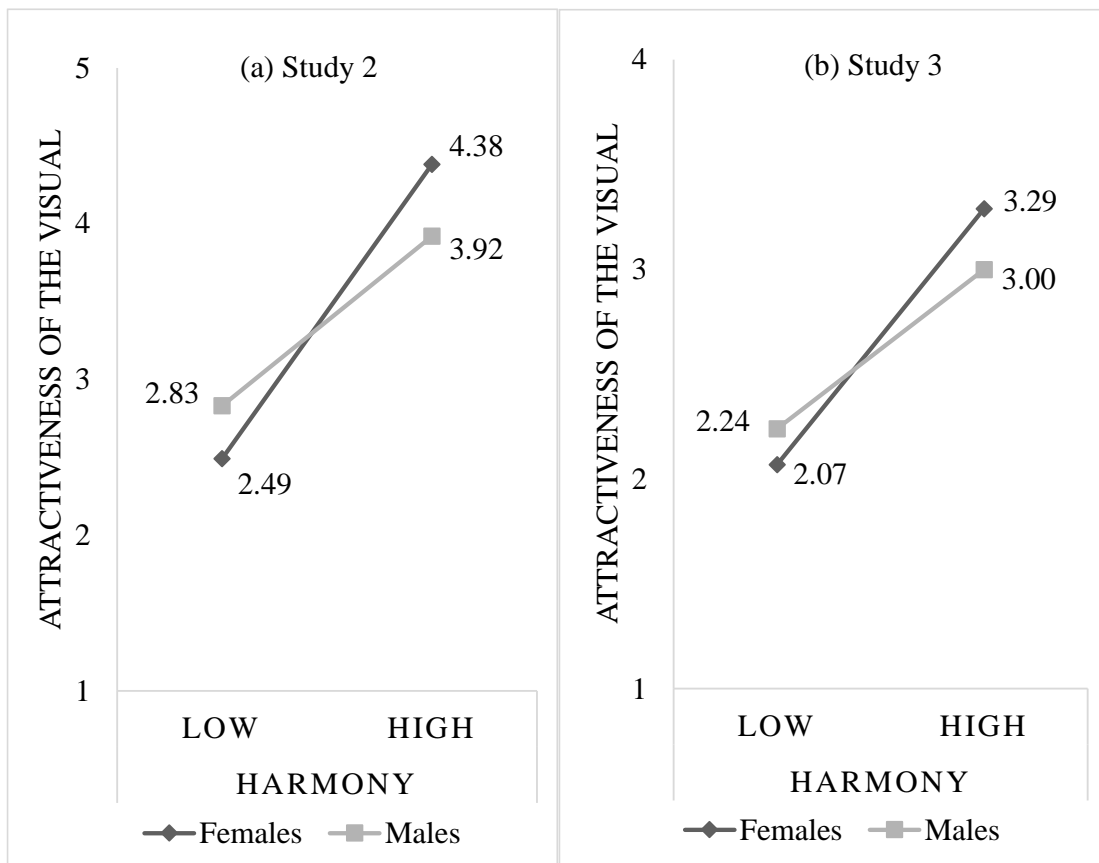


Figure 10: Effect of sex on the design harmony-attractiveness relationship from Study 2 and Study 3

5.2.4.3 Discussion

Findings from both Study 2 and Study 3 are generally in line with research on the main effect of harmony on attractiveness (e.g., Grammer & Thornhill, 1994), initial findings obtained in Study 1, and suggestions that differences may exist in how females and males respond to design harmony (Xue & Yen, 2007). Contrasting Hypothesis 3, participants rated the visuals as more attractive in T_2 than in T_1 , regardless of the stimulus' harmony. Consistent with Zajonc (1968, 2001), this effect could be interpreted a general effect of mere exposure, demonstrating that attractiveness increases through repetition. In the case of harmony, boredom does not seem to inhibit this repeated exposure effect. Yet, although I find support for the hypothesis that respondent sex interacts with a design's harmony, two issues remain: Study 2 and Study 3 do not explain (a) why harmony influences a visual's attractiveness, (b) why differences in attractiveness evaluation occur, in particular, how the moderating effect of sex unfolds, and (c) what role social gender identity may play in the relationship among these variables and whether it can be a better predictor of aesthetic preferences than respondent sex. Study 4 and Study 5 are designed to test processing fluency and self-congruity as possible

mediators and respondent sex versus gender identity as moderators of the relationship between visual harmony and attractiveness.

5.3 Study 4: Clarifying Underlying Mechanisms I: Processing Fluency

5.3.1 Objective

Study 4 tests processing fluency as a possible mediator of the relationship between visual harmony and attractiveness (H5) which was found in both Study 2 and Study 3. Furthermore, Study 4 aims at exploring the moderating role of respondent sex as opposed to gender identity (H7a and H7b).

5.3.2 Theoretical Background

Research on fluency assumes that fluent processing of a stimulus impacts perceiver's liking and attractiveness evaluation of it. To be more precise, the easier a stimulus is to process, the more it is liked (for a review, see Reber et al., 2004). Furthermore, processing fluency is a function of stimulus, perceiver, and context variables (Schwarz, 2017). For example, the harmony variable symmetry can increase the speed and accuracy of processing a visual (Reber et al., 2004) with positive influence on attractiveness evaluation. Amongst other possible factors, the perceiver variables include biological gender. In other words, based on selectivity hypothesis, how fluently visual harmony or disharmony can be processed depends on processing strategies which differ between males and females (Meyers-Levy & Loken, 2015). These differences could lead to an easier fluency experience and therefore to higher attractiveness evaluation of visual harmony for females than for males.

5.3.3 Method

Recruited from a German consumer panel, sixty consumers ($M_{\text{age}} = 25$ years, $SD = 3.61$, 50 percent females) participated in a laboratory experiment employing a 2 (harmony: low vs. high) x 2 (respondent sex: female vs. male) mixed factorial design with harmony as within-subjects factor and sex as between-subjects factor. Participants viewed three of six randomly assigned stimuli (see Table 11). Subsequently, they submitted scores on attractiveness (Hirschman, 1986; $\alpha = .94$, $M = 3.63$, $SD = 1.70$), fluency (Landwehr et al., 2011; $\alpha = .82$, $M = 4.61$, $SD = 1.40$), and visual harmony (Kumar & Garg, 2010; $\alpha = .90$, $M = 4.58$, $SD = 1.71$). The survey concluded with participants' ratings on personal information such as design acumen (Bloch et al., 2003; $\alpha = .87$, $M = 4.20$, $SD = 1.36$), loneliness (Russell, 1996; $\alpha = .88$,

$M = 2.58$, $SD = .98$), age, sex, and gender identity (Choi et al., 2009; feminine identity: $\alpha = .91$, $M = 5.21$, $SD = .98$; masculine identity: $\alpha = .85$, $M = 4.70$, $SD = .88$). More precisely, in line with past research on gender identity (Bem, 1974; Barak & Stern, 1985/86), seven-point summated ratings scale assessed the degree to which a person indicates having masculine and feminine personality characteristics. The self-descriptive items for the scale were taken from the 20-item short-form of the Bem Sex-Role Inventory (BSRI: Bem, 1974; Choi et al., 2009). The short form of the BSRI contains half as many items as the long form and yet has often demonstrated better reliability and validity (Barak & Stern, 1985/86) (see Appendix B for full information on scale items and statistics). Consistent with Study 3 and to better isolate the effect of respondent sex, design acumen as a key component of the CVPA construct (Bloch et al., 2003) was included as a covariate in the moderated mediation model. In addition, attachment theory has emphasized the need of lonely individuals to seek harmony and to form (interpersonal) relationships (Baumeister & Leary, 1995). Hence, the construct of loneliness worked as a covariate as well.

5.3.4 Results

Manipulation check

As expected, an ANOVA revealed a significant effect of experimental manipulations on perceived harmony ($F(1, 177) = 87.97$, $p < .001$), with the stimuli selected to represent high harmony scoring higher ($M = 5.55$, $SD = 1.31$) than stimuli selected to represent low harmony ($M = 3.59$, $SD = 1.48$).

Mediation analysis

To test whether fluency mediates the influence of harmony on attractiveness (H5), I conducted a simple mediation analysis (Hayes, 2013, PROCESS model 4).

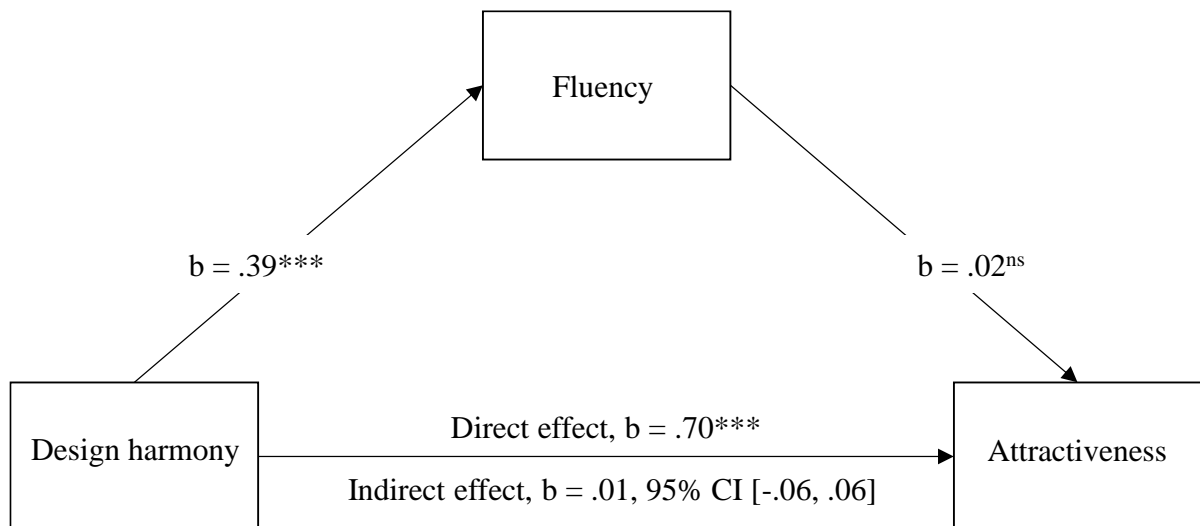


Figure 11: Testing design harmony as a predictor of attractiveness, mediated by fluency

Notes: Unstandardized regression coefficients are reported. CI = Confidence Interval; *** $p < .001$, ns = not significant.

The results (see Figure 11) indicated a nonsignificant indirect (but a direct) effect of design harmony on attractiveness evaluation through fluency (Bootstrap [5000]; $b = .01$, $SE = .03$, 95% CI [-.06, .06]). In line with previous studies, design harmony positively predicted attractiveness ($b = .69$, $t = 11.26$, $p < .001$). Design harmony was also related to higher fluency ($b = .39$, $t = 7.15$, $p < .001$), but fluency did not impact the evaluative outcome ($b = .02$, $t = .20$, $p = .844$). Accordingly, Hypothesis 5 could not be confirmed.

Moderated mediation of respondent sex

Nevertheless, to test the hypothesis that fluency might mediate the harmony-attractiveness relationship as a function of respondent sex (H7a), especially with females, I employed moderated mediation analysis (Hayes, 2013, PROCESS model 59; number of bootstrap samples = 5000) with perceived harmony as independent variable, fluency as mediator, attractiveness as dependent variable, and respondent sex (1 = female, 2 = male) as moderator. To better isolate the impact of respondent sex, covariates included respondent age, design acumen, loneliness, and gender identity. All continuous variables (with the exception of the outcome) were mean-centered to improve the interpretability of various parameters in models that include interaction terms (Aiken & West, 1991; Hayes, 2013).

In general, the index of moderated mediation serves as a formal test of moderated mediation (Hayes, 2015). A 95% bootstrap confidence interval for this index was -0.11 to 0.15. As this confidence interval included zero, findings indicated no moderated mediation

effect. Furthermore, results for conditional indirect effects showed no significant indirect influence of visual harmony on attractiveness through fluency for both females ($b = .00$, $SE = .04$, 95% CI [-.09, .08]) and males ($b = .02$, $SE = .05$, 95% CI [-.07, .11]). Taken together, Hypothesis 7a could not be confirmed.

Moderated mediation of gender identity

To test gender identity as an alternative moderator, I conducted moderated mediation analysis (Hayes, 2013, PROCESS model 76; number of bootstrap samples = 5000) with respondent sex, respondent age, design acumen, and loneliness as covariates and both feminine and masculine identity as moderators. As before, continuous variables were mean-centered (Hayes, 2013). Table 12 holds all results on the moderating effects of feminine and masculine identity.

Results indicated that masculine identity significantly interacted with a design's harmony to influence processing fluency ($b = .13$, $t = 2.04$, $p = .043$) (see Table 12). To shed further light on the nature of this interaction effect, I applied procedures for plotting simple slopes [using the PROCESS SPSS macro supplied by Hayes (2013)] at one standard deviation above and below the mean of the masculine identity measure (Spiller et al., 2013). As can be seen in Figure 12, the positive interaction effect indicated that individuals with a more masculine identity processed visual harmony more fluently ($b_{\text{simple slope}} = .52$, $t = 6.96$, $p < .001$) than individuals with a less masculine identity ($b_{\text{simple slope}} = .26$, $t = 3.16$, $p = .002$), but without an impact on attractiveness evaluation. In contrast to the moderating effect of masculine identity, the interaction effect between visual harmony and feminine identity on fluency was not significant ($b = .08$, $t = 1.28$, $p = .202$).

Furthermore, results indicated that the cross-term between visual harmony and feminine identity related to attractiveness was significant ($b = .15$, $t = 2.29$, $p = .023$). Figure 13 shows that the relationship between visual harmony and attractiveness was relatively strong (and positive) at higher levels ($M + SD$) of feminine identity ($b_{\text{simple slope}} = .82$, $t = 11.00$, $p < .001$), whereas the effect was less pronounced at lower levels ($M - SD$) of feminine identity ($b_{\text{simple slope}} = .53$, $t = 6.18$, $p < .001$). In other words, individuals exhibiting a more feminine identity indicated to find visual harmony more attractive than individuals with a less feminine identity.

Table 12: Testing for moderated mediation of feminine and masculine identity

Predictor	b	SE	t
Fluency, adj. R² = .32, F(9, 161) = 8.52, p < .001			
Visual harmony	.38 ^{***}	.06	6.92
Feminine identity	.12 ^{ns}	.10	1.19
Visual harmony x Feminine identity	.08 ^{ns}	.06	1.28
Masculine identity	.26 [*]	.13	2.05
Visual harmony x Masculine identity	.13 [*]	.07	2.04
Respondent sex	-.03 ^{ns}	.20	-.16
Respondent age	-.04 ^{ns}	.03	-1.45
Design acumen	.13 ^{ns}	.07	1.74
Loneliness	.13 ^{ns}	.12	1.12
Attractiveness, adj. R² = .52, F(12, 158) = 14.19, p < .001			
Fluency	-.01 ^{ns}	.08	-.15
Visual harmony	.68 ^{***}	.07	10.57
Feminine identity	-.12 ^{ns}	.11	-1.09
Fluency x Feminine identity	-.04 ^{ns}	.09	-.48
Visual harmony x Feminine identity	.15 [*]	.07	2.29
Masculine identity	.07 ^{ns}	.14	.52
Fluency x Masculine identity	-.04 ^{ns}	.10	-.44
Visual harmony x Masculine identity	.05 ^{ns}	.07	.74
Respondent sex	.03 ^{ns}	.20	.17
Respondent age	.03 ^{ns}	.03	.98
Design acumen	-.07 ^{ns}	.08	-.85
Loneliness	-.02 ^{ns}	.12	-.16

Notes: Unstandardized regression coefficients are reported. adj. = adjusted; ^{***} p < .001, ^{*} p < .05, ns = not significant.

Table 13: Conditional indirect effects of visual harmony on attractiveness through fluency at values of feminine and masculine identity

Feminine identity	Masculine identity	b	Boot SE	LL 95% CI	UL 95% CI
- 1 SD (-.99)	- 1 SD (-.88)	.01	.03	-.03	.08
- 1 SD (-.99)	M (.00)	.01	.04	-.07	.08
- 1 SD (-.99)	+ 1SD (.88)	.00	.08	-.20	.12
M (.00)	- 1 SD (-.88)	.01	.03	-.06	.07
M (.00)	M (.00)	-.01	.03	-.07	.06
M (.00)	+ 1SD (.88)	-.02	.07	-.18	.08
+ 1SD (.99)	- 1 SD (-.88)	-.01	.06	-.15	.10
+ 1SD (.99)	M (.00)	-.02	.05	-.15	.07
+ 1SD (.99)	+ 1SD (.88)	-.05	.07	-.21	.07

Notes: Unstandardized regression coefficients are reported. LL = Lower Limit, UL = Upper Limit, CI = Confidence Interval.

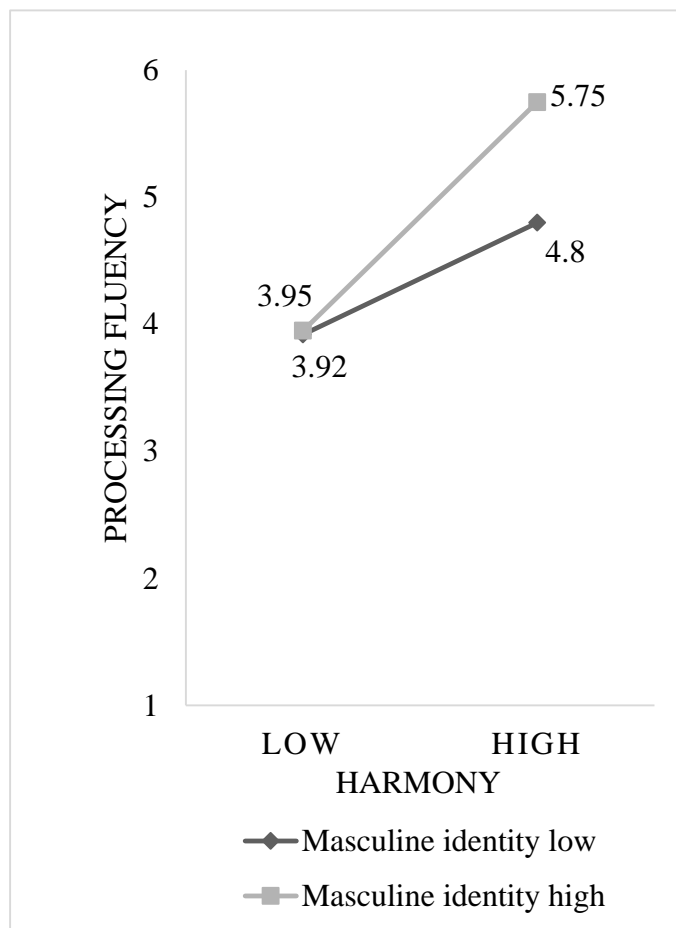


Figure 12: Effect of masculine identity on the design harmony-fluency relationship

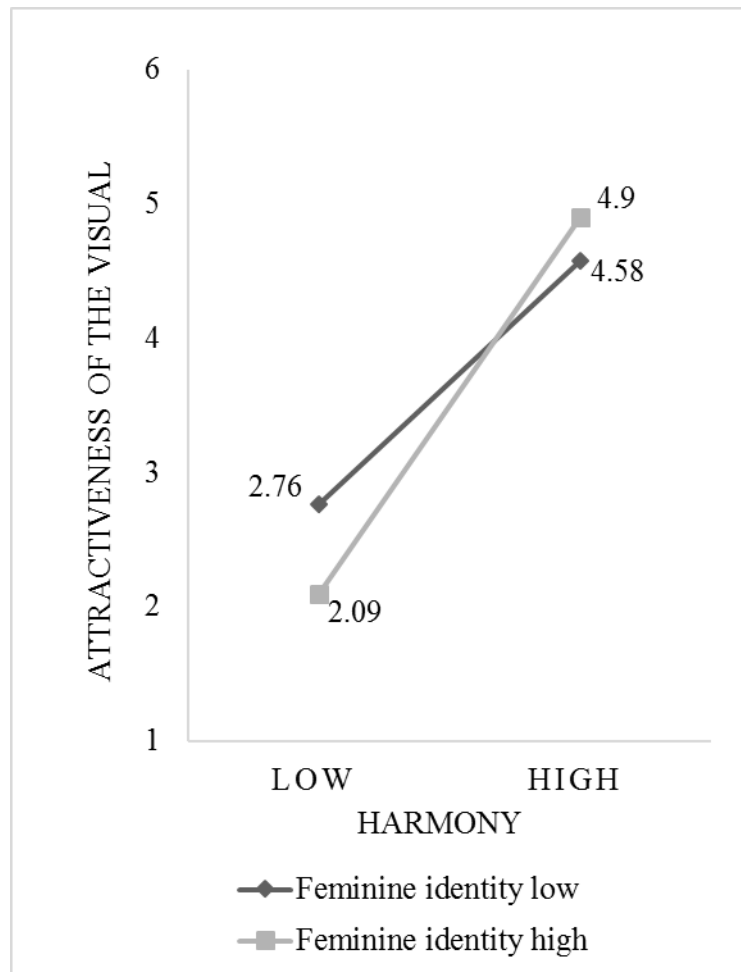


Figure 13: Effect of feminine identity on the design harmony-attractiveness relationship

However, consistent with Hypothesis 7b, all of the 95% bootstrap confidence intervals for the conditional indirect effect at different values of feminine and masculine identity ($M \pm SD$) included zero, confirming that neither feminine nor masculine identity moderated the indirect effect of visual harmony on attractiveness through fluency (see Table 13).

5.3.5 Discussion

The objective of Study 4 was to extend previous studies by investigating a possible underlying mechanism which could clarify the harmony-attractiveness relationship. In summary, findings suggest that the influence of visual harmony on attractiveness evaluation could not be traced back to processing fluency.

Moreover, as respondent sex does not work as moderator in the moderated mediation model, gender identity seems to be a better predictor of design preferences than the biological distinction between females and males. Results show that, congruent with its associated personality traits, a feminine gender identity enhances the effect of visual harmony on attractiveness evaluation. Interestingly and not fully in line with expectations, individuals with a more masculine identity process visuals high in harmony more fluently than individuals with a less masculine identity. A possible reason for a nonsignificant effect could lie in the use of an explicit measure of fluency (Landwehr et al., 2011) instead of a sensor technology such as eye-tracking.

However, Study 5 will focus on self-congruity as an alternative underlying mechanism which helps to explain the relationship between visual harmony and attractiveness evaluation and explore the role of gender identity. In the case of self-congruity theory, I assume that gender identity – more than biological sex – influence the evaluation of design harmony.

