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Essays on Product Design and Consumer Behavior
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ABSTRACT

Product design has been recognized to be a strategic asset for companies to gain a competitive advantage in the marketplace and to differentiate themselves from competitors. Accordingly, companies invest heavily in product design. While existing research has mostly focused on how companies design products (e.g., whether the product design is functional or innovative), marketing scholars called for more research on how consumers react to product design (e.g., whether the product design creates value in the eyes of consumers). This dissertation investigates how product design can affect consumers' psychological and behavioral responses with a focus on specific elements of a product design (i.e., brand logo prominence) and specific product categories (i.e., performance products and upcycled products).

The first essay advances the debate on when and why brands should display prominent (large) versus subtle (small) logos on their products. This research demonstrates that consumers have a stronger preference for products with prominent logos (vs. subtle logos) in performance contexts, which require consumers to possess certain skills, than in non-performance contexts. This is because consumers may utilize prominent logos to signal to themselves that they are competent.

The second essay develops and validates a new scale that enables the identification and classification of products along the performance dimension, which differs from previous product classifications. This scale can support researchers to develop a better understanding of consumers' product preferences and behavior.

The third essay examines which product characteristics drive the appeal of upcycled products—that is, products made out of components of old or unwanted products. This research shows that consumers find upcycled products more appealing when they are made out of an old product with a dissimilar (vs. similar) function because of higher creativity perceptions. This research unearths a novel path how to create value of existing resources without consuming new ones.

Beyond expanding the extant literature on product design and consumer behavior, this dissertation contributes to increase managers' awareness about how to adapt and optimize their products' design.

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1 INTRODUCTION

In a world full of products that intensely compete with each other, product design has been recognized to be a strategic asset for companies to gain advantage in the marketplace and to differentiate themselves from competitors (Bloch 1995; Heitmann et al. 2016; Homburg et al. 2015; Kotler and Rath 1984; Jindal et al. 2016; Noble and Kumar 2010). The design of a product can communicate information to consumers (Bloch et al. 2003; Carpenter et al. 1994), attract consumers' attention (Bloch 1995), and affect consumers' consumption behavior (Dahl et al. 1999; Luchs et al. 2015). Hence, companies heavily invest in product design because it may contribute to their success (Gemser and Leenders 2001; McKinsey Quarterly 2018). For example, Apple, the largest tech company in the world, owes much of its success to its innovative and distinctive product design (Brunner et al. 2008).

Product design refers to a specific set of constitutive elements of the product, such as shape, size, materials, colors, and ornamentations (Bloch 1995). Extant literature suggests that a product design may elicit a variety of psychological responses in consumers that go beyond the mere product attractiveness based on their personal taste (Bloch 1995; Lewalski 1988). Specifically, consumers develop *beliefs* about the product and its brand based on how they *perceive* a product design, which in turn can affect their consumption behavior. For example, product design can affect consumers' judgement of the product functionality (Hoegg and Alba 2011; Homburg et al. 2015), or can communicate them a symbolic message about the own identity (Belk 1988; Homburg et al. 2015; McCracken 1986). Hence, consumers show positive responses towards a product not only because of their personal taste, but also because of their beliefs about the product based on how they perceive its design.

A comprehensive review of the extant research on product design in the marketing field by Luchs, Swan, and Creusen (2015) calls for more research on the topic. Extant research has indeed mostly focused on how companies design products (e.g., whether the

product design is functional or innovative) rather than on how consumers perceive and evaluate product design (e.g., whether the product design creates value in the eyes of consumers) (Luchs and Swan 2011). Shedding light on the relationship between product design and consumer behavior would allow firms to adapt and optimize their products' appearance and to leverage product design as a successful marketing tool. This dissertation therefore aims to advance our understanding of how product design affects consumers' psychological and behavioral responses by looking at specific elements of a product design (i.e. brand logo prominence – Chapter 2) and specific product categories (i.e. performance products – Chapter 3; and upcycled products – Chapter 4).