5.4 Study 5: Clarifying Underlying Mechanisms II: Congruity with the Self

5.4.1 Objective

Because Study 4 findings indicates that processing fluency does not seem to explain the link between harmony and attractiveness, Study 5 tests an integrated moderated mediation model to better understand the workings of design harmony from a more social-oriented perspective. The mediator part of the model examines the role of self-congruity in the design harmony-attractiveness relationship (H6). As Study 4 highlights the role of gender identity as opposed to sex, the moderator part focuses on gender identity as a moderator of the harmony-self-congruity relationship (H8a). Respondent sex is included as an alternative moderator (H8b).

5.4.2 Theoretical Background

This study examines self-congruity as a possible explanatory mechanism. Marketing stimuli and their design can serve as cues to symbolically position oneself in line with self-congruity (Sirgy, 1982) and cognitive consistency theories (Festinger, 1957; Heider, 1946), suggesting that individuals with specific personality traits favor design with similar personality to their own. This ‘like attracts like’ tendency is crucial for maintaining psychological well-being and to keep a positive view of our self (Suh, 2002). Moreover, consumers establish and maintain close bonds with marketing visuals that communicate a favorable self to relevant others (Hassenzahl, 2008). Hence, because consumers are strongly motivated to maintain their self-concept (Baumeister, 1986), they will evaluate design harmony as more attractive when it is more congruent with their self-concept. Following previous research on design characteristics of visual harmony (e.g., roundness: Jiang et al., 2016), it is expected that harmony may be associated with impressions of femininity, whereas disharmony may be associated with masculinity. Moreover, based on reports that both males and females develop gender identities for themselves (Ward & Broniarczyk, 2011), I expect that gender identity as a specific and central component of the self (Feiereisen et al., 2009) will interact with a design’s visual harmony to influence self-congruity. More precisely, visual harmony should appeal more to individuals with a more rather than less feminine identity as harmony including its associations should be more congruent with feminine

personality traits. In contrast, individuals with a masculine identity should respond more positively to visuals low in harmony.

5.4.3 Method

Ninety-one students ($M_{\text{age}} = 22.7$ years, $SD = 2.74$, 56 percent females) from a large university on the U.S. West Coast participated in this study. An online survey presented participants with an introductory text before they viewed three of six randomly assigned stimuli (see Table 11) and submitted ratings on attractiveness, masculine (i.e., masculine personality traits; Choi et al., 2009) and feminine appeal of the stimulus (i.e., feminine personality traits; Choi et al., 2009) to provide a measure of self-congruity, visual harmony and gender identity. Demographic data (sex and age) were collected at the end (see Appendix B for more details).

Dependent and independent measures

Attractiveness was assessed using Hirschman’s (1986) three-item semantic differentials ($\alpha = .87$, $M = 4.04$, $SD = 1.68$). I assessed visual harmony using two items that captured whether “the elements of this design form a coherent, unified whole” and “the design looks harmonious” (Kumar & Garg, 2010; $\alpha = .84$, $M = 4.54$, $SD = 1.68$).

Self-congruity measure

Congruity between the visuals and participants’ self-concept was assessed using a traditional indirect measure which is the most popular method and best predicts preferences (Sirgy & Samli, 1985). First, participants rated their perception of each visual (i.e., strong, dominant, aggressive, warm, tender, and gentle; Choi et al., 2009). Next, they rated their self-concept using the same characteristics. An indirect measure of self-congruity was computed by using a discrepancy score (Sirgy et al., 1997) applying the equation below:

$$\sum_{i=1}^n |P_i - S_i| \quad \text{where}$$

P_i = rating of stimuli (personality) along dimension i (i.e., strong, dominant, aggressive, warm, tender, and gentle) and

S_i = rating of self along dimension i (i.e., strong, dominant, aggressive, warm, tender, and gentle)

As such, small absolute values indicate a high degree of congruity, whereas large discrepancy values indicate low congruity between the visual and a person's self-concept (Kressmann et al., 2006).

Gender identity measure

In line with past research (Bem, 1974; Barak & Stern, 1985/86) and Study 4, seven-point summated ratings scale assessed the degree to which a person indicates having masculine and feminine personality traits. Consistent with Study 4, the self-descriptive items for the scale were taken from the more valid and reliable 20-item short-form of the Bem Sex-Role Inventory (BSRI: Bem 1974; Choi et al., 2009). Despite significant social change over past 30 years, several recent studies using the BSRI suggest that gender stereotypes have remained stable since the scale was developed (Fisher & Dubé, 2005).

5.4.4 Results

Description of stimuli

Six, independent 2 (harmony: low vs. high) x 3 (marketing stimuli: logo vs. typeface vs. kettle) 2 (gender: female vs. male) three-way ANOVAs with warm, tender, gentle, strong, dominant, and aggressive as dependent variables, respectively, were conducted. For warm, tender, gentle, and aggressive, the main effect of harmony was significant ($F(1, 261)_{\text{warm}} = 50.66, p < .001$; $F(1, 261)_{\text{tender}} = 40.87, p < .001$; $F(1, 261)_{\text{gentle}} = 79.00, p < .001$; $F(1, 261)_{\text{aggressive}} = 45.02, p < .001$). In contrast, for strong and dominant, the main effect of harmony was not significant ($F(1, 261)_{\text{strong}} = .82, p = .365$; $F(1, 261)_{\text{dominant}} = .63, p = .427$). In other words, visual harmony projected associations with warmth, gentleness, and tenderness, whereas a lack of harmony induced associations with aggressiveness but not dominance and strength (see Table 14). Because no significant main effects of respondent sex ($p > .05$) and no significant interaction effects of respondent sex and visual harmony ($p > .05$) were observed, these associations are valid for both sexes.

Table 14: Description of stimuli along dimension i (i.e., warm, tender, gentle, strong, dominant, and aggressive)

Dimension	Typeface		Logo		Product		Total	
	low	high	low	high	low	high	low	high
Warm	2.40 (1.76)	4.70 (1.80)	2.38 (1.56)	4.37 (1.82)	4.16 (1.86)	4.61 (1.86)	2.98 (1.91)	4.56 (1.82)
Tender	2.51 (1.93)	4.70 (1.72)	2.71 (1.84)	4.11 (1.66)	3.22 (1.84)	3.65 (1.75)	2.82 (1.79)	4.15 (1.75)
Gentle	1.82 (1.54)	5.09 (1.62)	2.80 (1.87)	4.48 (1.59)	3.73 (1.72)	4.17 (1.66)	2.79 (1.87)	4.58 (1.66)
Strong	5.02 (1.63)	3.39 (1.61)	3.40 (1.98)	3.89 (1.68)	4.58 (1.59)	5.09 (1.47)	4.33 (1.86)	4.12 (1.73)
Dominant	4.76 (1.71)	3.41 (1.67)	3.29 (1.83)	3.72 (1.72)	4.00 (1.57)	4.35 (1.65)	4.02 (1.79)	3.83 (1.71)
Aggressive	5.82 (1.23)	3.13 (1.92)	3.62 (1.89)	2.65 (1.45)	3.76 (1.89)	3.28 (1.86)	4.40 (1.97)	3.02 (1.76)

Notes: Standard deviations are in the parentheses.

Manipulation check

Analysis of variance indicated a significant effect of experimental manipulations on perceived harmony ($F(1, 272) = 46.61, p < .001$), with the stimuli selected to represent high harmony scoring higher ($M = 5.17, SD = 1.36$) than stimuli selected to represent low harmony ($M = 3.88, SD = 1.73$). The manipulation of harmony can be considered successful.

Sex differences in personality traits

An independent t-test revealed that females scored significantly higher on the feminine identity factor ($M = 5.66, SD = .63$) than males ($M = 5.39, SD = 1.01, t(271) = 2.68, p = .008$), whereas no differences were found between males and females on the masculine identity factor ($M_{\text{female}} = 5.10, SD = .85, M_{\text{male}} = 5.22, SD = .91, t(271) = -1.13, p = .259$).

Mediation analysis

It was expected that congruity between the visuals and participants' self-concept would mediate the relationship between design harmony and attractiveness evaluation (H6). To test this prediction, I conducted simple mediation analysis (Hayes, 2013, PROCESS model 4). Consistent with Study 4, all continuous variables (with the exception of the outcome) were mean-centered to increase the interpretability of various parameters in models that include interaction terms (Aiken & West, 1991; Hayes, 2013). Figure 14 shows, as hypothesized, the

link between visual harmony and attractiveness was significantly mediated by self-congruity (Bootstrap [5000]; $b_{\text{indirect}} = .14$, $SE = .03$, 95% CI [.09, .21]).

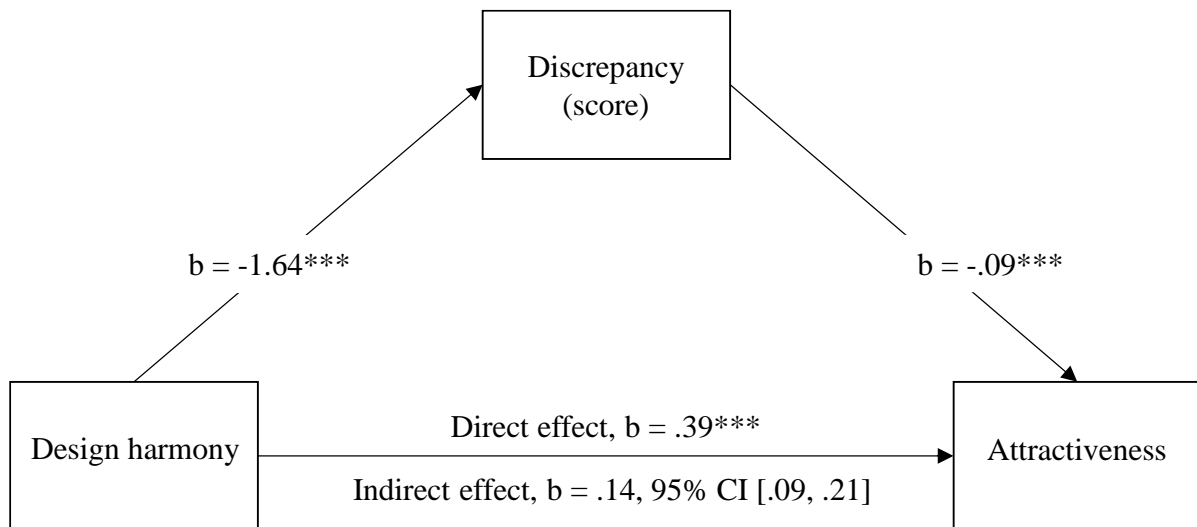


Figure 14: Testing design harmony as a predictor of attractiveness, mediated by discrepancy

Notes: Unstandardized regression coefficients are reported. CI = Confidence Interval; *** $p < .001$.

More specifically, design harmony had a negative effect on the discrepancy between self-concept and visual rating ($b = -1.64$, $t = -7.91$, $p < .001$). Discrepancy between self-concept and visual also negatively affected attractiveness evaluation ($b = -.09$, $t = -6.16$, $p < .001$). In other words, the greater the discrepancy scores (lower self-congruity), the greater the mismatch between the visual and the self, and the lower the attractiveness.

Moderated mediation analysis of gender identity

To test Hypothesis 8a and hence the prediction that the mediating effect of self-congruity might vary systematically as a function of gender identity, an important component of the self-concept, I integrated the proposed moderators (feminine and masculine identity) into the simple mediation model to empirically test the overall moderated mediation hypothesis (Hayes, 2013, PROCESS model 10; number of bootstrap sample = 5000) with visual harmony as independent variable, discrepancy as mediator, attractiveness as dependent variable, and respondent age and sex (1 = female, 2 = male) as covariates. Table 15 holds the results.

Table 15: Testing for moderated mediation of feminine and masculine identity

Predictor	b	SE	t		
Discrepancy, adj. R² = .31, F = 5.32, p < .001					
Visual harmony	-1.73 ^{***}	.42	-4.14		
Feminine identity	1.27 ^{ns}	.75	1.68		
Visual harmony x Feminine identity	-1.40 [*]	.58	-2.41		
Masculine identity	1.13 ^{ns}	.78	1.45		
Visual harmony x Masculine identity	1.15 [*]	.50	2.30		
Respondent sex	-.43 ^{ns}	1.27	-.34		
Respondent age	.21 ^{ns}	.23	.91		
Attractiveness, adj. R² = .48, F = 9.61, p < .001					
Discrepancy	-.12 ^{***}	.02	-5.15		
Visual harmony	.30 ^{**}	.10	3.05		
Feminine identity	.30 ^{ns}	.17	1.78		
Visual harmony x Feminine identity	-.01 ^{ns}	.13	-.10		
Masculine identity	.28 ^{ns}	.17	1.65		
Visual harmony x Masculine identity	.19 ^{ns}	.11	1.73		
Respondent sex	-.25 ^{ns}	.28	-.90		
Respondent age	-.10 [*]	.05	-2.10		
Conditional indirect effects at values of feminine and masculine identity					
Feminine identity	Masculine identity	b	Boot SE	LL 95% CI	UL 95% CI
- 1 SD (-.86)	- 1 SD (-.83)	.18	.12	-.03	.45
- 1 SD (-.86)	M (.00)	.06	.11	-.16	.32
- 1 SD (-.86)	+ 1SD (.83)	-.05	.16	-.35	.31
M (.00)	- 1 SD (-.83)	.33	.10	.17	.57
M (.00)	M (.00)	.21	.07	.11	.39
M (.00)	+ 1SD (.83)	.10	.11	-.08	.38
+ 1SD (.86)	- 1 SD (-.83)	.48	.15	.23	.85
+ 1SD (.86)	M (.00)	.36	.12	.18	.67
+ 1SD (.86)	+ 1SD (.83)	.24	.13	.02	.52
Index for moderated mediation (feminine identity)		.17	.11	.02	.49
Index for moderated mediation (masculine identity)		-.14	.10	-.36	.03

Notes: Unstandardized regression coefficients are reported. LL = Lower Limit, UL = Upper Limit, CI = Confidence Interval; *** p < .001, ** p < .01, * p < .05, ns = not significant.

To shed light on the nature of the significant interaction effect between visual harmony and feminine identity on discrepancy ($b = -1.40$, $t = -2.41$, $p = .018$, see the upper half of Table 15), I applied procedures for plotting simple slopes [using the PROCESS SPSS macro supplied by Hayes (2013)] at one standard deviation above and below the mean of the feminine identity measure (Spiller et al., 2013). As can be seen in Figure 15, the relationship between visual harmony and discrepancy was relatively strong (and negative) at higher levels ($M + SD$) of feminine identity ($b_{\text{simple slope}} = -2.20$, $t = -5.83$, $p < .001$), whereas the effect was less pronounced at lower levels ($M - SD$) of feminine identity ($b_{\text{simple slope}} = -1.06$, $t = -2.49$, $p = .013$). In other words, individuals exhibiting a more feminine identity indicated to be more incongruent with low visual harmony than individuals with a less feminine identity.

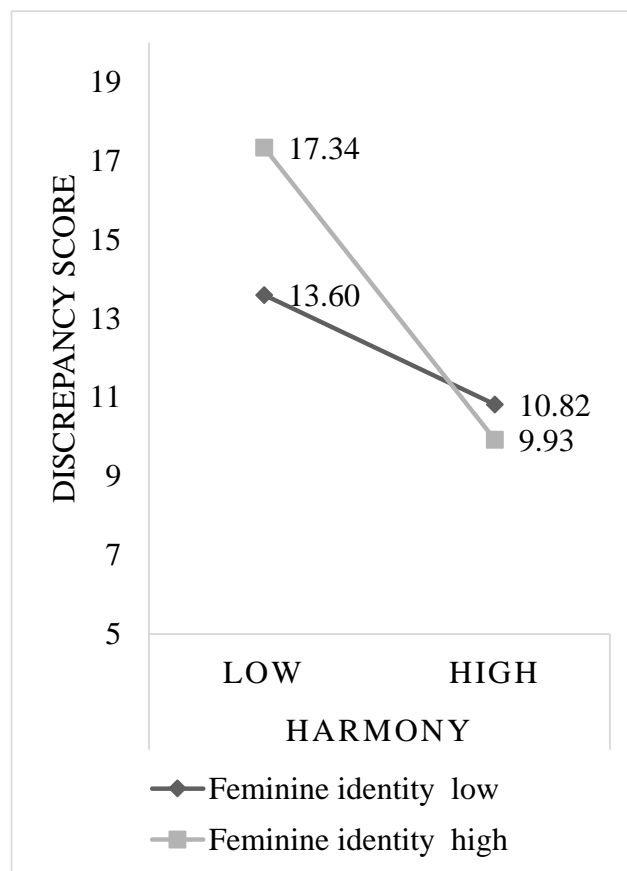


Figure 15: Effect of feminine identity on the design harmony-discrepancy relationship

In addition, Figure 16 displays a simple slope analysis (Hayes, 2013) to illustrate harmony's influence on attractiveness at different values of masculine identity ($M + SD$, $M - SD$). Results indicate that the relationship between visual harmony and discrepancy was relatively strong (and negative) at lower levels of masculine identity ($b_{\text{simple slope}} = -2.45$, $t = -4.00$, $p = .001$), whereas the effect was less pronounced at higher levels of masculine identity ($b_{\text{simple slope}} = -1.28$, $t = -2.35$, $p = .021$). The findings further underline that individuals

exhibiting a more masculine identity were less congruent with high visual harmony than individuals with a less masculine identity.

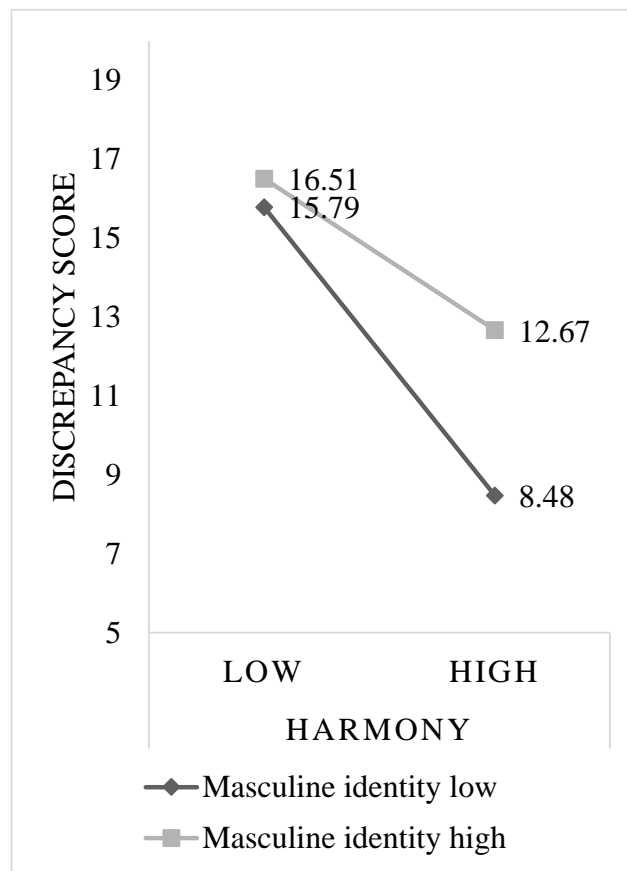


Figure 16: Effect of masculine identity on the design harmony-discrepancy relationship

Although the results showed that both a feminine identity and a masculine identity interacted with design harmony, they did not directly assess the conditional indirect effects model (H8a). Therefore, I examined the conditional indirect effect of visual harmony on attractiveness through discrepancy at different values of feminine and masculine identity (see lower half of Table 15): the mean, one standard deviation above the mean, and one standard deviation below the mean. Results support Hypothesis 8a such that the indirect effect of a design's harmony on participants' evaluation of attractiveness through discrepancy was stronger at higher levels of feminine identity with the strongest conditional indirect effect for individuals holding a high feminine identity ($M + SD$) and a low masculine identity ($M - SD$) ($b = .48, SE = .15, 95\% CI [.23, .85]$). The effect was nonsignificant at low levels of feminine identity. Furthermore, in the case of feminine identity, a 95% bootstrap confidence interval for the index of moderated mediation (formal test of moderated mediation: Hayes, 2015) was 0.02 to 0.49. As this confidence interval did not include zero, the conclusion was that the indirect effect of visual harmony on attractiveness evaluation through self-congruity (i.e.,

discrepancy) was moderated by feminine personality traits. In contrast, the index of moderated mediation for masculine identity included zero (95% CI [-.36, .03]), indicating no moderating effect of masculine personality traits.

Moderated mediation analysis of respondent sex

To further substantiate the claim that adopting a gender identity-self-congruity perspective allows for better explaining consumer response to visual design than focusing on the biological distinction between males and females, respondent sex was examined as an alternative moderator. Results indicated that the cross-term between visual harmony and respondent sex related to discrepancy and attractiveness, respectively, was not significant. A 95% bootstrap confidence interval for the index of moderated mediation included zero (-0.08 to 0.10), and thus the indirect effect did not depend on respondent sex (see Table 16).

Table 16: Testing for moderated mediation of respondent sex

Predictor	b	SE	t	
Discrepancy, adj. R² = .19, F(4, 268) = 15.77, p < .001				
Visual harmony	-1.67***	.21	-7.91	
Respondent sex	-.62 ^{ns}	.72	-.87	
Visual harmony x Respondent sex	-.15 ^{ns}	.43	-.35	
Respondent age	.05 ^{ns}	.13	.41	
Attractiveness, adj. R² = .38, F(5, 267) = 32.10, p < .001				
Discrepancy	-.09***	.01	-6.09	
Visual harmony	.39***	.05	7.24	
Respondent sex	.03 ^{ns}	.17	.20	
Visual harmony x Respondent sex	.09 ^{ns}	.10	.94	
Respondent age	-.02 ^{ns}	.03	-.53	
	b	Boot SE	LL 95% CI	UL 95% CI
Mediator	Conditional indirect effect at values of biological gender			
Discrepancy				
Females	.14	.04	.07	.22
Males	.15	.04	.08	.25
Index of moderated mediation	.01	.04	-.08	.10

Notes: Unstandardized regression coefficients are reported. LL = Lower Limit, UL = Upper Limit, CI = Confidence Interval; *** p < .001, ns = not significant.

5.4.5 Discussion

The aim of Study 5 was to clarify the process connecting visual harmony with attractiveness, and to test an alternative explanation based on differences between males and females that was found in Studies 2 and 3. Study 5 demonstrated that visual harmony projected associations with warmth, gentleness, and tenderness, whereas a lack of harmony induced associations with aggressiveness. In addition, I found that congruity between consumers' self-concept and the visual mediated the effect of visual harmony on attractiveness. In other words, consumers are attracted to marketing objects because their identity matches characteristics of marketing visuals. This mediating effect was moderated by a feminine identity, whereas masculine identity had no effect. Specifically, the indirect effect of visual harmony on attractiveness through self-congruity was stronger at high levels of feminine identity which is associated with a sense of belonging and social harmony. Respondent sex did not moderate the harmony-self-congruity relationship and the indirect effect of visual harmony on attractiveness through self-congruity. It indicates that biological gender is not a meaningful variable to explain attractiveness evaluation through the mechanism of self-congruity (with U.S. students). One possible explanation for this outcome may be the role of social factors.

To shed light on the role of social expectations in gendered responses, Study 6 extends previous studies by investigating implicit associations with visual harmony and by exploring gender identity- and sex-based differences in these implicit harmony constructs.

5.5 Study 6: Assessing Sex and Gender Identity Effects Based on Multi-Dimensional Implicit Harmony Associations

5.5.1 Objective

The aims of Study 6 are threefold. First, Study 6 tests implicit associations with visual harmony. To be more precise, I predict that harmony will be associated with words expressing attractiveness, and self-identity, and with female names. In contrast, disharmony will be associated with words expressing unattractiveness and others, and with male names (H9a-c). Second, relationships among these implicit harmony constructs are investigated by testing correlations between implicit attractiveness evaluation, implicit identification, implicit gender stereotypes, and implicit gender identity (H10a and H10b). Third, while previous studies focused on explicit measures, this study aims at exploring sex- and gender identity-related differences in implicit associations with visual harmony (H11a and H11b).

5.5.2 Theoretical Background

Past research on stereotype congruity of visuals (Fisher & Dubé, 2005) has shown that social expectations can play a role in consumer response to visuals. Accordingly, past experiences in terms of social feedback received will mediate favorable or unfavorable feelings, thoughts, or action toward harmonious (disharmonious) design (Greenwald & Banaji, 1995). In addition, using explicit measures implies that study participants have already formed an opinion, are aware of their own identity (e.g., gender identity), and willing to share it. Past research nominated the IAT as a powerful and flexible procedure for assessing nonconscious and automated thoughts, attitudes, beliefs, and personality traits (Greenwald et al., 1998), hence avoiding the limitations associated with explicit measures. Addressing the limitations inherent in the explicit nature of measurements in previous studies, Study 6 measures implicit harmony evaluation (IAT 1), harmony gender stereotypes (IAT 2), harmony identity (IAT 3), and gender identity (IAT 4) to explore relationships among these constructs from a non-conscious perspective.

5.5.3 Method











Sixty students ($M_{\text{age}} = 24.9$ years, $SD = 3.61$, 50 percent females) were recruited at a public German university and rewarded with a voucher to the value of 5€. All participants had normal or corrected-to-normal vision. In a novel procedure, the entire laboratory experiment

required respondents to first complete a series of four IATs (visual harmony - attractiveness, visual harmony - gender stereotype, visual harmony - identity, and gender - identity) and later a questionnaire including explicit measures of gender identity and demographic data (identical to those included in both Study 4 and Study 5). The author supervised the collection of data by a research assistant.

Materials

A pretest yielded the set of stimuli I used for this task of the IAT study. Ten marketing and design professionals evaluated the perceived fit between a set of stimuli (17 words for attractive, 12 words for unattractive, 11 pictures for harmony, 11 pictures for disharmony) and the corresponding categories, using a seven-point semantic differential scale ranging from bad fit (1) to good fit (7). Table 17 represents the 10 pictures and 10 words that were used for the IATs and their pretest scores.

Table 17: Stimuli used to represent target and attribute categories (visual harmony - attractiveness IAT)

Target Category Harmony MW (SD)	Target Category Disharmony MW (SD)	Attribute Category Attractive MW (SD)	Attribute Category Unattractive MW (SD)
 6.4 (.70)	 6.3 (.82)	beautiful 6.7 (.48)	unaesthetic 6.2 (.92)
 5.6 (.84)	 6.1 (.74)	aesthetic 6.4 (.70)	plain 5.7 (1.49)
 5.1 (1.20)	 5.8 (1.03)	pretty 6.1 (1.20)	repulsive 5.3 (1.49)
 4.9 (1.10)	 5.8 (1.24)	appealing 6.0 (.82)	charmless 5.1 (1.91)
 4.8 (1.32)	 5.3 (1.25)	desirable 6.0 (1.05)	abhorrent 4.7 (1.57)

Notes: Ratings (n = 10): 7 = good fit; 1 = bad fit.

Visual harmony - attractiveness IAT (IAT 1)

To assess the strength of implicit associations between harmony and attractiveness, IAT 1 used 5 harmonious (e.g., yin-yang symbol) and 5 disharmonious (e.g., random pattern) images

as target categories, and employed ten words representing “attractive” (e.g., *beautiful*) versus “unattractive” (e.g., *unaesthetic*) (see Table 17 for more information).

Visual harmony - gender stereotype IAT (IAT 2)

The harmony - gender stereotype IAT used 5 male (e.g., *Daniel*) and 5 female (e.g., *Julia*) names to represent the attribute categories masculine and feminine (Rudman et al., 2001). The stimuli for harmony and disharmony were identical to the ones used for IAT 1. A strong female-gender stereotype was evident if responses were faster with harmony and female pairings (along with disharmony and male) as opposed to harmony and male pairings (along with disharmony and female).

Visual harmony - identity IAT (IAT 3)

The self-other dimension required participants to distinguish between words that represented the self (e.g., *me*) and others (e.g., *they*) (Karpinski, 2004). The stimuli representing the target categories harmony and disharmony were identical to those used for both IAT 1 and IAT 2. An individual who highly identified with harmony relative to disharmony should more rapidly pair harmony with self than harmony with others.

Gender – identity IAT (IAT 4)

IAT 4 was designed to assess the association strength between self (self: e.g., *me*; others: e.g., *they*) and gender (masculine: e.g., *Daniel*; feminine: e.g., *Julia*) to provide an implicit measure of gender identity.

Procedure employed for assessing implicit associations

Participants sat in front of a 19 in. 60-Hz LCD monitor to complete four IATs and a psychometric questionnaire. Both to present the stimuli and to collect data, INQUISIT Lab by millisecond was used. The computer was a Dell with a Dell Ultra Sharp 24” monitor. Participants were instructed to respond by pressing the left (“e”) and right (“i”) keys of the keyboard. In its entirety, the procedure closely followed the multidimensional IAT successfully employed by Gattol et al. (2011). I describe the procedure for the harmony - attractiveness IAT (IAT 1) in detail as an example of how each of the four IATs were conducted. Each IAT consisted of seven blocks. In the first block, participants saw harmonious and unharmonious pictures (target concept) in a random order, and they pressed

the left button (“e”) to sort the stimuli to the target category disharmony, and the right button (“i”) to sort it to the target category harmony. In the second block, the attractive and unattractive words (attribute concept) were presented, and participants responded with left button for unattractive and right button for attractive. Subsequently, there were two blocks of experimental trials. In the compatible blocks, the left button was used to report disharmony and unattractive words, while the right button was used to report harmony and attractive words (see Figure 17, A). Next, two more training blocks were presented that include only harmonious and unharmonious pictures, but the response mapping was reversed. Participants had to use the left button to report harmony, and the right button to report disharmony. These blocks were followed by two blocks of incompatible trials (left button for harmony and unattractive, right button for disharmony and attractive; see Figure 17, B). Incorrect responses were signaled with a red capital X on the screen and participants had to correct their response for the experiment to continue. Participants were instructed to make accurate responses as fast as possible. The same procedure and the same number of trials were used in IAT that tested harmony gender stereotype, harmony identity, and gender identity. Stimuli within each block and the order of the four IAT sessions were fully randomized.

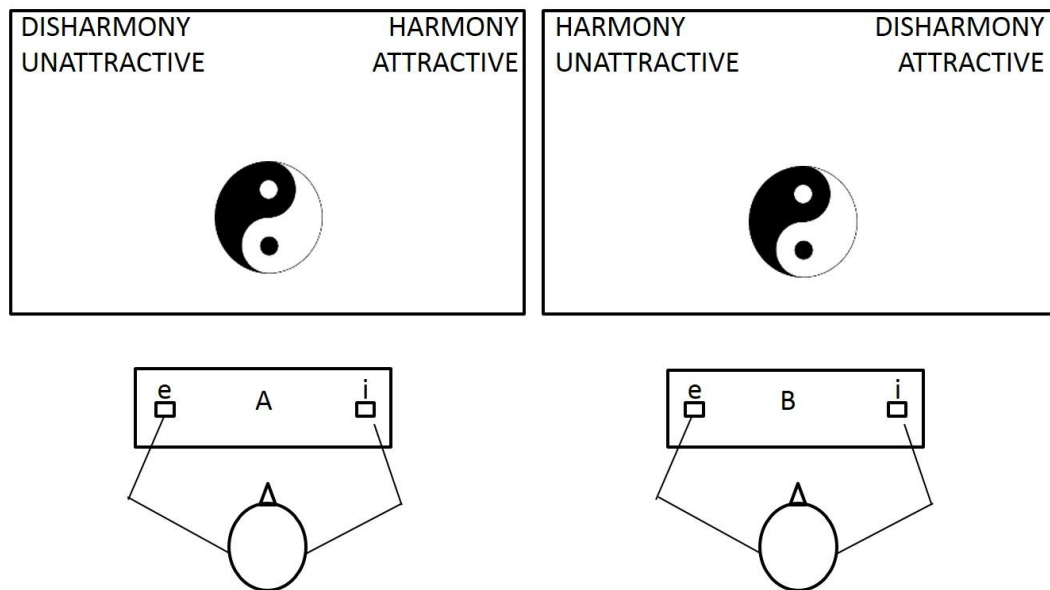


Figure 17: Schematic representation of the two IAT main blocks (harmony - attractiveness IAT)

5.5.4 Results

As mentioned above, each participant completed the four IAT sessions designed to measure implicit associations between harmony/disharmony and one other dimension

(attractiveness, gender stereotype, and self). The fourth IAT was created to measure the association between self and gender, to provide an additional implicit measure of gender identity. IAT effects (the so called *D* score: Greenwald et al. [2003]) are based on differences in reaction times between two experimental tasks: the initial combined tasks and the reversed combined tasks, divided by the standard deviation in these trials. This score was obtained for each participant and IAT, and was positive when there was an association in the predicted direction (i.e., visual harmony was considered more attractive, more feminine, and stronger associated with the self than visual disharmony). For gender identity, positive *D* values indicated a link between self and male, and negative *D* values indicated a link between self and female.

For each dimension, I first tested the values of *D* against zero to obtain evidence of whether the association was significant. In the cases of visual harmony - attractiveness (1), visual harmony - gender stereotype (2), and visual harmony - identity (3), the *D* scores were significantly greater than zero ($t_1(59) = 17.14, p < .001$; $t_2(59) = 6.79, p < .001$; $t_3(59) = 11.35, p < .001$), indicating that harmony was more strongly associated with attractiveness, femininity, and the self than with unattractiveness, masculinity, and others (see Figure 18). These findings support Hypothesis 9 (a-c).

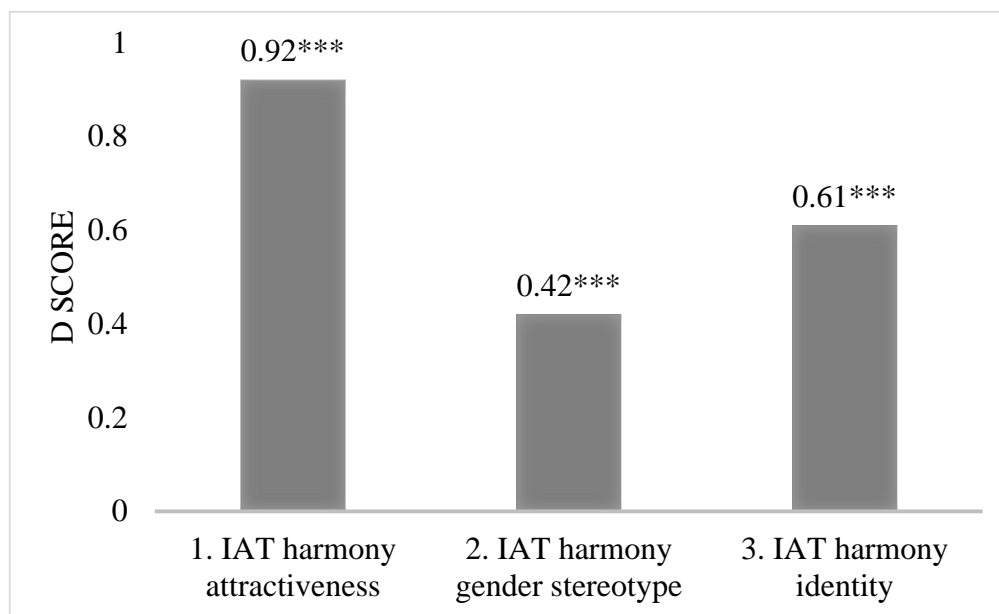


Figure 18: Implicit associations between visual harmony and attractiveness, gender stereotype, and identity

Notes: The *D* score is a measure of the strength of the association between two categories. Positive *D* scores indicate that visual harmony was more strongly associated with attractiveness, femininity, and self relative to disharmony. *** $p < .001$.

Correlation analysis on *D* scores revealed that harmony - attractiveness was significantly related to harmony - gender stereotype ($r = .25, p = .048$) and harmony - identity ($r = .25, p = .056$), suggesting that the stronger the implicit identification with harmony was, the stronger was the implicit harmony attractiveness evaluation (see Table 18). In addition, implicit gender identity was significantly correlated with both harmony - gender stereotype ($r = -.60, p = .001$) and harmony - identity ($r = -.25, p = .057$), indicating that the self-harmony association was predicted by implicit gender identity. To be more precise, the stronger the self-masculine association was, the weaker was the implicit identification with harmony. However, implicit gender identity was not related to implicit attractiveness evaluation.

Table 18: Correlations among implicit measures

Measure	harmony - attractiveness	harmony - gender stereotype	harmony - identity	gender - identity
harmony - gender stereotype	.25*	-		
harmony - identity	.25 ⁺	.11 ^{ns}	-	
gender - identity	.04 ^{ns}	-.60***	-.25 ⁺	-

Notes: *** $p < .001$, * $p < .05$, ⁺ $p < .10$, ns = not significant.

Building on and extending Study 5 and investigating the influence of sex and explicit feminine identity, the main aim of the md-IAT was to determine whether implicit attitudes towards harmony and identification with harmony differ between males and females and between individuals with a more feminine identity and individuals with a less feminine identity. The measure of feminine identity was identical to that in Study 4 and Study 5 (Choi et al. 2009; $\alpha = .91, M_{\text{fem identity}} = 5.21, SD = .98$). Participants were divided into quartiles based on this measure: first quartile (Q₁) (n = 12), second quartile (Q₂) (n = 15), third quartile (Q₃) (n = 16), fourth quartile (Q₄) (n = 16). Results of a one-way analysis of variance (ANOVA) with feminine identity quartiles as a factor and the IAT dimensions (visual harmony - attractiveness, visual harmony - gender stereotype, visual harmony - identity, and gender - identity) as dependent variables showed significant differences between the four feminine identity groups in implicit harmony gender stereotype ($F(1, 55) = 6.73, p = .001$), suggesting that for individuals with a high feminine identity visual harmony was stronger associated with femininity than for individuals with a low feminine identity, and in implicit gender identity ($F(1, 55) = 2.36, p = .080$). Here, the (negative) values indicated that individuals with a high feminine identity associated themselves more with females than

individuals with a low feminine identity. There were no significant differences between the four groups in implicit harmony attractiveness evaluation ($F(1, 55) = .77, p = .518$) and implicit harmony identification ($F(1, 55) = .93, p = .432$). Individuals in all four identity groups evaluated harmony more attractive than disharmony (Q₁: $d = .78, t(11) = 5.02, p < .001$; Q₂: $d = .98, t(14) = 9.22, p < .001$; Q₃: $d = .99, t(15) = 10.41, p < .001$; Q₄: $d = .97, t(15) = 13.73, p < .001$) and identified themselves more strongly with harmony than with disharmony (Q₁: $d = .52, t(11) = 5.02, p < .001$; Q₂: $d = .59, t(14) = 5.64, p < .001$; Q₃: $d = .59, t(15) = 4.73, p < .001$; Q₄: $d = .77, t(15) = 7.80, p < .001$) (see Figure 19 for all means).

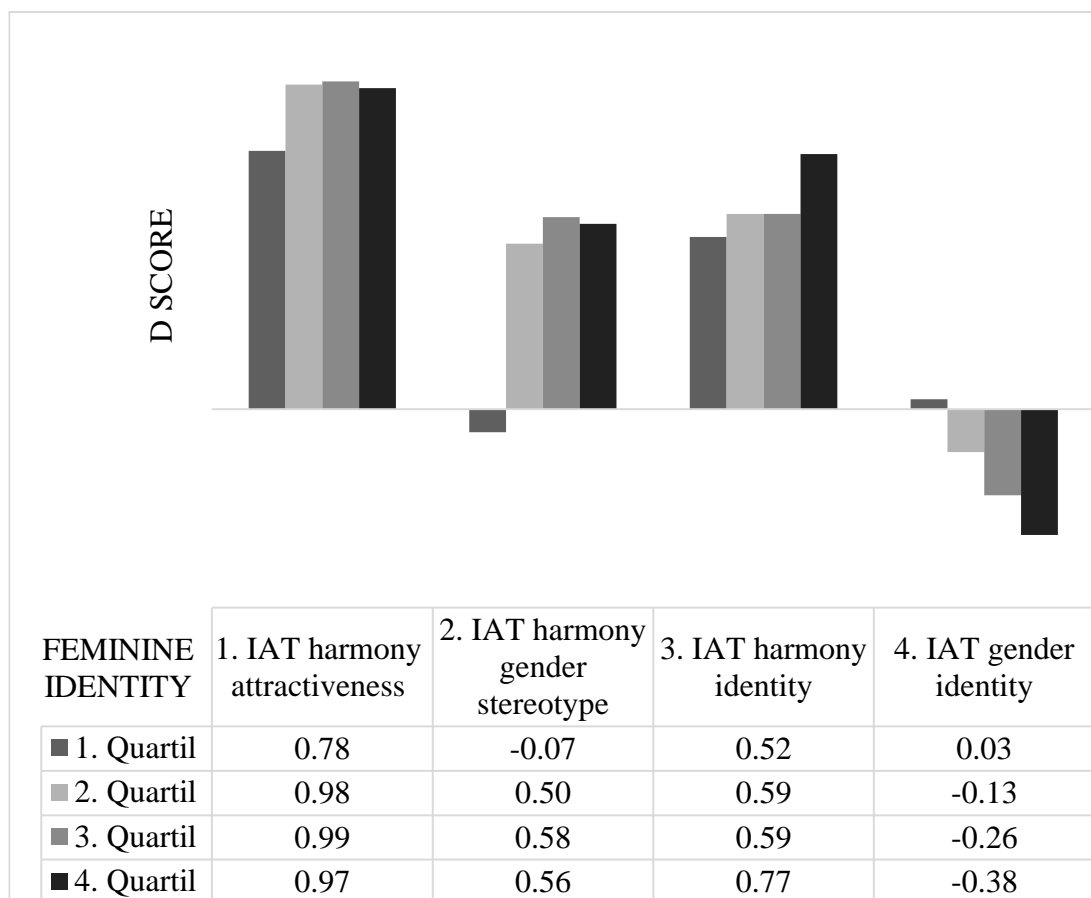


Figure 19: Implicit harmony attractiveness, harmony gender stereotype, harmony identity associations, and gender identity, separated by feminine identity

These findings were consistent with those for males ($n = 30$) and females ($n = 30$) (biological gender). I found differences between males and females in harmony - gender stereotype ($d_{\text{male}} = .15$ vs. $d_{\text{female}} = .69; F(1, 58) = 27.26, p < .001$) and implicit gender identity ($d_{\text{male}} = .08$ vs. $d_{\text{female}} = -.47; F(1, 58) = 41.56, p < .001$), but there were no significant gender differences in implicit attractiveness evaluation ($d_{\text{male}} = .94$ vs. $d_{\text{female}} = .90; F(1, 58) = .12, p = .726$) and harmony identification ($d_{\text{male}} = .69$ vs. $d_{\text{female}} = .54; F(1, 58) = 1.99, p = .164$).

However, females who hold strong harmony + femininity stereotypes ought to like or identify with harmony more than should females who hold weaker harmony + femininity stereotypes. Likewise, males who hold strong harmony + femininity stereotypes ought to like and identify with harmony less than should males who hold weaker harmony + femininity stereotypes. The same should hold true for individuals with a high versus low feminine (masculine) identity (masculine identity: Choi et al. 2009; $\alpha = .85$, $M_{\text{mas identity}} = 4.69$, $SD = .88$). To test this possible interaction effect between harmony - gender stereotype (independent variable) and sex (0 = males, 1 = females) or gender identity (moderators) on implicit harmony attractiveness evaluation and implicit harmony identification (dependent variables), simple moderation analyses were conducted (Hayes, 2013, PROCESS model 1). All continuous variables (with the exception of the outcome) were mean-centered to increase the interpretability of various parameters in models that include interaction terms (Aiken & West, 1991; Hayes, 2013). As can be seen in Table 19, no significant interaction effects emerged ($p > .05$) between visual harmony - gender stereotype and sex or gender identity (both implicit and explicit). The positive effect of harmony - gender stereotype on implicit harmony attractiveness evaluation was consistent with results on correlation analysis. To be more precise, stronger harmony-femininity stereotypes generated stronger harmony-attractiveness associations, independent of respondent sex and gender identity ($b = .41$ [.38], $t = 2.85$ [2.78], $p = .006$ [.008]).

Table 19: Testing for interaction effects between implicit harmony gender stereotype and sex versus gender identity (explicit and implicit)

Dependent variable	Sex and harmony - gender stereotype				Implicit gender identity (GI) and harmony - gender stereotype			
	adj. R ²	b(Sex)	b(Stereotype)	b(Sex x Stereotype)	adj. R ²	b(GI)	b(Stereotype)	b(GI x Stereotype)
Implicit harmony identity	.11	-.40 ^{ns}	.22 ^{ns}	.20 ^{ns}	.07	-.23 ^{ns}	-.06 ^{ns}	-.13 ^{ns}
Implicit harmony attractiveness	.13	-.26 ^{ns}	.41 ^{**}	.25 ^{ns}	.12	.28 ^{ns}	.38 ^{**}	.05 ^{ns}
Dependent variable	Explicit feminine identity (FI) and harmony - gender stereotype				Explicit masculine identity (MI) and harmony - gender stereotype			
	adj. R ²	b(FI)	b(Stereotype)	b(FI x Stereotype)	adj. R ²	b(MI)	b(Stereotype)	b(MI x Stereotype)
Implicit harmony identity	.06	.03 ^{ns}	-.59 ^{ns}	.13 ^{ns}	.05	-.02 ^{ns}	-.32 ^{ns}	-.09 ^{ns}
Implicit harmony attractiveness	.07	.00 ^{ns}	.26 ^{ns}	-.01 ^{ns}	.11	-.04 ^{ns}	.71 ^{ns}	-.11 ^{ns}

Notes: ** p < .01, ns = not significant.