In the first essay (Chapter 2), I aim to advance the debate on when and why brands should display prominent (large) versus subtle (small) logos on their products. In ten studies, I show that in performance contexts, which require consumers to possess certain skills, consumers have a stronger preference for products with prominent logos (vs. subtle logos) than in non-performance contexts. This is because in performance contexts, which encompass, among others, recreational and professional activities such as sports, cooking, and home renovations, consumers tend to utilize prominent logos to signal to themselves that they are competent (i.e., self-efficacious). In line with my theorizing, I also show that the effect on logo prominence preference is attenuated when the performed activity is easy (vs. difficult), when consumers' self-improvement motivation is low (vs. high), and when the brand is not specialized (vs. specialized) in the performed activity. The findings of this research provide important theoretical contributions to the literature on brand prominence (e.g., by showing that prominent logos can have a self-signaling function beyond a social signaling function) and to the literature on self-efficacy (e.g., by uncovering logo prominence as an additional antecedent of self-efficacy). From a substantial standpoint, these findings might provide guidelines to companies to design products used in performance contexts.

In the second essay (Chapter 3), I develop and validate a new scale that enables the identification and classification of products along the performance dimension. I demonstrate that the performance dimension of products is distinct from existing classification schemes based on products' utilitarian versus hedonic value (Voss, Spangenberg, and Grohmann 2003) and identity-relevant versus irrelevant characteristics (Berger and Heath 2007). This new classification can therefore generate novel theoretical and substantive insights into consumers' decision processes and product design preferences.

In the third essay (Chapter 4), I examine which product characteristics drive the appeal of upcycled products—that is, products made out of components of old or unwanted products (e.g., a bench made with old skis). Upcycling is a sustainable practice that is increasingly successful in the marketplace and that promotes the reuse of resources that would otherwise be wasted. Rather than focusing on sustainability, this research theorizes that perceived creativity is an important driver of the growing popularity of upcycled products. Seven studies demonstrate that the appeal of upcycled products increases when they consist of components from an old product with a dissimilar (vs. similar) function because of higher creativity perceptions. These studies also show that enhanced perceptions of creativity only increase product appeal when consumers are more (vs. less) open to experience and when purchasing motives center more on the experiential (vs. functional) value of a product. These findings provide important theoretical contributions to the so-far-little empirical research on upcycling (e.g., by showing when and why their design can increase their value) and advance the literature on creativity (e.g., by providing novel antecedents and consequences of creativity perceptions). From a substantial standpoint, these findings might unearth a novel path for companies on how to create value of existing resources without consuming new ones.

Taken together, this dissertation advances the understanding of how consumers' perceptions of product design affect their psychological and behavioral responses, with a focus on brand logo prominence, performance products and upcycled products. Moreover, the

findings of this dissertation offer important managerial implications by increasing managers' awareness about how to adapt and optimize their products' design. All three essays were written together with other authors; in each essay, I contributed at every stage of the process from the idea conceptualization, to designing and running the studies, analyzing the data, and writing the manuscript.

2 WHEN PROMINENT LOGOS MAKE CONSUMERS FEEL COMPETENT

Virtually every brand has a logo, a symbol or marker that identifies the brand and its products. Given the importance of brand logos in grabbing consumers' attention, differentiating products, and communicating a brand's identity (e.g., Henderson and Cote 1998; Keller, Parameswaran, and Jacob 2011; MacInnis, Shapiro, and Mani 1999; Park et al. 2012), companies invest millions of dollars in designing and managing brand logos (Jiang et al. 2016; Kohli and Suri 2002). A critical decision for brands is to decide how prominently their logos should be displayed on their products. On the one hand, prominent brand logos (i.e., large brand markers) on products can help brands create awareness, and can help both brands and consumers communicate and express their identity to the broader public (e.g., Kapferer 2010; Keller 2009). On the other hand, prominent logos can evoke negative connotations. Because consumers often buy products with prominent logos to associate themselves with aspirational groups, to which they typically do not belong, prominent logos have been linked to counterfeiting, bragging, low product quality, as well as to lower-class consumers particularly in the context of high-end product categories (Berger and Ward 2010; Kapferer 2010; Han, Nunes, and Drèze 2010; Rucker and Galinsky 2009; Wilcox, Kim, and Sen 2009). In light of these negative connotations of prominent logos, practitioners have voiced concerns about the use of prominent brand logos on products (Boroujerdi and Wolf 2015; Lutz 2015; The NPD Group 2016).

The present research seeks to advance the debate on when and why consumers have a stronger preference for prominent (large) versus subtle (small) logos. Building on a self-signaling framework, we propose that a brand logo may serve as a signal of self-efficacy, which may lead consumers to have a stronger preference for prominent (versus subtle) logos when they use products to perform activities that *require skill* and hence when they have a heightened desire to feel efficacious, that is, to feel to be competent in the activity. We posit

that in such performance-related contexts, which encompass, among others, recreational and professional activities such as sports, cooking, and home renovations, consumers may utilize prominent logos to signal to themselves that they are competent. This self-signaling motivation—consumers’ desire to feel competent in a task or activity that requires skill—goes beyond consumers’ social signaling motives, which have been the main focus of previous brand logo research, and emerges regardless consumers’ baseline expertise.

In ten studies, we document the proposed effect of logo prominence on product preferences and provide evidence for the proposed theoretical framework and psychological process. We also delineate activity, consumer, and product factors that moderate consumers’ preference for prominent logos in performance contexts. Specifically, we examine the role of difficulty (vs. ease) of the performed activity, consumers’ high (vs. low) motivation to improve, and high (vs. low) brand specialization in moderating the proposed effect.

Our findings make several new contributions to theory and practice. First, our research contributes to the literature on brand logo prominence by identifying an important, yet previously unexplored, factor—signaling competence—that enables prominent logos to create value for consumers and brands. Our findings develop the understanding of the *self*-focused facet of signaling through brand prominence that goes beyond social signaling motives. While previous literature has shown that preferences for prominent logos are motivated primarily by how consumers want to be seen by others, our research shows that in performance contexts these preferences are shaped by how consumers want to see and feel about *themselves*.

Second, our research contributes to the literature on self-efficacy (Bandura 1994; Schunk 1995) which is the theoretical foundation of our proposed competence-signaling account. Self-efficacy, the feeling that one has the abilities and competence necessary to successfully complete a specific task, has been shown to affect behaviors such as individuals’ inclination to work hard and persist in a given task (Bandura 1982; Schunk and Pajares 2005). We advance this literature by identifying brand logo size as a new antecedent of self-efficacy

and by showing how the prospect of feeling efficacious can affect consumption preferences. Our findings show that an anticipated boost in feelings of efficacy, instigated by prominent brand logos, can affect consumption preferences and choice.

Third, we introduce a new classification of products along the performance dimension. We define performance products as products that are associated with completing tasks that require skill, and we show that this classification generates novel theoretical and substantive insights into consumers' decision processes. Apart from its theoretical value, the proposed classification of products into performance (vs. non-performance) categories is valuable from a substantive standpoint, as the share of performance products in the consumer goods market is substantial and rapidly growing. The market for performance products is significant both in terms of size and growth. For example, the sales of kitchen tools alone (used in cooking activities which require culinary skills) amounted to \$1.2 billion in the United States in 2017 (Statista 2019); the sales of hand tools (used in home repair activities which require handyman skills) the same year amounted to \$14.8 billion worldwide and were projected to grow by another \$3 billion by 2020 (Future Market Insights 2017); and the sales of sports apparel products (used in sports activities which require athletic skills) amounted to \$173.78 billion in 2018, with average an annual growth rate of \$5 billion (Statista 2019). Hence, understanding consumers' unique motivations and decisions in performance categories is both theoretically and practically important. Next, we develop our theory and predictions.