5.5.5 Discussion

As expected and consistent with Study 5 findings, md-IAT results indicate that harmony is automatically associated with attractiveness, femininity, and the self. Furthermore, in line with self-congruity theory, there is a strong correlation between implicit harmony identity and implicit attractiveness as well as implicit gender identity. More precisely, the stronger the implicit association between self and masculine is, the weaker is the implicit identification with harmony.

Interestingly, in contrast to explicitly assessed self-report findings on self-congruity and a design's attractiveness evaluation in Study 5, the IAT reveals no differences between males and females and between individuals with a more feminine identity and individuals with a less feminine identity in implicit harmony evaluation and implicit identification with harmony. However, implicitly measured gender identity seems to correlate with the implicit self-harmony association. An explanation for this unexpected discrepancy could lie with the role of social desirability and social expectations in gendered design responses on the one hand, on the other hand with the awareness of social identity. In contrast to explicit measures, IATs measure unconscious attitudes and beliefs and allow reducing the role of self-reflective, deliberate processes. These results, which show a gap between implicit and explicit associations, lead to the importance of the social context (e.g., private versus public situations) for strengthening the awareness of gender identity as well as for the enactment and interpretation of gendered behavior, for example identified by Patterson and Hogg (2004). Given that visual design is the most outwardly visible valued element of a product that provides social value to the consumer (Kumar & Noble, 2016), and considering that the results for gender-based preference diverge when gender is explicit or implicit (possibly due to lack of awareness), it should be explored whether the social context of consumption plays a role in gendered responses. Building on these results, the first of two aims of Study 7 is to strengthen the awareness of social identity, and thus to address the "not able to report" problem by manipulating the social context. The second aim is explore the role of social expectations in gendered design responses, and thus to address the "not willing to report" problem by manipulating the social context. Therefore, in Study 7 the situation that a product is consumed in (private versus public) is considered along with controlling for effects for social desirability and other contextually relevant constructs.

5.6 Study 7: The Influence of Situational Context

5.6.1 Objective

Study 7 extends previous studies by highlighting the role of social context in gendered responses towards visual design. More precisely, it is hypothesized that gender (sex and identity) differences will be more pronounced when participants are in a public situation as opposed to being in a private situation. For example, when males are in private (e.g., at home), they will evaluate design harmony (strongly associated with femininity) more attractive than in public. In contrast, when males are in a public setting, they feel that they have to perform their socially expected stereotype of masculinity, resulting in a higher preference for visual disharmony (strongly associated with masculinity). To test this prediction, the social context of consumption (private versus public) will be manipulated and, additionally, social desirability and other possible correlates will be included as covariates in Study 7.

5.6.2 Theoretical Background

Most researchers agree that individuals perform their gender (biological and identity) through situated symbolic interactions (Deaux & Major, 1987). In other words, the symbolic interactionist perspective theorizes that individuals construct their gender in social interactions by tailoring their actions to conform (or not) to the normative conceptions of masculinity and femininity that exist in our environment and culture. As designs fulfill important symbolic functions, consumers create and communicate their context-dependent gendered self-concept to relevant others through consumption of products, specifically their design (Gould, 1996). For most consumers, expressing a stereotype-congruent gender image is hereby a key objective. That is why individuals generally prefer possessions which function as symbolic identity markers, and thus reflect their own identity. Previous literature demonstrates that this holds true for both biological gender and social gender identity. For example Martin and Gnoth (2009) showed that more masculine males preferred typically 'male' models, whereas more feminine males preferred more feminine male models, but only in private, as the opinions of others cause them to conform to gender stereotypes in public. According to Fisher and Dubé (2005), male responses to stereotype-congruent (incongruent) advertisements were influenced by the presence of other males in the consumption situation.

As a result, social context should be included as a variable when studying the role of social expectations in gendered design responses. In sum, the moderating effects of sex and gender identity on the harmony-self-congruity-attractiveness relationship seem to depend on the social context such that the conditional effect is stronger (weaker) with females and feminine identities in a public (private) situation and is stronger (weaker) with males and masculine identities in a private (public) situation.

5.6.3 Method

This study employed a 2 (situational context: private vs. public) x 2 (harmony: low vs. high) x 2 (sex: female vs. male) design. Participants were 246 students ($M_{age} = 27.2$ years, $SD = 7.82$, 50% females) from a large German university who participated in an online study and were randomly assigned to study conditions. The study's main purpose was to empirically test for the situational context x harmony x sex (gender identity) interaction effect on self-congruity and attractiveness evaluation. Wine packages were selected as an appropriate category because wine is consumed both publicly and privately and has been successfully used in previous studies involving package design (Orth & Malkewitz, 2008). Similar to the procedure adopted by Orth and Malkewitz (2008), the stimuli included two realistic wine packages, one scoring low and another scoring high on harmony (see Figure 20)



Figure 20: Wine packages high versus low in visual harmony

The experiment started with a situational context manipulation adapted from Zhang et al. (2006). In the private situation, participants were asked to imagine the following:

You want to enjoy a glass of wine alone at home. For that reason, you are buying a wine in a specialty wine store. Keep in mind that your decision will not be evaluated by anyone else.

In the public situation, participants were asked to imagine the following:

You are inviting friends for dinner tonight to enjoy a bottle of wine. For that reason, you are buying a wine in a specialty wine store. Keep in mind that your decision will be evaluated by your guests.

After reading one of the two vignettes, each participant viewed one of two wine packages and submitted scores on attractiveness (Hirschman, 1986; $\alpha = .94$, $M = 3.73$, $SD = 1.55$), masculine appeal (Choi et al., 2009; $\alpha = .71$, $M = 3.31$, $SD = 1.26$), feminine appeal of the stimulus (Choi et al., 2009; $\alpha = .77$, $M = 3.50$, $SD = 1.27$), design elaborateness (Henderson et al., 2003; $\alpha = .65$, $M = 3.46$, $SD = 1.42$), self-congruity (Sirgy et al., 1997; $\alpha = .91$, $M = 3.40$, $SD = 1.51$), design harmony (Kumar & Garg, 2010; $\alpha = .86$, $M = 4.64$, $SD = 1.63$), brand familiarity (Schlosser, 2006; $M = 1.20$, $SD = .69$), and wine preference in general (Mueller et al., 2009; $M = 2.92$, $SD = 1.45$). Next, participants submitted personal information on feminine identity (Choi et al., 2009; $\alpha = .90$, $M = 5.36$, $SD = .92$), masculine identity (Choi et al., 2009; $\alpha = .86$, $M = 4.91$, $SD = .87$), design acumen (Bloch et al., 2003; $\alpha = .86$, $M = 4.40$, $SD = 1.39$), self-deceptive enhancement (Marker & Schneider, 2015; $\alpha = .51$, $M = 4.89$, $SD = .94$), impression management (Marker & Schneider, 2015; $\alpha = .53$, $M = 3.52$, $SD = 1.25$), respondent sex and age. Finally, I included a manipulation check measure for the social context manipulation by asking participants to rate the agreement with the statements “It is mainly for private consumption/It is mainly for public consumption” (reverse coded) and “It is mainly for other people’s attention/It is mainly for self-appreciation” (Zhang et al., 2006). Responses to the two items were averaged, and higher scores indicated that consumption is more public ($\alpha = .60$, $M = 3.38$, $SD = 1.65$).

5.6.4 Results

Manipulation checks

As expected, participants in the public condition ($M = 3.70$, $SD = 1.76$) perceived their decision as more public than participants in the private condition ($M = 3.10$, $SD = 1.76$; $F(1, 238) = 8.13$, $p < .005$).

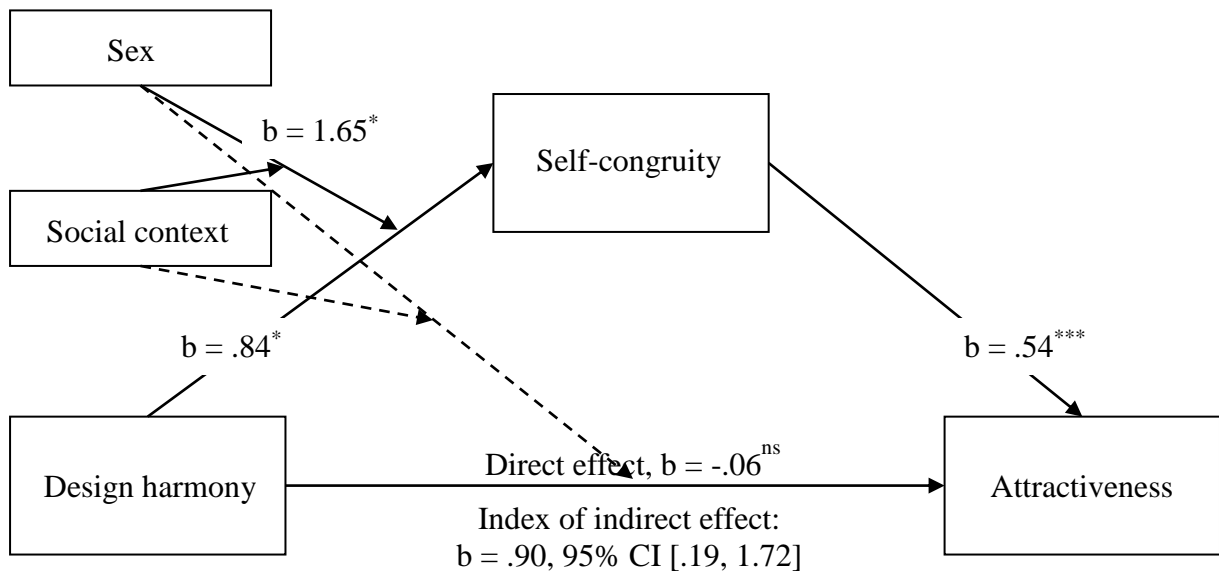
An ANOVA with manipulated harmony as independent variable and perceived harmony as dependent variable revealed a successful manipulation of visual harmony with the high harmony wine package ($M = 5.47$, $SD = 1.26$) being perceived as significantly more harmonious than the wine package low in visual harmony ($M = 3.96$, $SD = 1.59$, $F(1, 242) = 66.11$, $p < .001$).

Moderated moderated mediation analysis of respondent sex and social context

To test the claim that respondent sex interacts with the social context to influence the indirect effect of design harmony on attractiveness evaluation through self-congruity (H12a), I employed moderated moderated mediation analysis (Hayes 2016, PROCESS model 12, number of bootstrap samples = 5000) with harmony as independent variable (0 = low harmony, 1 = high harmony), self-congruity as mediator, attractiveness as dependent variable, and both respondent sex (0 = male, 1 = female) and social situation (0 = private, 1 = public) as moderators. To take into account various boundary conditions and to provide evidence for the robustness of effects, covariates included familiarity with the visual, design elaborateness, perceived design harmony, preference for the type of wine, feminine and masculine appeal of the visual, social desirability (impression management and self-deceptive enhancement), respondent age, design acumen, feminine and masculine identity (see Appendix D for full results).

Results (see Figure 21) showed a significant indirect effect of design harmony on attractiveness evaluation through self-congruity, depending on respondent sex and social context. Bootstrap (5000) results indicated the index of moderated moderated mediation to not include zero ($b = .90$, $SE = .38$, 95% CI [.19, 1.72]). Furthermore, results indicate a significant conditional effect of the respondent sex x design harmony x social context interaction term on self-congruity ($b = 1.65$, $t = 2.47$, $p = .014$). The conditional indirect effect was the strongest for females in a public situation ($b = .56$, $SE = .20$, 95% CI [.21, .98]) and for males in a private situation ($b = .46$, $SE = .19$, 95% CI [.10, .84]). The effect was

nonsignificant for males in a public situation and for females in a private situation. Figure 22 further illustrates this interaction.



Conditional indirect effect at values of sex and situation

Sex	Social Context	Coefficient	95% CI
Male	Private	.46	[.10, .84]
Male	Public	-.13	[-.56, .31]
Female	Private	.25	[-.15, .67]
Female	Public	.56	[.21, .98]

Figure 21: Testing for moderated moderated mediation

Notes: *** $p < .001$, * $p < .05$, ns = not significant. Dashed lines denote a nonsignificant interaction between respondent sex, social context, and design harmony on attractiveness evaluation ($b = .33$, $t = .61$, $p = .543$).

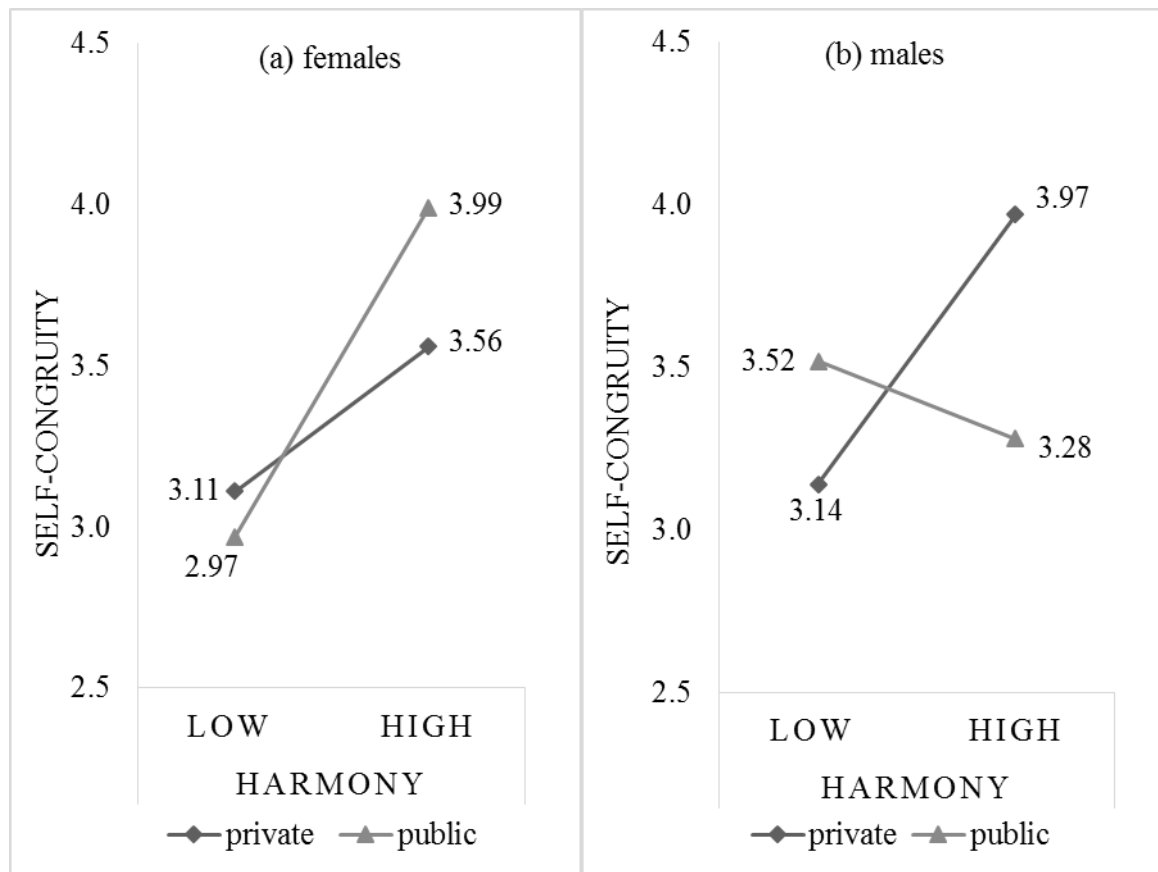


Figure 22: Effect of social context and sex on the design harmony-self-congruity relationship

Moderated moderated mediation analysis of gender identity and social context

To test the claim that the moderated influence of feminine and masculine identity depends on the social context (H12b), I conducted two separate moderated moderated mediation analyses (Hayes 2016, PROCESS model 12), both with design harmony as the independent variable, attractiveness as the dependent variable, self-congruity as mediator, and social context and (feminine and masculine, respectively) gender identity as moderators. Again, covariates included familiarity with the visual, design elaborateness, perceived design harmony, preference for the type of wine, feminine and masculine appeal of the visual, social desirability (impression management and self-deceptive enhancement), design acumen, respondent age and sex. Bootstrap (5000) results for both the feminine identity model and masculine identity model indicated the index of moderated moderated mediation to include zero (feminine identity model: $b = .28$, $SE = .24$, 95% CI [-.17, .77]; masculine identity model: $b = -.10$, $SE = .23$, 95% CI [-.57, .33]). Furthermore, in contrast to sex, the three-way interactions between gender identity, social context, and design harmony on self-congruity

were not significant (feminine identity model: $b = .52$, $t = 1.39$, $p = .166$; masculine identity model: $b = -.19$, $t = -.48$, $p = .630$). Full regression results can be found in Appendix E and F.

Taken together, these findings support Hypothesis 12a and the claim that the moderation of the indirect effect by sex depends on the social context of consumption. Contrasting Hypothesis 12b, the moderation of the indirect effect of design harmony by social gender identity did not differ between public and private situation. Finally, the results indicated that the mediating effect of self-congruity and the combined moderating effect of social context and respondent sex were robust in the presence of other individual difference variables and contextually relevant constructs (e.g., social desirability).

5.6.5 Discussion

The results of this study corroborate the main effect of design harmony on attractiveness as well as the mediating role of self-congruity. As expected, I also find a moderated moderated mediation effect of biological gender and social context in the relationships among design harmony, self-congruity and attractiveness. In other words, whether consumers find design harmony to be congruent with their selves depends on their biological gender and on whether the wine is consumed publicly or privately. More specifically, attractiveness increases with females as the degree of visual harmony increases when the consumption context is in public. Males, in contrast, preferred a higher degree of design harmony in the wine package when consumption occurs in private. Remarkably, this effect was nonsignificant for males in a public situation and for females in a private situation. Another surprising result was the lack of a moderated moderated mediating effect of gender identity and social context in the relationships among harmony, self-congruity, and attractiveness indicating a lower robustness in the findings related to the moderating role of gender identity.

At this point it is important to note that individuals have multiple identities and the situational context can stimulate a certain part of the self-concept to take temporary precedence over the other identities. Regarding the concept of gender identity, Palan (2001) have already attempted to figure out in which context biological sex is important and in which social gender identity. Following Spence (1993), most psychologists view human gender as a multifactorial concept, comprising multiple gender-related factors that may be activated and influence individual behaviors in certain contexts but not in others. In this consumption context, biological gender in contrast to gender identity seems to be more relevant and therefore activated and expressed.

6 General Discussion

This chapter presents a general discussion of the results including a summary of findings (see section 6.1), advancement of theory (see section 6.2), and implications for the management (see section 6.3). Limitations that applied to the current studies and corresponding opportunities for related future research are introduced in the end (see section 6.4).

6.1 Summary of Findings

This thesis presents seven studies conducted in two cultures (USA and Germany), where it is examined how, why, and when gender (biological and gender identity) impacts the effect of a marketing visual's harmony on consumer evaluation of attractiveness across different types of stimuli (logos, typefaces, and products in the first five studies, symbols in Study 6, and wine packages in Study 7) by using multiple methods and a range of explicit and implicit variables.

In particular, Study 1 provides first insights into the composition of the higher-order factor harmony by highlighting that the design principles balance, symmetry, contrast, unity, and variety differentiate harmony categories (low, moderate, and high). Hereby, unity and balance exhibit the strongest relationship with visual harmony, whereas color contrast is not a strong contributor towards design harmony. Furthermore, I predicted and found in both Study 2 and Study 3 that design harmony has a main effect on attractiveness evaluation with females perceiving harmonious design as more attractive than males. Contrasting the hypothesized boredom effect, attractiveness evaluations of both visual disharmony and visual harmony increase over time. The fourth and fifth study extend these findings by demonstrating that self-congruity in contrast to processing fluency mediates the design harmony-attractiveness relationship. The strength of this intermediary process that leads from visual harmony to attractiveness evaluation is influenced by the extent to which an individual identifies him- or herself to be feminine (but not masculine). As such, the results provide strong evidence that individuals who ascribe to feminine personality traits (e.g., nurturing, warm, communal as opposed to agentic) are highly congruent with visual harmony, thus resulting in a higher attractiveness evaluation. In contrast, respondent sex does not impact the intervening mechanism. Furthermore, using measures obtained through an IAT reveals neither feminine

identity nor sex effects, pointing out that systematic differences in explicitly measured preferences for visual harmony could be traced back to social desirability and social expectations (Study 6). Study 7 shows that the consumption situation which involves oneself and others plays an important role here, especially in case of externally visible biological gender. To be more precise, females prefer harmonious designs in social setting, whereas males prefer them in private settings. A summary of all studies can be found in Table 20. Likewise, Figure 23 gives a visual overview on supported and unsupported hypotheses.

The present seven studies extend theory in several ways that are introduced in the following section.

Table 20: Summary of studies 1-7

	Study 1	Study 2	Study 3	Study 4	Study 5	Study 6	Study 7
Focus	Defining visual harmony in product design	Testing sex differences in response to visual harmony	Replication of Study 2 while controlling for personality correlates	Testing the underlying mechanism of processing fluency	Testing the underlying mechanism of self-congruity	Assessing gender differences based on md-IAT	Testing the influence of situational context
Stimuli	Lamps, mobiles, and chairs	Logos, typefaces, and kettles	Logos, typefaces, and kettles	Logos, typefaces, and kettles	Logos, typefaces, and kettles	Words and pictures	Wine packages
Method	Psychological measurement (student sample, n = 81)	Psychological measurement (student sample, n = 78)	Psychological measurement, RET (consumer sample, n = 212)	Psychological measurement (consumer sample, n = 60)	Psychological measurement (student sample, n = 91)	Implicit association test (student sample, n = 60)	Psychological measurement (student sample, n = 246)
Key findings	Visual harmony is correlated to unity (+), balance (+), symmetry (+), and variety (-), whereas it is not significantly correlated to contrast.	Visual harmony has a main effect on attractiveness evaluation (+), moderated by respondent sex.	Replication of Study 2 findings while controlling for design acumen and agreeableness.	Fluency does not mediate the relationship between visual harmony and attractiveness.	Self-congruity mediates the relationship between visual harmony and attractiveness with a feminine identity (but not sex) moderating the indirect effect (+).	Implicit results are not consistent with explicit results.	Respondent sex interacts with situational context to influence the indirect harmony-attractiveness relationship through self-congruity.