2.1 Theoretical Framework

2.1.1 Social Signaling with Brand Logos

Several studies examine the effect of brand logo prominence on consumers' product preferences. To explain why consumers may prefer subtle or prominent logos, these studies

primarily rely on social signaling processes and refer to individuals' desire to signal status to others and to express their belonging to an aspirational group (e.g., Berger and Heath 2007; Braun and Wicklund 1989; Charles, Hurst, and Roussanov 2009). Prominent logos have been shown to be particularly well-suited for social signaling because such logos can be readily observed and evaluated by others.

Social signaling associated with prominent logos, however, can lead to negative connotations and consequences. For example, Berger and Ward (2010) show that consumers with high cultural capital avoid prominent logos because they do not want to be associated with less knowledgeable consumers, who are perceived to use prominent logos to associate with higher-status aspirational groups. In a related study, Han et al. (2010) propose that consumers use the size of brand logos on status goods to signal membership in high-status groups. Specifically, less affluent consumers with a high need for status display prominent logos on status products to associate themselves with more affluent groups, whereas affluent consumers display subtle or no logos on products to dissociate themselves from less affluent groups. Taken together, these studies suggest that social signaling motives attributed to prominent logos may often be perceived as an attempt to mislead others about social status or group membership. This may explain why prominent logos are often associated with low-status individuals and displayed on relatively cheap or lower-quality products as well as counterfeits, particularly within high-end product categories (Han et al. 2010; Wilcox et al. 2009). It is therefore not surprising that branding experts often advise brands to refrain from using large logos (e.g., Boroujerdi and Wolf 2015; Fontana, Girod, and Králic 2019; Lutz 2015; The NPD Group 2016).

In a novel departure from that research, we propose that prominent logos can evoke a previously unexamined positive connotation and consequence for consumers and brands. Specifically, we propose that in certain contexts and product categories, displaying prominent logos may serve a *self*-signaling function and positively affect consumers' feelings of

competence. We propose that this effect materializes in performance contexts in which individuals perform activities that require skill. In such contexts, consumers should experience a heightened need to feel efficacious and competent. We expect that prominent logos will satisfy this need by bolstering consumers' feelings of competence.¹ In non-performance contexts, in which the skill requirement is absent and hence consumers' need to feel efficacious is not salient, we do not expect prominent logos to impact consumers' feelings of competence. Hence, we propose that consumers' preferences for prominent (vs. subtle) brand logos will be stronger in performance (vs. non-performance) contexts.

Next, we define performance contexts and performance products, and we delineate how the proposed classification of products along the performance dimension is different from existing product classifications in the literature. We then explain how and why performance contexts and categories distinctly drive consumers' preferences for products generally, and for brand logo size on products, more specifically.

2.1.2 Performance Contexts and Performance Products

We conceptualize performance contexts as contexts in which product users carry out activities that require skill. Examples span vocational, recreational, and professional activities such as cooking, home renovation, playing musical instruments, doing or playing sports (e.g., skiing, mountaineering, playing tennis), and designing artifacts, among others. What these activities have in common is that they require individuals to have a specific skillset to effectively perform the task at hand. Individuals need to possess specific skills, for example, to play a musical instrument or to climb a mountain. Accordingly, we conceptualize performance products as products that are used in performance contexts. We define

¹ The proposed phenomenon may not necessarily vary with consumers' inherent levels of expertise in the product-related activity because individuals with both limited and extensive levels of expertise share the need to feel competent when performing a skill-based activity (e.g., Gao, Wheeler, and Shiv 2009; Kim, Park, and Dubois 2018).

performance products as products that are integral to enabling or assisting consumers to carry out activities that require certain skills.

Performance products serve various functions to enable or assist consumers to engage in skill-based activities. While the use of performance products often helps consumers attain proficiency needed to perform such activities, it does not necessarily need to directly improve the skills required for such activities. For example, an amplifier for guitar instruments might not directly help individuals improve their guitar-playing skills; however, it facilitates consumers' engagement in guitar-playing activity. Similarly, while using a toolbox to organize and carry tools does not directly improve one's home repair skills, or an apron does not directly improve one's culinary skills, these products facilitate consumers' engagement in home repair and cooking activities, respectively.