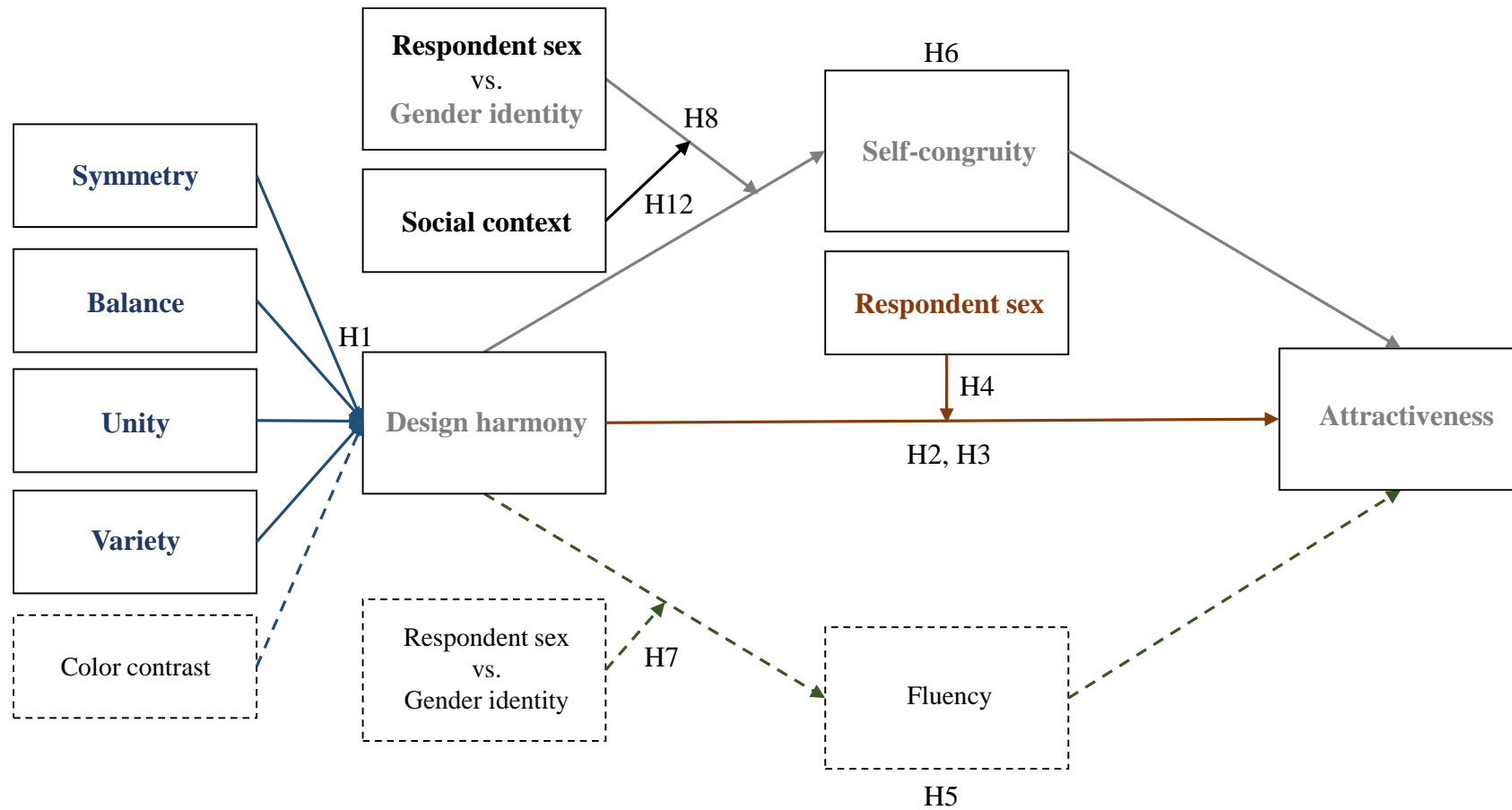


Figure 23: A visual overview on supported and unsupported hypotheses

Notes: Bold lines denote (partially) confirmed hypotheses, dashed lines denote unsupported hypotheses.

6.2 Advancement of Theory

This research makes at least six important theoretical contributions:

First, the present results indicate gender (biological and identity) differences in evaluation of marketing visuals by adopting a holistic perspective. There is a growing body of work documenting sex differences in design preferences (Moss, 2009; Xue & Yen, 2007), but to date, most of the existing studies have investigated specific visual elements of design (e.g., colors and shapes; Moss, 2009). In contrast, the present work focuses on the composition and overall effect of visual harmony as a higher-level factor of design in line with Gestalt theory (Koffka, 1935) and application to marketing communication (Graham, 2008). Due to the fact that human aesthetic appreciation of visual artifacts is a holistic experience (Hekkert, 2006), configural design properties can provide better insights into consumer response than elemental approaches (Kumar & Garg, 2010).

Second, the current finding on the increased impact of both harmony and disharmony on a visual's attractiveness over time makes substantive contributions to the area of consumer response towards (visual) design. For example, Veryzer and Hutchinson (1998) have examined the positive effect of design unity on consumer liking for the product after only one exposure. As in the study by Veryzer and Hutchinson (1998), consumer responses are almost always measured after a single exposure to the proposed design. In the marketplace, however, consumers typically have several opportunities to observe designs of marketing objects before making a final evaluation. By using the RET in Study 3, the present research takes this dynamic processing of attractiveness into account.

Third, this research clarifies the process of how harmony relates to attractiveness. Given that studies addressing congruity effects with visual design characteristics are rare (van Rompay & Pruyn, 2011), the finding that self-congruity mediates the effect of design harmony on aesthetic preferences is important. In line with the branding literature (Aaker, 1996), the results indicate that the aesthetic properties of marketing visuals (such as visually appealing logos, typefaces, products, and package designs) serve as symbols of self-identity during consumption. In this research context, processing fluency is excluded as an alternative intervening mechanism through which the harmony-attractiveness relationship can be explained.

Fourth, this work extends the emerging stream of research that has adopted an interactionist perspective on consumer response to marketing artifacts (Reber et al., 2004).

The finding that females evaluate visuals high in harmony as more attractive than males corroborates that accounting for interaction effects between generic properties of marketing visuals and viewer characteristics increases the explanatory power over stimulus-only or viewer-only approaches. This result supports suggestions that integrating the objectivist with the subjectivist perspective is superior in general (Kumar & Garg, 2010) and in specifics regarding stimulus-viewer interaction effects on attractiveness (Furnham & Walker, 2001).

Fifth, the present dissertation extends prior research by providing strong evidence for social explanations for observed gender differences in aesthetic preferences for visual harmony. To be more precise, the indirect effect of visual harmony on attractiveness evaluation through self-congruity is stronger at high levels of feminine identity compared to low levels of feminine identity. Respondent sex and possible differences in processing abilities between females and males (i.e., processing fluency) do not seem to play a role in this research context. In contrast to biological factors such as chromosomes, hormones, and brain lateralization, within the socialization literature, consumers' perception of themselves, rather than their biological gender per se, is central and considered to be a major factor in the development of gender differences (Putrevu, 2001). Because females are guided more by communal identity than are males (Meyers-Levy & Loken, 2015), they seem to be more congruent with visual harmony and, hence, evaluate harmonious design as more attractive than do males. Moreover, to date, there is no research examining whether an individual's self-attribution of gender as an important component of the self-concept influences the designs she/he prefers. The last point is of particular importance, because gender identity representing a segmentation variable that may be more relevant in today's gender-blurring environments, potentially offers a mechanism for a more refined understanding of the intersection between sex, gender identity, and design preferences. Hence, especially in the case of self-congruity theory, gender identity – more than biological sex – influences the evaluation of design harmony.

Sixth, it is important to note that sex or gender identity effects only occur with explicitly measured dependent variables. While implicit assessments associated harmony with femininity, I found neither sex- nor identity-related differences in the preference for and identification with visual harmony. However, the results diverge in the explicit assessments indicating that social norms (e.g. social desirability, social expectations) play a key role in gendered design responses. In line with this assumption, this thesis find compelling evidence that the indirect effect of visual harmony on attractiveness through self-congruity is

particularly strong for publicly consumed products for females and privately consumed products for males. Therefore, the present work contributes to current knowledge by demonstrating that consumer awareness of others observing and evaluating their design choices has an influence on identification with (and thus liking for) visual harmony. In other words, given that visual design is often the most visible component of commercial offerings, it becomes a means for self-expression and gender performance. These findings involving the effect of social factors (e.g., public versus private situation) and their moderating roles in the relationship between design harmony and aesthetic preference are particularly novel.

6.3 Managerial Implications

In practice, there are two different views on the overall importance of gender ('gender' means here both 'sex' and 'gender identity') in design responses. While some marketers and designers underline the pivotal role of gender needs and desires as influencers of design evaluative outcomes, there is at the same time an increasing trend to create and adopt non-gendered designs, with the aim of not discriminating and of displaying an acceptance of alternative lifestyles in a today's society (Xue & Yen, 2007). In an interview, Andrew Nelkin, the vice president for the optical group at Panasonic, even said "If you try to influence design by gender, you end up missing good design." (Moss, 2009). Likewise, some consumer researchers argue that we are in a post-gender period in which the stark lines that have divided males' and females' preferences and behaviors are blurring (Avery, 2012). Have we finally reached a time when gender does not matter in consumer behavior? Can firms ignore the impact of gender in response to visual design and create their marketing visuals neither masculine nor feminine, but an androgynous mixture of both?

The findings of this work provide an answer to these concerns. Because present studies indicate that gender differences in design preferences exist, the concept of gender, especially the identity-based part, remains an important organizing construct for firms. For practitioners, it is particularly beneficial to know why gender differences occur and when which gender-related factor is activated.

According to the Pew Research Center, 40 percent of the households in the United States with children have females as the primary breadwinner playing the agentic role. Given that females make and influence 80 percent of consumer decisions (Johnson & Learned, 2004) and at the same time more and more males live in single-households making their own consumer decisions, it makes sense for researchers as well as practitioners to further explore gender

differences in design preferences. More precisely, companies should clearly identify their customers and shape the product design around their preferences (Moss, 2009). Hence, this research has important implications for marketers interested in implementing differences in their (product) designs based on gender.

First, the present work shows that translating basic elements into the higher-order factor harmony is critical in helping managers better understand the design of marketing visuals and thus generate positive consumer responses towards them. To be more precise, Study 1 findings enrich the designers' toolkit by offering options how specific design characteristics (e.g., balance and symmetry) can be combined to form levels of harmony. Moreover, the strong main effect of harmony on the aesthetic perception of marketing stimuli remains robust irrespective of design context (i.e., for logos, typefaces, products, and packages) and audience (i.e., consumers and students from USA and Germany). Hence, a practical suggestion for managers is to make sure that the design of their offers show a certain level of harmony in order to attract consumers. With the help of (in-house) market research, a harmony test on products or packages could be easily conducted by using online survey platforms. Brand managers and design practitioners may be able to use this knowledge to stimulate consumer 'liking' of their product via the use of appropriately developed visuals that are not even specifically product related (such as packaging) such as logos and typefaces. Then, going further, re-enforce an optimum visual presentation by extending the strategy to the product 'surrounds' and even the product itself. In other words, given that the attractiveness evaluation of visual harmony is generalizable across stimuli, it helps corporations to manage their entire design portfolio, including signage, brand logos, and websites. In sum, both designers and companies can use these results to create appropriate designs and aesthetic impressions which should, based on other research (e.g., Creusen & Schoormans, 2005; Orth & Wirtz, 2014), impact approach behaviors and choice.

Second, Study 3 findings indicate that both visual harmony and visual disharmony are evaluated more attractive after repeated evaluations, suggesting that design preferences improve with repetition. This repeated evaluation effect may also offer practical implications. If marketing managers decide not to revolutionize the design of their marketing visuals to make them more harmonious, they might induce a moderate level of exposure to their logos, typefaces, products, and packages in order to increase consumers' evaluation of attractiveness. Online advertisers, for example, could increase exposure frequencies by presenting their designs in banner or pop-up ads.

Third, more fundamental practical implications lie with my finding that respondent sex moderates the effect of harmony on attractiveness with females evaluating visual harmony as more attractive than males. Given the potential of this variable for segmentation purposes, marketers could employ the present findings to optimize the design of products, packages, logos, and typefaces and tailor their visuals' overall level of harmony to target audiences in order to make offers more appealing and to realize more effective promotional strategies. The findings of this research can also be employed to orient new marketing visuals accordingly in order to maximize their likely attractiveness to those consumers.

Fourth, Study 5 shows that there is a 'like attracts like' direction, called a self-congruity tendency, suggesting that individuals with specific personality traits favor design with similar personality to their own. The findings of this research have implications for marketers seeking to create a match between their visuals and their target audience. In line with observed intervening mechanism of self-congruity, marketing professionals should make sure that the design of products and packages as well as subtle cues such as logos and typefaces appeal to consumers' social self.

Fifth and more fundamentally, because a feminine identity (and neither masculine identity nor respondent sex) moderates the indirect effect of visual harmony on attractiveness through self-congruity, I have shown that a feminine identity can have more influence and be of greater explanatory value than sex in understanding consumers' evaluation of design in this research context. Practitioners may find the insights provided useful not only for creating designs that appeal to a specific biological gender but perhaps more so for creating designs that appeal to individuals with specific (feminine) personality traits. Owing to the fact that marketing visuals function as symbolic gender identity markers, consumers generally prefer design that reflect their feminine identity. Hence, marketing managers and designers can significantly improve the effectiveness of their visual design by matching marketing visuals to the gendered self-image of their target audience. It may require only minor modifications in the physical characteristics of the goods rather than expensive changes in the production process. It can often be done almost entirely by manipulating subtle cues of packages and products (e.g., for individuals with a greater feminine identity: low-contrast colors, rounded shapes, etc.). In sum, these results could be interpreted to suggest that marketers should be less interested in the male-female dichotomy and more interested in the level of masculinity or femininity. Initial marketing activities of firms demonstrate that an individual's gender identity represents a segmentation variable that may be more relevant in today's gender-

blurring environments than merely focusing on consumer's biological gender (e.g., catalog of the Scandinavian toy retailer Top-Toy, a licensee of the Toys 'R' Us brand, showing boys and girls playing with both typical female toys and typical male toys). But it is important to survey customers' gender identity at regular intervals due to structural changes of an individual's gender identity across the life cycle (Ashmore & Del Boca, 1986)

Sixth, since the moderating effect of gender (especially biological gender) on the indirect effect of visual harmony on attractiveness through self-congruity varies across the situational context of consumption (public versus private), consumer's gender can be viewed as a multifactorial construct, comprising various gender-related factors that may be activated and influence consumer preferences and behavior in certain situations but not in others. In other words, because individuals construct their gender in social interactions by tailoring their actions to conform (or not) to the normative conceptions of gender that exist in our environment and culture, marketers and designers must bear in mind that social norms play a crucial role in gendered behavior. Marketing professionals could also make use of these findings by making gender more or less salient (e.g., by creating a public or private situation) in order to reinforce gender typical (or atypical) behavior. Moreover, given that males find visual harmony more attractive in private than in public situations, marketers may wish to design more harmonious looking products for use in private settings. This conclusion supports earlier suggestions that males may have more insecurities about publicly using products which could be considered typically feminine (Kirkham & Attfield, 1996). This finding should be particularly advantageous for firms when creating a more harmonious appearance (compared to creating less harmonious designs with multiple design elements) goes along with cost savings in product development or manufacturing.

Taken together, my studies provide corroboration for the limited work that has preceded it, but importantly, extends it and provides additional insights due to the number of distinct contexts, multiple methods, and divergent consumer respondent groups tested.

6.4 Research Limitations and Future Research

While I believe that the present findings offer several valuable insights to researchers and practitioners, a few limitations and possible avenues for future research need mentioning.

First, study results show that individuals who ascribe to a feminine identity feel more congruent with visual harmony. Admittedly, it is problematic to trace sex differences in attractiveness evaluation solely back to gender identity effects because across time, gender

roles have changed, particularly for females. While females have entered male-dominated professions and have taken on agentic personality traits like assertiveness, lack of acceptance of most feminine attributes in males remained fixed (Meyers-Levy & Loken, 2015). Consistent with these findings, the dynamic stereotype results found by Rudman and Phelan (2010) suggest that people expect females to make further inroads into masculine domains, whereas they do not expect males to become occupiers of feminine roles. As a result, females are envisioned to be both agentic, high-earning breadwinners and communal, primary caregivers, whereas males' roles and stereotypes are not expected to change. The present studies show results along this trend. Females are found to score higher on the feminine factor, whereas no differences are found between males and females on the masculine factor (see Study 5 findings). Therefore, the significant moderating effect of feminine identity still seems to represent sex differences, whereas there is no longer a sex difference on the measure of stereotypically masculine personality traits. In general, although I found broad support to the moderating effect of gender (biological and identity), with regards to the question of whether gender identity or biological gender is a better predictor for the preference of design harmony, I found mixed results. For example, contrary to expectations, gender identity (as opposed to sex) does not interact with social context to influence the indirect effect of harmony on attractiveness through self-congruity. One explanation could be that, according to Spence (1993), the BSRI instrument should only be used in particular situations where personality traits are relevant. Furthermore, with regard to social interactions, the focus of future research should be on the role of sex stereotypes, sex-role attitudes, and the quality of relationships in social contexts. Sex stereotypes are structured sets of beliefs about the categories female and male, and sex-role attitudes refer to an individual's level of agreement with traditional views on sex stereotypes (Ashmore & Del Boca, 1986). Both constructs may have an impact on the evaluations of the sexes and thus their behavior in social contexts. An alternative reason for this mixed result could be cultural factors. Study samples were from western United States and Germany with different expectations of gender roles. Future research should explore the combined role of culture and gender expectations in their influence on the perceived attractiveness of design harmony. A particularly fruitful area would be to explore gender differences in preference for visual harmony in highly masculine and highly feminine cultures. These cultures are likely to exhibit the gender as a performance phenomenon I alluded to earlier than in other cultures. In addition, anthropologists have shown that the masculinity/femininity varies from one culture to the next. For instance,

perceptions of femininity in terms of clothing are different in the West and in Muslim countries (Ulrich & Tissier-Desbordes, 2013). Taken together, since these mixed results for gender identity and biological sex are indicated, more research and further insights are needed to understand when and why these two concepts yield different findings in some contexts but not in others.

Second, it seems very likely that the pretested stimuli which were partly taken from prior research on harmony (logos: Henderson & Cote, 1998; typefaces: Henderson et al., 2004; packages: Orth & Malkewitz, 2008) differ in other dimensions that correlate with visual harmony. In line with Study 1 findings and the definition of harmony as a higher-order design factor (Henderson & Cote, 1998), other design characteristics such as roundness, symmetry, and balance are facets contributing more or less to the overall harmony effect. This is why designs high versus low in visual harmony differ in these design characteristics. Although, I have already controlled for other design dimensions such as design elaborateness and other possible correlates in order to rule out alternative explanations and to better isolate the impact of visual harmony (and gender), there are still other factors on which these visuals differ (e.g., naturalness, modernity). In addition, harmony is a prominent but only one of several higher-level generic factors of design. While the harmony factor arguably is most closely related to the self, other factors such as naturalness or elaborateness (Henderson & Cote, 1998) may appeal to different facets of the self (Limon et al., 2009) and may thus contribute to explaining differences in viewer response across audiences varying in personality traits and self-concept.

Third, since the present research has focused on aesthetic impression (i.e., judgment of attractiveness) as dependent variable, an interesting extension would be to shed some light on recognition or consumer recall, behavioral intent (e.g., consumer purchase, choice behavior), and actual behavior, for example, by using scanner panel data. In the case of recognition, future research should examine whether visuals high in harmony or visual low in harmony may be easier to recognize. Recognition involves consumers remembering having seen the marketing object before and offers many benefits for companies. In fact, a recognizable product would be more easily found and, ultimately, purchased (Henderson et al., 2003).

Finally, this research used logos, typefaces, products, and packages as the marketing artifacts context. For the purposes of improving the robustness and generalizability of these results, future research should explore the validity of the hypotheses in this research to other design contexts. For example, additional work might also look into whether these hypotheses

hold in other sensory contexts (music, tastes, and smell) given the increasing focus on sensory experiences marketing and consumer research is turning towards (Krishna, 2013).

Taken together, given the importance of gender differences in consumer behavior and their downstream implications for companies, more systematic theory-based research is needed to establish the nature of these relationships. In an era where traditional gender roles are being challenged and gender identities are becoming more and more nuanced, I hope that this research helps to provide a more nuanced understanding of the aesthetic preferences of males and females alike.

7 Summary

Gender Differences in Response to Visual Harmony: Disentangling Biological and Social Factors

Conceptualizing consumer reactions to visual design, Bloch (1995, 2011) posits that designers create visual appearance by combining basic elements of design such as shapes and colors, with the aim of forming a unified aesthetic whole. One important generic factor of design and, additionally, a major driver of consumer evaluation of a design's attractiveness is visual harmony, which can be defined as a congruent pattern that combines symmetry and balance (Henderson & Cote, 1998). Conceptually, the reasons for a positive evaluative outcome of visual harmony are not fully understood (Hekkert & Leder, 2008). However, recent research suggests that the influence of visual harmony on a stimulus' attractiveness may not be as universal as previously thought, with a few influencers possibly moderating the relationship. Biological gender or sex (used interchangeably here) is thought to be a key discriminator in consumer response to visual design in that males and females find different types of aesthetic appeals attractive (Crilly et al., 2004; Moss, 2009). In practice, sex has been and continues to be one of the most commonly employed basis for segmenting markets (Wolin, 2003) with marketers and advertisers spending millions on designing commercial offers which visually appeal to male or female consumers (e.g., Coca Cola) (Meyers-Levy & Loken, 2015). Moreover, in an era where traditional gender identities (as opposed to sex) are becoming more fluid with females being stronger and more dominant and males being more sensitive and caring (Fugate & Phillips, 2010), for researchers and practitioners, it is important to understand if design preferences are sex-related or gender identity-related. In addition, only a few studies have explored the underlying reasons and mechanisms through which such differences in design occur. To address these gaps, the present thesis sheds light on the role that gender (biological versus identity) plays in the harmony-attractiveness relationship. Moreover, this work tests processing fluency and self-congruity as possible explanatory mechanisms and the moderating effects of biological gender versus gender identity on the indirect influence of visual harmony on attractiveness through processing fluency and self-congruity, respectively. As an ancillary but novel question this dissertation also explores if the nature of sex and gender identity-related effects hold true when employing an implicit measure (i.e., IAT) and when varying the consumption context (i.e., public versus private situation).

In sum, to examine how, why, and when gender (biological versus gender identity) impacts the effect of a marketing visual's harmony on consumers' evaluation of attractiveness, this thesis presents seven studies conducted in two cultures (USA and Germany) in which the effects are tested across different types of stimuli (logos, typefaces, and products in the first five studies, symbols in Study 6, and wine packages in Study 7) by employing multiple methods and a range of explicit and implicit variables. A summary of these studies is given in the following:

The aim of *Study 1* was to provide first insights into the composition of the higher-order factor harmony. Ninety students participated in the study where harmony was manipulated and balance, symmetry, contrast, unity, and variety were measured. Lamps, mobiles, and chairs were selected as appropriate stimuli due to the key role of their visual design as a purchase criterion and the large variance in design. Analyses were conducted at the stimulus level. ANOVA findings highlighted that the design principles balance, symmetry, contrast, unity, and variety differentiated harmony categories (low, moderate, and high) such as products high in visual harmony were perceived to be more balanced, symmetric, and unified than products low in visual harmony, and also that harmonious products were judged to have less contrast and be less complex than disharmonious products. Furthermore, consistent with correlation results, the design characteristics unity and balance exhibited the strongest relationship with visual harmony, whereas color contrast was not a strong contributor towards design harmony. Therefore, the present work has taken the first step to better understand visual harmony by tracing it back to more basic and, more importantly, measurable design elements which is critical in helping firms better design their products and packages. Additionally, Study 1 showed first signs for a positive harmony-attractiveness relationship.

Building on Study 1 findings, Study 2 and Study 3 aimed at testing the positive main effect of visual harmony on attractiveness and the moderating role of respondent sex in the harmony-attractiveness relationship. Additionally, Study 3 focused on the dynamic effect of attractiveness evaluation by integrating frequent presentations of the visuals.

Therefore, in *Study 2*, seventy-eight students responded to three randomly selected and pretested visuals (one typeface, one logo, and one kettle) by submitting information on stimulus attractiveness, harmony, and their sex. Typefaces, logos, and kettles high versus low in design harmony were selected based on their use in past research and to enhance the generalizability of findings. An additional criterion was that they should appeal uniformly to both sexes. Results of a three-way mixed design ANOVA indicated that design harmony had

a significant main effect on attractiveness evaluation. Furthermore, the two-way interaction between sex and harmony was significant. Post-hoc contrasts showed that females preferred harmonious designs more than males. These findings provide initial evidence that viewer's sex interacts with a design's harmony to influence individual evaluation of the design's attractiveness.

Study 3 was designed to test (a) the dynamic effect of harmony's attractiveness evaluation and (b) if the moderating effect of respondent sex on the relationship between harmony and perceived attractiveness was robust when effects of CVPA and agreeableness were accounted for. Two hundred and twelve consumers viewed images, one by one, in a random order, of the six stimuli (two typefaces, two logos, and two kettles), submitting an initial rating of attractiveness. After an extended evaluation phase (RET), participants submitted a second rating of attractiveness. Results of repeated measures ANCOVA supported the hypothesized main effect of harmony on attractiveness evaluation with females perceiving harmonious design as more attractive than males. Contrary to the hypothesized boredom effect, attractiveness evaluations of both visual disharmony and visual harmony increased over time.

Study 4 and *Study 5* build on the obtained results from previous *Studies 2* and *3* by investigating possible underlying mechanisms which could clarify the harmony-attractiveness relationship. Furthermore, both studies aimed at exploring the moderating role of respondent sex as opposed to gender identity.

More precisely, *Study 4* tested processing fluency as a possible mediator of the relationship between visual harmony and attractiveness with respondent sex as opposed to gender identity moderating this effect. Sixty participants viewed three of six randomly assigned stimuli (one typeface, one logo, one kettle). Subsequently, they submitted scores on attractiveness, fluency, visual harmony, their design acumen, loneliness, gender identity, and sex. Contrary to expectations, results of a simple mediation analysis indicated a nonsignificant indirect effect of design harmony on attractiveness evaluation through fluency. Moreover, respondent sex did not work as a moderator in the moderated mediation model.

To better understand the workings of design harmony from a more social-oriented perspective, *Study 5* focused on self-congruity as an alternative underlying mechanism and explored the role of social gender identity (in the form of feminine and masculine personality traits). An online survey presented ninety-one U.S. students with three of six randomly assigned stimuli (one typeface, one logo, one kettle) before they submitted ratings on attractiveness, visual harmony, masculine and feminine appeal of the stimulus to provide a

measure of self-congruity, their gender identity and sex. As hypothesized, results of moderated mediation analysis with self-congruity as a mediator and gender identity as a moderator demonstrated that self-congruity (in contrast to processing fluency) mediated the design harmony-attractiveness relationship. The strength of this intermediary process that led from visual harmony to attractiveness evaluation was influenced by the extent to which an individual identified him- or herself to be feminine, such that the indirect effect was stronger at high levels of feminine identity. In contrast, respondent sex did not impact the intervening mechanism. To date, there is no research examining whether a person's self-attribution of gender influences the design he/she prefers.

To shed light on the role of social expectations in gendered responses towards visuals, *Study 6* extended previous studies by investigating implicit associations with visual harmony and by exploring gender identity- and sex-based differences in these implicit harmony constructs. Because research on explicit measures is based on the assumption that people are aware of their identity (e.g., gender identity) and willing to share their opinion with others, past research nominated the implicit association test (IAT) as a powerful procedure for assessing unconscious and automated thoughts, attitudes, and personality traits (Greenwald et al., 1998), hence avoiding the limitations associated with explicit measures used in previous studies. Consequently, sixty participants completed four IATs and a psychometric questionnaire. INQUISIT Lab by milli-second was used to present the stimuli and to collect data. In its entirety, the procedure closely followed the multidimensional (md) IAT successfully employed by Gattol et al. (2011). As expected, md-IAT results based on IAT effects (the so called *D* score, introduced by Greenwald et al. [2003]) indicated that harmony was automatically associated with attractiveness, femininity, and the self. In line with self-congruity theory, correlation analysis on *D* values revealed that attractiveness was significantly related to harmony identity. In addition, gender identity was significantly correlated with harmony identity. In contrast to explicitly assessed self-report findings, results of one-way ANOVAs revealed neither feminine identity nor sex effects on implicit attractiveness evaluation and implicit harmony identity, pointing out that systematic differences in explicitly measured preferences for visual harmony or disharmony could be traced back to social desirability and social expectations.

Building on these results, *Study 7* aimed at exploring the role of social expectations in gendered design responses by manipulating the social context. Therefore, in *Study 7* the consumption situation (public versus public) was considered along with controlling for effects

of social desirability and other contextually relevant constructs. Participants were two hundred and forty-six students who participated in this computer-based study. Different than in previous studies, wine packages were selected as an appropriate category because wine is consumed both publicly and privately and has been successfully used in previous studies involving package design. After reading one of the two vignettes (situational context manipulation adapted from Zhang et al. [2006]), participants viewed one of two wine packages and submitted ratings on attractiveness, harmony, and various control variables as well as personal information such as their gender identity and sex. Results of moderated moderated mediation analysis confirmed the main effect of design harmony on attractiveness as well as the mediating role of self-congruity. As expected, findings indicated a moderated moderated mediation effect of biological gender and social context in the relationships among design harmony, self-congruity, and attractiveness. To be more precise, females preferred harmonious designs in social setting, whereas males preferred them in private settings. Consequently, the consumption situation which involves oneself and others is an important boundary condition for gender differences in aesthetic preferences.

In sum, the present seven studies extend theory in several ways and have important implications for marketers interested in implementing differences in their (product) designs based on gender. For example, managers and designers can significantly improve the effectiveness of their visual design by matching the visual to the self-image of target audiences. Thus, practitioners may find the insights provided useful not only for creating designs that appeal to a specific biological gender but perhaps more so for creating designs that appeal to individuals with specific (feminine) personality traits. Taken together, in an era where traditional gender roles are being challenged and gender identities are becoming more nuanced, this research provides a first step towards a more nuanced understanding of the aesthetic preferences of males and females.

8 Zusammenfassung

Geschlechterunterschiede in der Reaktion auf visuelle Harmonie: Die Rolle von biologischen und sozialen Faktoren

Nach dem Ansatz von Bloch (1995, 2011) und den Prinzipien der Gestaltpsychologie (Koffka, 1935) kombinieren Designer bei der Gestaltung von Produkten und Verpackungen eine Vielzahl an Designelementen, wie Formen und Farben, um ein ästhetisches „Ganzes“ zu kreieren. Entscheidende Faktoren, die einen positiven Einfluss auf die Attraktivitätsbewertung ausüben, sind insbesondere holistische Designfaktoren (Orth et al., 2010). Definiert als Designfaktor, welcher Symmetrie und Balance miteinander vereint, nimmt die visuelle Harmonie hier eine Schlüsselrolle ein (Henderson & Cote, 1998). Der positive Effekt visueller Harmonie scheint jedoch nicht universell zu sein, sondern ist von individuellen Unterschieden geprägt. Es wird vermutet, dass von diesen Faktoren das Geschlecht die stärkste moderierende Wirkung auf designbasierte Präferenzen ausübt (Crilly et al., 2004; Moss, 2009). Tatsächlich ist das Merkmal des biologischen Geschlechts ein häufig verwendetes Marktsegmentierungskriterium (Wolin, 2003). Das zeigt sich unter anderem dadurch, dass Unternehmen, wie Coca-Cola, jährlich Millionen dafür ausgeben, Frauen und Männer mit unterschiedlichem Verpackungsdesign anzusprechen (Meyers-Levy & Loken, 2015). Ob sich dieser Ansatz lohnt, untersucht die vorliegende Arbeit. Bisher herrschte vor allem Unklarheit darüber, ob und wie das Geschlecht – als biologisches oder soziales Konzept – die ästhetische Beurteilung von harmonischem Design beeinflusst. Darüber hinaus testet die Dissertation das Konzept der Verarbeitungsfluenz sowie der Kongruenz zwischen Stimulus und Selbstbild als mögliche zugrundeliegende Erklärungsprozesse für beobachtete Unterschiede. Da geschlechtsbedingtes Antwortverhalten mit sozialer Erwartung verbunden ist, wurden die Ergebnisse außerdem mit einem impliziten Assoziationstest (IAT) sowie in Abhängigkeit des sozialen Kontexts (öffentlich versus privat) überprüft.

Um zu untersuchen, wie, warum und wann das Geschlecht (biologisch oder identitätsbasierend) einen Einfluss auf die Beziehung zwischen visueller Harmonie und dem Attraktivitätsurteil ausübt, wurden in dieser Arbeit insgesamt sieben Studien in zwei Ländern (USA und Deutschland) durchgeführt. Die angenommenen Effekte wurden über verschiedene Stimuli (Logos, Schrifttypen und Produkte in den ersten fünf Studien, Symbole in der sechsten Studie, und Verpackungen in der siebten Studie) und durch den Einsatz vielfältiger Methoden getestet. Es folgt eine kurze Zusammenfassung der Studien.

Das Ziel der *ersten Studie* war es, einen ersten Einblick in die Zusammensetzung des holistischen Designfaktors Harmonie zu erhalten. 90 Studenten haben an dieser Studie, in der die Variable Harmonie manipuliert und die Designcharakteristiken Balance, Symmetrie, Kontrast, Einheitlichkeit und Komplexität gemessen wurden, teilgenommen. Lampen, Mobiltelefone, und Stühle wurden aufgrund der wichtigen Rolle des Designs als Entscheidungskriterium beim Kauf und der Designvielfalt als Stimuli ausgewählt. Die Analyseergebnisse zeigten, dass harmonische Stimuli balancierter, symmetrischer, und einheitlicher als unharmonische Stimuli bewertet wurden. Außerdem wiesen sie geringere Mittelwerte hinsichtlich des Farbkontrastes und der Komplexität auf. Zudem zeigten Korrelationsanalysen, dass die Designcharakteristiken Einheitlichkeit und Balance die stärkste Beziehung mit visueller Harmonie aufwiesen, während die Korrelation zwischen Harmonie und Kontrast nicht signifikant war. Folglich hat diese Studie den ersten Schritt gemacht, die Struktur des holistischen Designfaktor Harmonie zu verstehen und auf messbare Elemente herunterzubrechen. Diese Ergebnisse liefern wichtiges Handwerkszeug für Unternehmen und insbesondere Designer, um ihre Produkte und Verpackungen harmonischer und damit attraktiver zu gestalten.

Studie 2 und 3 bauten auf den Ergebnissen der ersten Studie auf und zielten darauf ab, den Einfluss visueller Harmonie auf das Attraktivitätsurteil sowie den moderierenden Effekt des biologischen Geschlechts auf diese Beziehung zu testen. Des Weiteren fokussierte die dritte Studie den dynamischen Prozess der Attraktivitätswahrnehmung durch wiederholte Darbietung der Stimuli.

Um diese Ziele zu erreichen, gaben in *Studie 2* 78 Studenten ihre Bewertungen hinsichtlich der Attraktivität und Harmonie zu drei zufällig ausgewählten und auf Harmonie vorgetesteten Stimuli ab. Außerdem machten sie Angaben zu ihrem biologischen Geschlecht. Schrifttypen, Logos und Wasserkocher, die sich in ihrer visuellen Harmonie unterschieden (hoch versus niedrig), wurden auf Basis früherer Forschung und zur Generalisierbarkeit der Ergebnisse ausgewählt. Ein weiteres Kriterium war, dass die Stimuli generell beide Geschlechter gleichermaßen ansprechen. Die Ergebnisse dieser Studie zeigten, dass Harmonie einen direkten und positiven Einfluss auf die Beurteilung der Attraktivität des Designs ausübte. Darüber hinaus konnte eine signifikante Interaktion zwischen dem biologischen Geschlecht und der visuellen Harmonie bestätigt werden. Demnach empfanden Frauen harmonisches Design attraktiver als Männer, während Männer unharmonisches Design ästhetischer wahrnahmen als Frauen.

Studie 3 hatte folgende Ziele: 1. Testen des dynamischen Effektes der Attraktivitätsbewertung von harmonischen Designs und 2. Untersuchung des moderierenden Effektes des biologischen Geschlechts unter Hinzunahme weiterer möglicher Einflussfaktoren (CVPA und Verträglichkeit) als Kontrollvariablen. 212 Konsumenten sahen und bewerteten alle sechs Stimuli (2 Schrifttypen, 2 Logos und 2 Wasserkocher in zufälliger Reihenfolge) nach ihrer Attraktivität. Daraufhin folgte eine ausführliche Evaluierungsphase, in der die Probanden wiederholt die Stimuli anhand 25 verschiedener Attribute (z.B. kitschig) bewerteten. Nach dieser Phase folgte eine erneute Beurteilung der Attraktivität. Die Ergebnisse bestätigten den positiven Haupteffekt visueller Harmonie auf das ästhetische Urteil und den moderierenden Effekt des biologischen Geschlechts. Entgegen der Annahmen wurden sowohl die harmonischen als auch die unharmonischen Stimuli über den Zeitverlauf attraktiver wahrgenommen.

Studie 4 und *5* nutzten die Ergebnisse der beiden letzten Studien mit dem Ziel, zugrundeliegende Mechanismen zu überprüfen, die die Harmonie-Attraktivitäts-Beziehung erklären könnten. Überdies untersuchten beide Studien die moderierende Rolle des biologischen Geschlechts im Vergleich zur sozialen Geschlechtsidentität.

Um genauer zu sein, testete *Studie 4* die Flüssigkeit (Fluenz) der Verarbeitung als möglichen Mediator der Beziehung zwischen visueller Harmonie und Attraktivität. Das biologische Geschlecht diente hierbei als Moderator. 60 Teilnehmer betrachteten drei zufällig gewählte Stimuli (einen Schrifttypen, ein Logo und einen Wasserkocher). Anschließend machten sie Angaben zur Attraktivität, Verarbeitungsfluenz, visuellen Harmonie sowie zu ihrem Designspürsinn (ein Teil der CVPA Skala), ihrer Einsamkeit, ihrer Geschlechtsidentität und dem biologischen Geschlecht. Entgegen der Erwartungen zeigten die Ergebnisse der Mediationsanalyse keinen signifikanten indirekten Effekt der visuellen Harmonie auf die Attraktivität über die Verarbeitungsfluenz. Auch das biologische Geschlecht übte hier keinen moderierenden Effekt aus.

Um die Prozesse visueller Harmonie von einer sozial orientierten Perspektive zu beleuchten, lag der Fokus der *fünften Studie* auf der Kongruenz (zwischen dem Selbstbild und Eigenschaften des Stimulus) als möglicher alternativer Erklärungsmechanismus sowie auf der Rolle der sozialen Geschlechtsidentität (in Form von feminine und maskulinen Persönlichkeitseigenschaften). 91 Studenten aus den USA betrachteten drei zufällig zugeordnete Bilder (einen Schrifttypen, ein Logo und einen Wasserkocher), bevor sie Angaben zu der Attraktivität, der visuellen Harmonie, den maskulinen und femininen

Eigenschaften des Stimulus (dient der Messung der Kongruenz), ihrer Geschlechtsidentität und ihrem Geschlecht machten. Wie vermutet, zeigten die Ergebnisse der moderierten Mediation, dass visuelle Harmonie indirekt über die Selbstkongruenz einen Einfluss darauf hatte, wie attraktiv der Stimulus beurteilt wurde. Hinzu kommt, dass das biologische Geschlecht keine moderierende Rolle spielte, die soziale Geschlechtsidentität in Form von Persönlichkeitseigenschaften hingegen schon. Genauer gesagt, war der indirekte Effekt bei Menschen mit einer femininen Identität stärker ausgeprägt. Damit liefert diese Arbeit einen ersten Erklärungsansatz für individuelle Unterschiede in der Beurteilung von visueller Harmonie.

Um die Rolle der sozialen Erwartungen im geschlechtsbedingten Antwortverhalten in Bezug auf visuelles Design besser zu beleuchten, untersuchte *Studie 6* implizite Assoziationen mit visueller Harmonie und geschlechtsbasierte (biologisch und sozial) Unterschiede in diesen impliziten Konstrukten. Während Forschung, die sich lediglich mit expliziten psychometrischen Messmethoden beschäftigt, davon ausgeht, dass die Probanden sich ihrer Einstellungen und Ansichten bewusst sind und diese auch mit dem Forscher teilen möchten, misst der implizite Assoziationstest (IAT) automatische (unbewusste) Assoziationen und Konzepte. Im Rahmen der Laborstudie beendeten 60 Teilnehmer vier einzelne IATs und füllten einen Fragebogen aus. Die Prozedur war dabei an den Ablauf des multidimensionalen (md) IAT angelehnt, welcher erfolgreich von Gattol et al. (2011) eingeführt wurde. In Übereinstimmung mit den Annahmen zeigten die Ergebnisse, dass Harmonie automatisch mit Attraktivität, Weiblichkeit, und dem Selbst assoziiert wurde. Im Einklang mit der Kongruenz-Literatur ließen die Ergebnisse der Korrelationsanalysen erkennen, dass eine implizite Attraktivitätsbeurteilung von Harmonie positiv mit der impliziten Identifizierung mit Harmonie zusammenhing. Außerdem war die Korrelation zwischen impliziter Geschlechtsidentität und impliziter Identität mit visueller Harmonie signifikant. Betrachtete man hingegen Unterschiede zwischen Männern und Frauen sowie zwischen Individuen mit einer mehr oder weniger ausgeprägten femininen Identität, wichen diese Gruppen im Hinblick auf ihre automatische Attraktivitätsbeurteilung von und Identifizierung mit Harmonie nicht signifikant voneinander ab. Diese Ergebnisse standen im Gegensatz zu den vorherigen Studien, welche möglicherweise auf soziale Erwartungen und sozial erwünschtes Verhalten zurückzuführen waren.

Auf dieser Studie aufbauend, untersuchte *Studie 7* die Rolle der sozialen Erwartungen in geschlechtsbezogenen Reaktionen auf visuelles Design, welches eine starke symbolische

Funktion besitzt, und zwar indem der situative Kontext (öffentlich versus privat) manipuliert wurde. Insgesamt nahmen 246 Probanden an dieser computerbasierten Studie, in der darüber hinaus noch für weitere Effekte (z.B. soziale Erwünschtheit) kontrolliert wurde, teil. Anders als in den vorherigen Studien wurden Weinverpackungen als Stimuli ausgewählt. Die Wahl war darauf zurückzuführen, dass Wein sowohl öffentlich als auch privat konsumiert wird und bereits Studien zur visuellen Harmonie von Weinverpackungen existieren. Nachdem die Teilnehmer einer Vignette (private oder öffentliche Situation) zugeordnet worden waren, sahen sie eine von zwei Weinverpackungen und machten Angaben zur Attraktivität, zur Harmonie, zu diversen Kontrollvariablen und persönlichen Informationen (Geschlechtsidentität, biologisches Geschlecht). Die Ergebnisse der doppelt moderierten Mediation bestätigten den positiven Haupteffekt visueller Harmonie und den indirekten Effekt über die Selbstkongruenz. Wie erwartet, zeigten die Ergebnisse außerdem eine Wechselwirkung zwischen dem biologischen Geschlecht, der Situation und der visuellen Harmonie auf den indirekten Effekt. Das bedeutet, dass Frauen harmonisches Design in öffentlichen Situationen bevorzugten, während Männer harmonisches Design in privaten Situationen präferierten. Somit spielt die Anwesenheit beziehungsweise Abwesenheit anderer Menschen in einer bestimmten Konsumsituation eine entscheidende Rolle beim Attraktivitätsempfinden von visuellem Design.

Insgesamt leisten diese sieben Studien einen entscheidenden Beitrag zur Design- und Geschlechterforschung und erweitern die Theorie auf vielfältige Art und Weise. Darüber hinaus helfen diese Erkenntnisse über die Unterschiede in der ästhetischen Beurteilung Marketingverantwortlichen und Designern dabei, das Erscheinungsbild von Produkten und Verpackungen zu optimieren und zielgruppengerecht zu positionieren. Beispielsweise ergibt sich für Unternehmen daraus, dass sie ihre Marketing Visuals mehr auf die Geschlechtsidentitäten ihrer Zielgruppe abstimmen und optimieren sollten, statt auf den plakativen Unterschied zwischen Mann und Frau zu setzen.

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Appendix

Appendix A: Pretest results

	Stimulus	M_{rank}	SD	M_{Pretest2}		Stimulus	M_{rank}	SD	M_{Pretest2}
1.		4.1	4.28	5.81	15.		14.8	3.74	
2.		5.6	5.38	5.09	16.		15.2	8.64	
3.		5.9	6.08	5.01	17.		15.4	5.78	
4.		6.2	4.47		18.		17.1	3.45	
5.		6.7	2.98		19.		17.3	4.17	
6.		6.9	2.77		20.		18.3	4.11	
7.		7.8	2.39		21.		18.7	6.13	
8.		8.0	5.16		22.		18.9	3.96	
9.		11.1	5.00		23.		19.8	5.18	3.21
10.		11.4	2.59		24.		20.4	3.53	2.93
11.		12.4	5.17		25.		24.8	.42	2.87
12.		12.5	6.35						
13.		12.8	5.59						
14.		12.8	8.13						

Notes: Before design and marketing experts ranked these stimuli on visual harmony, they read a brief definition of harmony in design (Henderson & Cote, 1998, p. 16). M_{Pretest2} = mean values for the three most harmonious and three least harmonious visuals on a seven-point semantic differential scale ranging from not at all harmonious (1) to harmonious (7) (Pretest 2).

Appendix B: Scale items and measurement statistics (Study 2-4)

Construct (Items)	Study 2					Study 3*					Study 4				
	IFC	M	SD	EV	α	IFC	M	SD	EV	α	IFC	M	SD	EV	A
Attractiveness (Hirschman, 1986)															
This symbol/ typeface/ package/ product is...															
...not attractive/attractive.	.89					-	2.56	1.19	-	-	.95				
...not beautiful/beautiful.	.85					-					.94				
...not appealing/appealing.	.78					-					.95				
		3.42	1.48	71%	.79							3.63	1.70	90%	.94
Harmony (Kumar & Garg, 2010)															
I find the design of this object...															
...harmonious/not at all harmonious.	-	4.06	1.85	-	-	-									
The elements of this design form a coherent, unified whole.	-	-	-	-	-	-	-	-	-	-	.95				
This design looks harmonious.	-	-	-	-	-	-	-	-	-	-	.95				
												4.58	1.71	90%	.90
CVPA (Bloch et al., 2003)															
Value															
Owning products that have superior designs makes me feel good about myself.	-						.86								
I enjoy seeing displays of products that have superior designs.	-						.82								
A product's design is a source of pleasure for me.	-						.81								
Beautiful product designs make our world a better place to live.	-						.75								
								3.26	.88	46%	.81				

Appendix

Acumen																	
Being able to see subtle differences in product designs is one skill that I have developed over time.	-									.86			.87				
I see things in a product's design that other people tend to pass over.	-									.84			.88				
I have a pretty good idea of what makes one product look better than its competitors.	-									.84			.83				
I have the ability to imagine how a product will fit in with designs of other things I already own.	-									.73			.82				
	-	-	-	-						2.96	.93	13%	.83	4.20	1.36	72%	.87
Response																	
Sometimes the way a product looks seems to reach out and grab me.	-									.91			-				
If a product's design really "speaks" to me, I feel that I must buy it.	-									.87			-				
When I see a product that has a really great design, I feel a strong urge to buy it.	-									.64			-				
	-	-	-	-						3.01	.97	9%	.75	-	-	-	-
Agreeableness (John & Srivastava, 1999)																	
I generally try to be thoughtful and considerate.	-									.85			-				
I try to be courteous to everyone I meet.	-									.78			-				
Some people think of me as cold and calculating. (r)	-									.66			-				
	-	-	-	-						4.29	.55	59%	.65	-	-	-	-

Loneliness (Russell, 1996)									
How often do you feel...									
...that there is no one you can turn to?	-	-	-	-	-	-	-	-	.86
...that there are people you can turn to? (r)	-	-	-	-	-	-	-	-	.84
...that there are people you can talk to? (r)	-	-	-	-	-	-	-	-	.80
...that there are people who really understand you? (r)	-	-	-	-	-	-	-	-	.77
...alone?	-	-	-	-	-	-	-	-	.69
...part of a group of friends? (r)	-	-	-	-	-	-	-	-	.67
...isolated from others?	-	-	-	-	-	-	-	-	.67
...that people are around you but not with you?	-	-	-	-	-	-	-	-	.62
	-	-	-	-	-	-	-	-	2.58 .98 55% .88
Fluency (Landwehr et al., 2011)									
Constructing a mental image of this stimuli...									
...feels difficult/feels easy.	-	-	-	-	-	-	-	-	.90
...takes a long time/happens instantly.	-	-	-	-	-	-	-	-	.90
...is exhausting/is relaxing.	-	-	-	-	-	-	-	-	.77
									4.61 1.40 74% .82
Gender identity (Choi et al., 2009)									
Feminine identity									
I am a person who (is)...									
...compassionate.	-	-	-	-	-	-	-	-	.84
...sensitive to the need of others.	-	-	-	-	-	-	-	-	.82
...eager to soothe hurt feelings.	-	-	-	-	-	-	-	-	.81

Appendix

...warm.	-	-															.81
...tender.	-	-															.74
...understanding.	-	-															.74
...affectionate.	-	-															.72
...sympathetic.	-	-															.72
...gentle.	-	-															.69
...loves children.	-	-															.53
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.21 .98 56% .91
Masculine identity																	
I am a person who (is)...																	
...forceful.	-	-															.82
...assertive.	-	-															.77
...willing to take stand.	-	-															.75
...dominant.	-	-															.73
...has leadership abilities.	-	-															.70
...has a strong personality.	-	-															.69
...defends own beliefs.	-	-															.63
...independent.	-	-															.41
...willing to take risks.	-	-															(.27)
...aggressive.	-	-															-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.70 .88 39% .85

Notes: *IFC* = Item-Factor-Correlation, *M* = Mean, *SD* = Standard Deviation, *EV* = Explained Variance, α = Cronbach's alpha, r = reverse coded, () = items removed from aggregate index. A criterion factor-variable correlation of .40 was selected as the minimum level for item inclusion (Lindeman et al., 1980). *Study 3 uses five-point scales.

Appendix B (cont'd): Scale items and measurement statistics (Study 5 and 7)

Construct (Items)	Study 5					Study 7				
	IFC	M	SD	EV	α	IFC	M	SD	EV	α
Attractiveness (Hirschman, 1986)										
This symbol/ typeface/ package/ product is...										
...not attractive/attractive.	.94					.95				
...not appealing/appealing.	.90					.94				
...not beautiful/beautiful.	.84					.94				
		4.04	1.68	80%	.87		3.73	1.55	89%	.94
Harmony (Kumar & Garg, 2010)										
I find the design of this object...										
...not at all harmonious/harmonious.									-	-
The elements of this design form a coherent, unified whole.	.93					.94				
This design looks harmonious.	.93					.94				
		4.54	1.68	87%	.84		4.64	1.63	87%	.86
CVPA (Bloch et al., 2003)										
Acumen										
Being able to see subtle differences in product designs is one skill that I have developed over time.	-					.88				
I see things in a product's design that other people tend to pass over.	-					.88				
I have a pretty good idea of what makes one product look better than its competitors.	-					.81				
I have the ability to imagine how a product will fit in with designs of other things I already own.	-					.81				
		-	-	-	-		4.40	1.39	71%	.86

Self-congruity (Sirgy et al., 1997)									
This stimulus is ... with how I see myself.									
...bad fit/good fit	-								.93
...not compatible/compatible	-								.93
...bad match/good match	-								.90
...irrelevant/relevant	-								.78
		-	-	-	-			3.40	1.51 79% .91
Gender identity (Choi et al., 2009)									
Feminine identity									
I am a person who (is)...									
...compassionate.	.65								.79
...sensitive to the need of others.	.66								.77
...eager to soothe hurt feelings.	.63								.74
...warm.	.79								.75
...tender.	.68								.77
...understanding.	.58								.75
...affectionate.	.64								.68
...sympathetic.	.55								.67
...gentle.	.80								.73
...loves children.	.49								.47
		5.54	.83	43%	.84			5.36	.92 52% .90
Masculine identity									
I am a person who (is)...									
...forceful.	(.39)								.80
...assertive.	.68								.79
...willing to take stand.	.68								.61
...dominant.	.74								.69
...has leadership abilities.	.64								.75
...has a strong personality.	.72								.77
...defends own beliefs.	.56								.65
...independent.	.41								.59

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...willing to take risks.	.61					.52				
...aggressive.	.59					(.23)				
		5.15	.88	37%	.81		4.91	.87	44%	.86
Masculine Appeal (Choi et al., 2009)										
This symbol/ typeface/ package/ product is...										
...not dominant/dominant.	.84					.90				
...not strong/strong.	.79					.76				
...not aggressive/aggressive.	.73					.73				
		3.95	1.44	62%	.68		3.31	1.26	64%	.71
Feminine Appeal (Choi et al., 2009)										
This symbol/ typeface/ package/ product is...										
...not tender/tender.	.80					.88				
...not gentle/gentle.	.86					.82				
...not warm/warm.	.81					.73				
		3.65	1.62	68%	.76		3.50	1.27	69%	.77
Design elaborateness (Henderson et al., 2003)										
This symbol/ typeface/ package/ product is...										
...passive/active.	-					.86				
...simple/complex.	-					.86				
		-	-	-	-		3.46	1.42	74%	.65
Brand familiarity (Schlosser, 2006)										
This brand is...										
...unfamiliar/familiar.	-	-	-	-	-	-	1.20	.69	-	-
Wine preference (Mueller et al., 2009)										
My preference for this wine (country of origin, type of vine, etc.) is...										
...low/high.	-	-	-	-	-	-	2.92	1.45	-	-

<i>Self-deceptive enhancement</i>										
(Marker & Schneider, 2015)										
My first impression of people normally proves to be true.	-									.75
I always know exactly why I like something.	-									.72
I am often unsure about my opinion. (r)	-									.68
	-	-	-	-	-					4.89 .94 52% .51
<i>Impression management</i>										
(Marker & Schneider, 2015)										
I have used somebody to my advantage now and then. (r)	-									.75
I have been given too much change but I haven't said anything about it. (r)	-									.72
I am always honest to other people.	-									.71
	-	-	-	-	-					3.53 1.25 53% .53

Notes: *IFC* = Item-Factor-Correlation, *M* = Mean, *SD* = Standard Deviation, *EV* = Explained Variance, α = Cronbach's alpha, r = reverse coded, () = items removed from aggregate index. A criterion factor-variable correlation of .40 was selected as the minimum level for item inclusion (Lindeman et al., 1980).

Appendix C: Testing the dynamic effect of visual harmony on attractiveness based on repeated evaluation (Study 3)

		T₁				T₂			
		Males		Females		Males		Females	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Harmony low	Typeface	2.54	1.20	2.25	1.16	2.48	1.17	2.26	1.12
	Logo	1.67	.78	1.73	.82	1.77	.91	1.91	.90
	Product	2.42	1.25	2.06	1.00	2.58	1.33	2.20	1.14
Harmony high	Typeface	2.74	1.10	3.08	1.08	3.17	1.13	3.54	1.11
	Logo	2.57	1.01	2.70	1.03	2.55	1.10	2.89	1.20
	Product	3.38	1.00	3.60	1.00	3.62	1.13	3.93	1.02

Notes: T₁ = initial rating phase, T₂ = second and last rating phase.

Predictors	F	p
Outcome: Attractiveness evaluation		
Stimulus	.29	.746
Stimulus x Sex	1.43	.240
Harmony	3.35	.049
Harmony x Sex	16.82	< .001
Phase	.85	.359
Phase x Sex	1.03	.311
Stimulus x Harmony	1.01	.366
Stimulus x Harmony x Sex	2.36	.100
Stimulus x Phase	.38	.686
Stimulus x Phase x Sex	.36	.701
Harmony x Phase	.03	.869
Harmony x Phase x Sex	.33	.568
Stimulus x Harmony x Phase	.57	.565
Stimulus x Harmony x Phase x Sex	.65	.525

Appendix D: Testing for moderated moderated mediation of respondent sex and situation (Study 7)

Predictor	b	SE	t
Self-congruity, adj. R² = .39, F(19, 220) = 7.39, p < .001			
Visual harmony	.84*	.34	2.49
Respondent sex	-.03 ^{ns}	.32	-.09
Visual harmony x Respondent sex	-.38 ^{ns}	.45	-.85
Situation	.39 ^{ns}	.32	1.19
Visual harmony x Situation	-1.08*	.47	-2.31
Respondent sex x Situation	-.53 ^{ns}	.46	-1.16
Visual harmony x Respondent sex x Situation	1.65*	.67	2.47
Familiarity	.01 ^{ns}	.12	.10
Visual elaborateness	.05 ^{ns}	.09	.56
Perceived harmony	.34***	.07	5.17
Preference	.30***	.06	5.25
Feminine appeal	.13 ^{ns}	.08	1.64
Masculine appeal	.17*	.07	2.31
Impression management	.09 ^{ns}	.07	1.39
Self-deceptive enhancement	-.09 ^{ns}	.10	-.96
Respondent age	.02 ^{ns}	.01	1.33
Design acumen	-.06 ^{ns}	.06	-.90
Feminine identity	-.04 ^{ns}	.09	-.40
Masculine identity	.13 ^{ns}	.11	1.11
Attractiveness, adj. R² = .65, F(20, 219) = 19.92, p < .001			
Self-congruity	.54***	.05	10.22
Visual harmony	-.06 ^{ns}	.27	-.23
Respondent sex	.52*	.25	2.04
Visual harmony x respondent sex	-.24 ^{ns}	.36	-.66
Situation	.38 ^{ns}	.26	1.48
Visual harmony x Situation	-.28 ^{ns}	.37	-.74
Respondent sex x Situation	-.52 ^{ns}	.36	-1.45
Visual harmony x	.33 ^{ns}	.54	.61

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Respondent sex x Situation					LL	UL
	Sex	Situation	b	Boot SE	95% CI	95% CI
Familiarity			.13 ^{ns}	.09		1.34
Visual elaborateness			.02 ^{ns}	.07		.33
Perceived harmony			.19 ^{**}	.06		3.34
Preference			.14 ^{**}	.05		2.92
Feminine appeal			.25 ^{***}	.06		4.05
Masculine appeal			.03 ^{ns}	.06		.44
Impression management			-.08 ^{ns}	.05		-1.58
Self-deceptive enhancement			-.12 ^{ns}	.08		-1.58
Respondent age			.01 ^{ns}	.01		.53
Design acumen			.00 ^{ns}	.05		.01
Feminine identity			-.09 ^{ns}	.08		-1.20
Masculine identity			.08 ^{ns}	.09		.92
Mediator	male	private	.46	.19	.10	.84
Self-congruity	male	public	-.13	.22	-.56	.31
	female	private	.25	.21	-.15	.67
	female	public	.56	.20	.21	.98

Notes: Unstandardized regression coefficients are reported. LL = Lower Limit, UL = Upper Limit, CI = Confidence Interval; *** p < .001, ** p < .01, * p < .05, ns = not significant.

Appendix E: Testing for moderated moderated mediation of feminine identity and situation (Study 7)

Predictor	b	SE	t
Self-congruity, adj. R² = .37, F(18, 221) = 7.26, p < .001			
Visual harmony	2.31 ^{ns}	1.49	1.55
Feminine identity	-.01 ^{ns}	.17	-.06
Visual harmony x Feminine identity	-.31 ^{ns}	.28	-1.14
Situation	.42 ^{ns}	1.26	.34
Visual harmony x Situation	-3.02 ^{ns}	2.01	-1.50
Feminine identity x Situation	-.06 ^{ns}	.24	-.26
Visual harmony x Feminine identity x Situation	.52 ^{ns}	.37	1.39
Familiarity	.01 ^{ns}	.12	.12
Visual elaborateness	.01 ^{ns}	.09	.06
Perceived harmony	.31 ^{***}	.07	4.67
Preference	.29 ^{***}	.06	4.94
Feminine appeal	.14 ^{ns}	.08	1.77
Masculine appeal	.17 [*]	.07	2.30
Impression management	.08 ^{ns}	.07	1.26
Self-deceptive enhancement	-.06 ^{ns}	.09	-.60
Respondent age	.01 ^{ns}	.01	1.07
Design acumen	-.04 ^{ns}	.06	-.70
Respondent sex	-.14 ^{ns}	.18	-.80
Attractiveness, adj. R² = .64, F(19, 220) = 20.80, p < .001			
Self-congruity	.54 ^{***}	.05	10.37
Visual harmony	1.41 ^{ns}	1.17	1.21
Feminine identity	.00 ^{ns}	.14	-.03
Visual harmony x Feminine identity	-.29 ^{ns}	.22	-1.35
Situation	.28 ^{ns}	.99	.29
Visual harmony x Situation	-1.23 ^{ns}	1.58	-.78
Feminine identity x Situation	-.03 ^{ns}	.19	-.17
Visual harmony x Feminine identity x Situation	.20 ^{ns}	.29	.70

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Familiarity			.11 ^{ns}	.09	1.21	
Visual elaborateness			.02 ^{ns}	.07	.25	
Perceived harmony			.18 ^{***}	.05	3.38	
Preference			.14 ^{**}	.05	2.95	
Feminine appeal			.25 ^{***}	.06	4.16	
Masculine appeal			.04 ^{ns}	.06	.63	
Impression management			-.09 ^{ns}	.05	-1.62	
Self-deceptive enhancement			-.08 ^{ns}	.07	-1.18	
Respondent age			.01 ^{ns}	.01	.61	
Design acumen			.00 ^{ns}	.05	-.06	
Respondent sex			.20 ^{ns}	.14	1.42	
	Feminine identity (M±SD)	Situation	b	Boot SE	LL 95% CI	UL 95% CI
Mediator	low	private	.51	.21	.12	.94
Self-congruity	low	public	.11	.24	-.35	.58
	medium	private	.35	.16	.07	.70
	medium	public	.21	.16	-.09	.55
	high	private	.19	.23	-.24	.67
	high	public	.31	.21	-.09	.72

Notes: Unstandardized regression coefficients are reported. LL = Lower Limit, UL = Upper Limit, CI = Confidence Interval; *** p < .001, ** p < .01, * p < .05, ns = not significant.

Appendix F: Testing for moderated moderated mediation of masculine identity and situation (Study 7)

Predictor	b	SE	t
Self-congruity, adj. R² = .37, F(18, 221) = 7.29, p < .001			
Visual harmony	-.66 ^{ns}	1.38	-.48
Masculine identity	-.07 ^{ns}	.19	-.34
Visual harmony x Masculine identity	.26 ^{ns}	.28	.94
Situation	-1.18 ^{ns}	1.24	-.95
Visual harmony x Situation	.70 ^{ns}	1.96	.36
Masculine identity x Situation	.26 ^{ns}	.25	1.04
Visual harmony x Masculine identity x Situation	-.19 ^{ns}	.40	-.48
Familiarity	.02 ^{ns}	.12	.15
Visual elaborateness	.00 ^{ns}	.09	.01
Perceived harmony	.30 ^{***}	.07	4.48
Preference	.29 ^{***}	.06	4.82
Feminine appeal	.13 ^{ns}	.08	1.63
Masculine appeal	.17 [*]	.07	2.29
Impression management	.09 ^{ns}	.07	1.28
Self-deceptive enhancement	-.11 ^{ns}	.10	-1.07
Respondent age	.01 ^{ns}	.01	.91
Design acumen	-.05 ^{ns}	.06	-.76
Respondent sex	-.08 ^{ns}	.18	-.47
Attractiveness, adj. R² = .64, F(19, 220) = 20.63, p < .001			
Self-congruity	.55 ^{***}	.05	10.36
Visual harmony	-.24 ^{ns}	1.09	-.22
Masculine identity	.13 ^{ns}	.15	.88
Visual harmony x Masculine identity	.02 ^{ns}	.22	.08
Situation	.59 ^{ns}	.97	.61
Visual harmony x Situation	-.79 ^{ns}	1.54	-.52
Masculine identity x Situation	-.10 ^{ns}	.20	-.50
Visual harmony x Masculine identity x Situation	.14 ^{ns}	.31	.45

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Familiarity			.12 ^{ns}	.09	1.23	
Visual elaborateness			.01 ^{ns}	.07	.18	
Perceived harmony			.18 ^{**}	.05	3.27	
Preference			.14 ^{**}	.05	2.91	
Feminine appeal			.24 ^{***}	.06	3.97	
Masculine appeal			.06 ^{ns}	.06	.94	
Impression management			-.07 ^{ns}	.05	-1.40	
Self-deceptive enhancement			-.12 ^{ns}	.08	-1.57	
Respondent age			.00 ^{ns}	.01	.38	
Design acumen			-.02 ^{ns}	.05	-.46	
Respondent sex			.20 ^{ns}	.14	1.40	
	Masculine identity (M±SD)	Situation	b	Boot SE	LL 95% CI	UL 95% CI
Mediator	low	private	.21	.20	-.17	.61
Self-congruity	low	public	.17	.18	-.20	.52
	medium	private	.33	.15	.06	.65
	medium	public	.21	.16	-.09	.57
	high	private	.46	.20	.09	.90
	high	public	.24	.24	-.24	.73

Notes: Unstandardized regression coefficients are reported. LL = Lower Limit, UL = Upper Limit, CI = Confidence Interval; *** p < .001, ** p < .01, * p < .05, ns = not significant.

Appendix G: Study 1 questionnaire

C	A	U	Christian-Albrechts-Universität zu Kiel	A & F Marketing - Consumer Psychology
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Produktdesign

Im Rahmen meiner Abschlussarbeit untersuche ich individuelle Reaktionen auf das Design von verschiedenen Produkten. Der Erfolg meiner Arbeit hängt von Ihrer Mithilfe ab!

Ihre Antworten werden selbstverständlich vertraulich behandelt. Sie bleiben **anonym** und Ihre Antworten werden nicht zu kommerziellen Zwecken verwendet!

Ich bitte Sie alle Fragen zu beantworten, da nur vollständig ausgefüllte Fragebögen in die Auswertung eingehen können. Es gibt weder „richtige“ noch „falsche“ Antworten. Die Teilnahme wird ca. 10 Minuten in Anspruch nehmen.

Vielen Dank für Ihre Zeit und Hilfsbereitschaft!

Im Folgenden sehen Sie sechs unterschiedliche Produktbilder¹.

Bitte schauen Sie sich diese Bilder in Ruhe und konzentriert an und geben an, inwieweit Sie den folgenden Aussagen zustimmen.

¹ Participants viewed and rated six randomly assigned stimuli (two lamps, two mobiles, and two chairs).



	Stimme voll und ganz zu						Stimme überhaupt nicht zu
	7	6	5	4	3	2	1
Das Design dieser Lampe wirkt ausbalanciert.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Form dieser Lampe ist unsymmetrisch.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Das Design dieser Lampe weist unterschiedliche Farben und/oder Formen auf.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Das Design besteht aus vielen verschiedenen Bestandteilen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die einzelnen Elemente des Designs sind symmetrisch angeordnet.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die Designelemente sind im Gleichgewicht.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Das Arrangement der Elemente wirkt ausgeglichen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die dunkleren Elemente stechen gegenüber den helleren Bereichen heraus.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kontrastreiche Farben treten nah beieinander auf.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die einzelnen Elemente wirken zufällig angeordnet.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Das gesamte Design dieser Lampe wirkt harmonisch.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Die einzelnen Designelemente ergeben ein einheitliches Gesamtbild.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Diese Lampe ist attraktiv.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Das gesamte Design dieser Lampe wirkt harmonisch.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Bitte geben Sie abschließend Ihr Alter und Geschlecht an:

Ich bin ____ Jahre alt und weiblich männlich

Vielen Dank für die Teilnahme!

Appendix H: Study 2 questionnaire

C	A	U	Christian-Albrechts-Universität zu Kiel	A & F Marketing - Consumer Psychology
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Visuelles Produktdesign

Im Rahmen einer wissenschaftlichen Studie ohne kommerziellen Auftraggeber untersuche ich individuelle Reaktionen auf visuelles Produktdesign. Der Erfolg meiner Arbeit hängt von Ihrer Mithilfe ab!

Sie bleiben selbstverständlich anonym!

Ich bitte Sie alle Fragen zu beantworten, da nur vollständig ausgefüllte Fragebögen in die Auswertung mit eingehen können. Es gibt weder „richtige“ noch „falsche“ Antworten.

Vielen Dank für Ihre Hilfsbereitschaft!

Bitte beurteilen Sie die vorliegenden Stimuli² anhand ihres Gesamteindrucks zu dem Kriterium „Harmonie“ des Designs. Geben Sie außerdem bitte an, wie attraktiv sie das Design finden.



Ich finde, das Design dieser Schriftart ist ...	7	6	5	4	3	2	1	
...ansprechend	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...nicht ansprechend
...nicht schön	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...schön
...attraktiv	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...unattraktiv
... harmonisch	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...unharmonisch

Bitte geben Sie abschließend noch Ihr Alter und Geschlecht an:

Ich bin ____ Jahre alt und weiblich männlich

Vielen Dank für die Teilnahme!

² Participants viewed and rated three of six randomly assigned stimuli (one randomly selected image from each of the three stimulus categories).

Appendix I: Study 3 questionnaire

C	A	U	Christian-Albrechts-Universität zu Kiel	A & F Marketing - Consumer Psychology
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Visuelles Design

Liebe Studienteilnehmerin, lieber Studienteilnehmer,

im Rahmen meiner Abschlussarbeit untersuche ich individuelle Reaktionen auf visuelles Produktdesign. Zur Durchführung dieser Studie bin ich auf Ihre Hilfe angewiesen!

Ihre Antworten werden selbstverständlich vertraulich behandelt. Sie bleiben **anonym** und Ihre Antworten werden nicht zu kommerziellen Zwecken verwendet.

Es können nur **vollständig** ausgefüllte Fragebögen in die Auswertung miteingehen. Bitte beantworten Sie daher **alle Fragen**, auch wenn diese sich zu wiederholen scheinen. Es gibt keine richtigen oder falschen Antworten.

Der Fragebogen setzt sich aus insgesamt zwei Teilen zusammen. Zunächst werden Sie gebeten, verschiedene Designs zu bewerten. Im zweiten Teil bitte ich Sie Angaben zu Ihrer Person zu machen. Die Teilnahme wird ca. 15 Minuten in Anspruch nehmen.

Vielen Dank für Ihre Zeit und Hilfsbereitschaft!

Teil A: Fragen zu den Stimuli³

Im Folgenden werden Ihnen verschiedene Produkte, Schrifttypen und Logos gezeigt. Schauen Sie sich die Stimuli bitte aufmerksam an und bewerten Sie diese dann nach ihrer Attraktivität.



Bitte geben Sie an, was am ehesten für Sie zutrifft.

Ich finde, dieses Produkt ist...	5	4	3	2	1	
...attraktiv	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...nicht attraktiv

Ihnen wird das vorgestellte Produkt nun mehrfach gezeigt. Bitte bewerten Sie dieses dabei anhand der ausgeführten Eigenschaften.

Es handelt sich jeweils um eine größere Anzahl von Eigenschaften, aber es ist wirklich sehr wichtig, dass Sie alle Fragen sorgfältig beantworten.

Ich finde, dieses Produkt ist...	Stimme voll und ganz zu	5	4	3	2	1	Stimme überhaupt nicht zu
...kreativ		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...extravagant		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...stilvoll		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...angenehm		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...durchdacht		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...ebenmäßig		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...einheitlich		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...verspielt		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...übersichtlich		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...ansprechend		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

³ Participants viewed and rated images, one by one, of the six stimuli (online survey).

Appendix

...exklusiv	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...elegant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...luxuriös	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...gleichmäßig	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...ausgeglichen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...komplex	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...geschmackvoll	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...hochwertig	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...kitschig	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...praktisch	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...innovativ	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...flippig	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...abschreckend	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...modern	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
...aufwendig	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Nun bewerten Sie bitte die dargestellten Produkte, Schrifttypen und Logos nach ihrer Attraktivität.

Bitte geben Sie an, was am ehesten für Sie zutrifft.

Ich finde, dieses Produkt ist...	5	4	3	2	1	
...attraktiv	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...nicht attraktiv

Teil B: Fragen zu Ihrer Person

Bitte geben Sie an, inwieweit Sie den folgenden Aussagen zustimmen.

	Stimme voll und ganz zu	5	4	3	2	1	Stimme überhaupt nicht zu
Ich bemühe mich, anderen Menschen stets höflich zu begegnen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Ich halte mich für rücksichtsvoll und aufmerksam im Umgang mit Anderen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Manche halten mich für kalt und berechnend.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Bitte geben Sie an, inwieweit Sie den folgenden Aussagen zustimmen.

	Stimme voll und ganz zu	5	4	3	2	1	Stimme überhaupt nicht zu
Ich fühle mich gut dabei, Produkte mit einem überlegenen Design zu besitzen.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Das Design eines Produktes bereitet mir Freude.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Ich genieße es Anzeigen von Produkten mit einem überlegenen Design zu betrachten.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Schöne Produktdesigns machen das Leben wertvoller.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Eine Fähigkeit von mir ist, dass ich feine Unterschiede in dem Design von Produkten wahrnehme.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Ich erkenne Dinge im Produktdesign, die andere eher übersehen.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Ich habe die Fähigkeit, mir vorstellen zu können, wie ein neues Produkt mit dem Design von Produkten zusammen passt, die ich bereits besitze.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Ich habe eine Vorstellung davon, was ein Produkt im Vergleich zu den Konkurrenzprodukten besser aussehen lässt.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Manchmal fasziniert und ergreift mich die Art und Weise, wie ein Produkt aussieht.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Wenn das Design eines Produktes zu mir „spricht“, muss ich es kaufen.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Wenn ich ein Produkt mit einem tollen Design sehe, empfinde ich einen starken Drang, es zu kaufen.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Ich bin ____ Jahre alt und weiblich männlich

Danke für die Teilnahme an dieser Studie!

Appendix J: Study 4 questionnaire

C	A	U	Christian-Albrechts-Universität zu Kiel	A & F Marketing - Consumer Psychology
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Visuelles Design

Liebe Studienteilnehmerin, lieber Studienteilnehmer,

bitte beantworten Sie die folgenden Fragen wahrheitsgemäß und so gut Sie können.
Sie bleiben selbstverständlich anonym und Ihre Daten werden nicht an Dritte weitergegeben.
Ihre Teilnahme an dieser nicht-kommerziellen Studie leistet einen großen Beitrag zum Gelingen dieser Arbeit.

Für Rückfragen wenden Sie sich bitte an: Kristina.Haberstroh@ae.uni-kiel.de

Vielen Dank für Ihre Zeit und Hilfsbereitschaft!

Kristina Haberstroh

Teil A: Fragen zu den Stimuli⁴

Betrachten Sie bitte das gezeigte **Logo**.



Bitte geben Sie an, was am ehesten für Sie zutrifft.

Dieses Logo ist...	7	6	5	4	3	2	1	
...attraktiv	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...nicht attraktiv
...schön	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...nicht schön
...ansprechend	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...nicht ansprechend

Mir das Logo bildlich mit geschlossenen Augen vorzustellen, ...	7	6	5	4	3	2	1	
...empfinde ich als leicht	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...empfinde ich als schwierig
...ist entspannend	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...ist anstrengend
...passiert sofort	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...dauert eine Weile

Bitte geben Sie an, inwieweit Sie den folgenden Aussagen zum Design des **Logos** zustimmen.

	Stimme voll und ganz zu	7	6	5	4	3	2	1	Stimme überhaupt nicht zu
Die Elemente dieses Designs bilden ein stimmiges und einheitliches Ganzes.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Dieses Design wirkt harmonisch.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

⁴ Participants viewed and rated three of six randomly assigned stimuli (one randomly selected image from each of the three stimulus categories).

Teil B: Fragen zu Ihrer Person

Ich bin ____ Jahre alt und weiblich männlich

Bitte geben Sie an, wie gut SIE die folgenden Eigenschaften beschreiben.

Ich bin eine Person, die ...(ist).	Immer richtig	7	6	5	4	3	2	1	Immer unrichtig
...für ihre Überzeugungen einsteht		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...herzlich		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...unabhängig		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...freundlich		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...eine starke Persönlichkeit hat		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...feinfühlig		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...durchsetzungsfähig		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...verständnisvoll		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...durchgreift		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...mitfühlend		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...Führungsqualitäten hat		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...darauf bedacht ist, verletzte Gefühle zu besänftigen		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...dominant		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...warm		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...Stellung bezieht		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...empfindsam		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...aggressiv		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...kinderlieb		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...furchtlos		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...sanft		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Bitte geben Sie an, inwieweit Sie den folgenden Aussagen zustimmen.

	Stimme voll und ganz zu	7	6	5	4	3	2	1	Stimme überhaupt nicht zu
Eine Fähigkeit von mir ist, dass ich feine Unterschiede in dem Design von Produkten wahrnehme.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Ich erkenne Dinge im Produktdesign, die andere eher übersehen.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Appendix

Ich habe die Fähigkeit, mir vorstellen zu können, wie ein neues Produkt mit dem Design von Produkten zusammen passt, die ich bereits besitze.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ich habe eine Vorstellung davon, was ein Produkt im Vergleich zu den Konkurrenzprodukten besser aussehen lässt.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Wie oft fühlst du(,) ...	Immer	7	6	5	4	3	2	1	Nie
... dass es niemanden gibt, an den du dich wenden kannst?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... dich einsam?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... dich als Teil einer Gruppe von Freunden?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... dich von anderen isoliert?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... dass es Menschen gibt, die dich wirklich verstehen?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... dass Menschen um dich sind, aber nicht mit dir?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... dass es Menschen gibt, mit denen du reden kannst?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... dass es Menschen gibt, an die du dich wenden kannst?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Danke für die Teilnahme an dieser Studie!

Appendix K: Study 5 questionnaire

C	A	U	Christian-Albrechts-Universität zu Kiel	A & F Marketing - Consumer Psychology
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Product design

Dear participants,

In the context of a doctoral dissertation, this study examines how people perceive and respond to visual design. Your help is very important for successfully completing this research project.

You remain completely anonymous!

Your answers will be treated confidentially and will not be used for commercial purposes.

How to participate:

Please answer all the questions as best as you can.

There are no right or wrong answers. I am merely interested in your honest opinion.

For further information, feel free to contact me: Kristina.Haberstroh@ae.uni-kiel.de

Thank you very much for your time and support!

Kristina Haberstroh

Part A: Questions about 3 visuals⁵

Please study the following typeface and then indicate how much you agree or disagree with each of the following statements.



For each statement please indicate your position towards the statement on the given scales.

This typeface is...	7	6	5	4	3	2	1	
...attractive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...not attractive
...not beautiful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...beautiful
...appealing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...not appealing
...not strong	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...strong
...dominant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...not dominant
...not aggressive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...aggressive
...warm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...not warm
...not tender	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...tender
...gentle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...not gentle

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

	Strongly agree	7	6	5	4	3	2	1	Strongly disagree
The elements of this design form a coherent, unified whole.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This design looks harmonious.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

⁵ Participants viewed and rated three of six randomly assigned stimuli (one randomly selected image from each of the three stimulus categories) (online survey).

Part B: A Few Questions about You

Please indicate on the following scale how well each of the following traits describes YOU.

I am a person who (is)...	Always true	7	6	5	4	3	2	1	Always untrue
...defends own beliefs.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...affectionate.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...independent.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...sympathetic.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...strong personality.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...sensitive to the need of others.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...assertive.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...understanding.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...forceful.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...compassionate.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...has leadership abilities.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...eager to soothe hurt feelings.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...dominant.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...warm.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...willing to take a stand.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...tender.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...aggressive.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...love children.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...willing to take risks.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...gentle.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

I am ____ years old and

female

male

Thank you for participating in this study!

Appendix L: Study 6 questionnaire

C	A	U	Christian-Albrechts-Universität zu Kiel	A & F Marketing - Consumer Psychology
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Liebe Studienteilnehmerin, lieber Studienteilnehmer,
 bitte beantworten Sie die folgenden Fragen wahrheitsgemäß und so gut Sie können.
 Sie bleiben selbstverständlich anonym und Ihre Daten werden nicht an Dritte weitergegeben.
 Ihre Teilnahme an dieser nicht-kommerziellen Studie leistet einen großen Beitrag zum
 Gelingen dieser Arbeit.
 Für Rückfragen wenden Sie sich bitte an: Kristina.Haberstroh@ae.uni-kiel.de

Vielen Dank für Ihre Zeit und Hilfsbereitschaft!

Ich bin ____ Jahre alt und weiblich männlich

Bitte geben Sie an, wie gut SIE die folgenden Eigenschaften beschreiben.

Ich bin eine Person, die ...(ist).	Immer richtig	7	6	5	4	3	2	1	Immer unrichtig
...für ihre Überzeugungen einsteht		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...herzlich		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...unabhängig		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...freundlich		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...eine starke Persönlichkeit hat		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...feinfühlig		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...durchsetzungsfähig		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...verständnisvoll		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...durchgreift		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...mitfühlend		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...Führungsqualitäten hat		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...darauf bedacht ist, verletzte Gefühle zu besänftigen		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...dominant		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...warm		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...Stellung bezieht		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...empfindsam		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...aggressiv		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...kinderlieb		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...furchtlos		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...sanft		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Appendix M: Study 7 questionnaire

C	A	U	Christian-Albrechts-Universität zu Kiel	A & F Marketing - Consumer Psychology
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Weinverpackungen

Liebe Studienteilnehmerin, lieber Studienteilnehmer,
im Rahmen einer wissenschaftlichen Arbeit untersucht diese Studie die Wahrnehmung und Beurteilung von Verpackungsdesign. Ihre Teilnahme an dieser nicht-kommerziellen Studie leistet einen großen Beitrag zum Gelingen dieser Arbeit.

Bitte beantworten Sie die folgenden Fragen wahrheitsgemäß und so gut Sie können. Sie bleiben selbstverständlich anonym und Ihre Daten werden nicht an Dritte weitergegeben.

Für Rückfragen wenden Sie sich bitte an: Kristina.Haberstroh@ae.uni-kiel.de

Vielen Dank für Ihre Zeit und Hilfsbereitschaft!

Kristina Haberstroh

Bitte geben Sie zunächst Ihr Geschlecht an.

Ich bin weiblich männlich⁶.

Stellen Sie sich nun vor, Sie sind heute Abend allein zu Hause und möchten gemütlich ein Glas Wein genießen. Dafür suchen Sie im Fachgeschäft eine Flasche aus. Denken Sie bei der Beantwortung der folgenden Fragen immer daran, dass Ihre Auswahl nur Sie persönlich betrifft und nicht von anderen beurteilt wird.

oder

Stellen Sie sich nun vor, Sie haben heute Abend Freunde eingeladen und möchten mit diesen gemeinsam eine Flasche Wein genießen. Dafür suchen Sie im Fachgeschäft eine Flasche aus. Denken Sie bei der Beantwortung der folgenden Fragen immer daran, dass Ihre Auswahl vor allem von Ihren Gästen beurteilt wird und nicht nur Sie persönlich betrifft.

⁶serves as a filter variable (online survey).

Teil A: Fragen zu der Verpackung (Design der Weinflasche) als Ganzes

Sehen Sie sich bitte die gezeigte Weinflasche in Ruhe an und beantworten dann die folgenden Fragen:



Bitte kreuzen Sie an, was am ehesten für Sie zutrifft.

Ich finde, die Weinflasche ist...	7	6	5	4	3	2	1	
...attraktiv	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...nicht attraktiv
...schön	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...nicht schön
...ansprechend	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...nicht ansprechend
...stark	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...nicht stark
...dominant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...nicht dominant
...aggressiv	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...nicht aggressiv
...warm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...nicht warm
...empfindsam	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...nicht empfindsam
...sanft	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...nicht sanft
...feminin	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...maskulin
...beladen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...schlicht
...aktiv	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...passiv

Bitte geben Sie an, inwieweit der Stimulus mit **Ihrem Selbstbild** übereinstimmt.

Diese Verpackung ist...	7	6	5	4	3	2	1	
...kompatibel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...nicht kompatibel
...passend	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...unpassend
...relevant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...irrelevant
...übereinstimmend	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...nicht übereinstimmend mit

Bitte geben Sie an, inwieweit Sie den folgenden Aussagen zum Design der Verpackung zustimmen.

	Stimme voll und ganz zu	7	6	5	4	3	2	1	Stimme überhaupt nicht zu
Die Elemente dieses Designs bilden ein stimmiges und einheitliches Ganzes.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Dieses Design wirkt harmonisch.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Diese Marke ist mir...	7	6	5	4	3	2	1	
...überhaupt nicht bekannt	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...sehr gut bekannt

Meine Präferenz für diesen Wein (Rebsorte, Herkunft, etc.) ist...	7	6	5	4	3	2	1	
...sehr hoch	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	...sehr niedrig

Teil B: Fragen zu Ihrer Person

Ich bin ____ Jahre alt.

Bitte geben Sie an, wie gut die folgenden Eigenschaften Sie als Person beschreiben.

Ich bin eine Person, die ...	Immer richtig	7	6	5	4	3	2	1	Immer unrichtig
...für ihre Überzeugungen einsteht		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...herzlich ist		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...unabhängig ist		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...freundlich ist		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...eine starke Persönlichkeit hat		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...feinfühlig ist		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...durchsetzungsfähig ist		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...verständnisvoll ist		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...durchgreift		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...mitfühlend ist		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...Führungsqualitäten hat		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...darauf bedacht ist, verletzte Gefühle zu besänftigen		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...dominant ist		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...warm ist		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...Stellung bezieht		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...empfindsam ist		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...aggressiv ist		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...kinderlieb ist		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...furchtlos ist		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
...sanft ist		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Bitte geben Sie an, inwieweit Sie den folgenden Aussagen zustimmen.

	Stimme voll und ganz zu	7	6	5	4	3	2	1	Stimme überhaupt nicht zu
Eine Fähigkeit von mir ist, dass ich feine Unterschiede in dem Design von Produkten wahrnehme.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Ich erkenne Dinge im Produktdesign, die andere eher übersehen.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Ich habe die Fähigkeit, mir vorstellen zu können, wie ein neues Produkt mit dem Design von Produkten zusammen passt, die ich bereits besitze.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Ich habe eine Vorstellung davon, was ein Produkt im Vergleich zu den Konkurrenzprodukten besser aussehen lässt.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Bitte geben Sie an, inwieweit Sie den folgenden Aussagen zustimmen.

	Stimme voll und ganz zu	7	6	5	4	3	2	1	Stimme überhaupt nicht zu
Mein erster Eindruck von Menschen stellt sich gewöhnlich als richtig heraus.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Ich bin mir oft unsicher in meinem Urteil.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Ich weiß immer genau, wieso ich etwas mag.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Ich habe schon mal zu viel Wechselgeld zurückbekommen und nichts gesagt.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Ich bin immer ehrlich zu anderen.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Ich habe gelegentlich mal jemanden ausgenutzt.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Bitte geben Sie an, was am ehesten zutrifft.

	7	6	5	4	3	2	1	
Der Wein ist hauptsächlich für den privaten Gebrauch bestimmt.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Der Wein ist hauptsächlich für den öffentlichen Gebrauch bestimmt.
Der Wein ist hauptsächlich für die Aufmerksamkeit anderer bestimmt.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Der Wein ist hauptsächlich für meine Beurteilung bestimmt.

Danke für die Teilnahme an dieser Studie!

LEBENS LAUF

KRISTINA HABERSTROH

Geburtsdatum und –ort:

29. August 1987 in Preetz

Staatsangehörigkeit:

deutsch

BERUFLICHER WERDEGANG

- 06/2013 – RESEARCH ASSISTANT
Heute Christian-Albrechts-Universität zu Kiel,
A&F Marketing - Consumer Psychology
- 09/2012 – PRODUKTMANAGEMENT
02/2013 (PRAKTIKUM)
apetito convenience GmbH & Co.KG, Rheine
- 09/2010 STUDENT ASSISTANT
08/2012 Christian-Albrechts-Universität zu Kiel,
Ernährungswirtschaft und Verbrauchslehre
- 09/2010 – ÖFFENTLICHKEITSARBEIT
03/2011 (PRAKTIKUM & FREIE MITARBEIT)
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AUSBILDUNG

- 06/2013 – PROMOTION
07/2017 Christian-Albrechts-Universität zu Kiel,
A&F Marketing - Consumer Psychology
- 04/2011 – MASTER
01/2013 IN ÖKOTROPHOLOGIE (M.Sc.)
Christian-Albrechts-Universität zu Kiel,
Schwerpunkt Ernährungs- und Verbraucherökonomie
- 10/2007 – BACHELOR
02/2011 IN ÖKOTROPHOLOGIE (B.Sc.)
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06/2007 Gymnasium Humboldt-Schule, Kiel

PUBLIKATIONEN

Haberstroh, K., Orth, U.R., Bouzdine-Chameeva, T., Corsi, A., Cohen, J., Crouch, R., & De Marchi, R. (2017). Through the Lens of Self-Construal: Cross-Cultural Variation in Consumers' Appreciation of Harmony in Marketing Visuals. *International Marketing Review*, in press.

Haberstroh, K. & Orth, U.R. (2017). I" Value Contrast, but "We" Appreciate Harmony: Self-Construal Reflects Cultural Differences in Response to Visual Design. In E. Gurel-Atay & L. Kahle (Eds.), *Consumer Social Values*, in press.

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Orth, U. & Haberstroh, K. (2015). Moralische Entkopplung: Ein Erklärungsansatz zum (un)-verantwortlichen Handeln von Konsumenten. *Schriftenreihe der Agrar- und Ernährungs-wissenschaftlichen Fakultät der Universität Kiel*, Vorträge zur Hochschultagung 2015, Heft 122, 150-155.

PRÄSENTATIONEN

- 01/2017 "Management der Markenkommunikation", openCampus (Bildungscluster der starterkitchen Kiel), Kiel, Deutschland
- 09/2016 "Gender Marketing: Die Rolle visueller Harmonie", Marketingimpulse des Marketing Club Schleswig-Holstein e.V., Kiel, Deutschland
- 09/2016 "Finding Harmony Between Gender Identity and Design Preferences of Consumers", EMAC Junior Faculty & Doctoral Student Research Camp, Wien, Österreich
- 02/2016 "Designing Culturally Specific Wine Packages: The Case of Visual Harmony", AWBR Conference, Adelaide, Australien
- 02/2015 "Moralische Entkopplung: Ein Erklärungsansatz zum (un)verantwortlichen Handeln von Konsumenten", Hochschultagung der Agrar- und Ernährungs-wissenschaftlichen Fakultät, Kiel, Deutschland
- 08/2014 "I" Value Contrast, but "We" Appreciate Harmony: Self-construal Reflects Cultural Differences in Response to Visual Design, AMA Summer Marketing Educators' Pre-Conference, San Francisco, USA

AUSZEICHNUNGEN

- 10/2016 **Best Student Paper Award**, PDMA Research Forum, Atlanta, USA
- 11/2015 **DAAD-Reisestipendium**

Kiel, im Juli 2017