The proposed classification of products along the performance dimension is both theoretically novel and practically valuable. Importantly, it is distinct from existing product classifications examined in the literature including product utilitarianism (vs. hedonism) and identity relevance (vs. irrelevance). First, performance products are conceptually distinct from utilitarian products: although utilitarian products are instrumental for accomplishing practical tasks (Dhar and Wertenbroch 2000; Strahilevitz and Myers 1998), these tasks do not necessarily require skills in the way that activities involving performance products do. For example, whereas soap is instrumental for the practical task of cleaning one's hands, cleaning hands does not require a specific skill. Accordingly, soap is a utilitarian product (Armstrong 2010), but not a performance product. Second, performance products are conceptually distinct from identity-relevant (symbolic) products (Berger and Heath 2007). Whereas performance products may sometimes be used in identity-relevant domains (e.g., cooking may be central to an individual's identity), not all identity-relevant domains have a performance dimension. For example, though a tie-dye shirt and a cowboy hat may be highly identity-relevant to some consumers (since they can help consumers communicate their hippie or Southern identity),

these products are not necessarily linked to activities that require certain skills. Therefore, not all identity-relevant products are characterized as performance products.

To operationalize the extent to which a product is performance-related and to verify that the proposed performance categorization is distinct from the aforementioned existing product categorizations, we followed established scale development procedures (e.g., Churchill 1979; DeVellis 2016; Netemeyer, Bearden, and Sharma 2003) to develop a short, reliable, and valid measurement scale. In four studies (N = 1,423 participants), we established the scale's content validity (which was assessed by external judges), convergent validity, discriminant validity, nomological validity, and predictive validity, as well as its reliability. Chapter 3 details the methodology utilized in the scale development process as well as the results. The scale that emerged from this procedure consisted of four items: "This product can be associated with: skills related to performing an activity; competency in an activity; proficiency at performing an activity; practicing and exercising." The scale was able to successfully identify performance (vs. non-performance) products (i.e. which, respectively, scored high vs. low on the performance dimension), and to distinguish these products from utilitarian and identity-relevant products.

Since a defining characteristic of performance products and contexts is that they involve activities that require skill, consumers should be motivated to possess necessary skills and to feel competent when performing such activities. Indeed, it is in the nature of humans to strive to be successful in what they are doing (Elliot and Dweck 2005). This heightened need to feel competent in performance contexts should boost consumers' demand for prominent logos on performance (vs. non-performance) products, as we discuss next.

2.1.3 Competence-Based Self-Signaling

Unlike need for status, which is typically attributed to individuals' extrinsic motives to gain external validation, social rewards, and recognition (e.g., Griskevicius, Tybur, and Van den Bergh 2010; Han et al. 2010; Magee and Galinski 2008; Ridgeway and Correll 2006), the need to feel competent is deeply intrinsic to individuals (Elliot and Dweck 2005), as it derives from individuals' fundamental desire for self-fulfillment and mastery (Atkinson and Raynor 1974; Maslow 1943/2013; McClelland 1987). An important way in which the desire for self-fulfillment and mastery manifests is through individuals' need to feel efficacious in tasks that they are performing (Atkinson and Raynor 1974; White 1959). Indeed, individuals have a strong need to feel that they are good at what they are doing—that is, they want to feel that they possess the skills and competencies necessary to perform and complete the task at hand (Dweck and Elliot 1983; Elliot and Dweck 2005). Feeling that one is competent in a given task or activity, in turn, can significantly boost individuals' wellbeing and outcomes (Pajares 1996; Schunk and Pajares 2005). For example, when individuals feel competent, they are more likely to feel engaged in a task, master stressful tasks, and ultimately accomplish their task goals and feel satisfied (Bandura 1982). Therefore, individuals tend to pursue strategies that help them maintain and bolster feelings of competence in tasks at hand (Steele 1988).

Extant research shows that individuals' feelings of task competence can be affected by several factors such as their past performance and experiences, as well as the performance and experiences of similar others. For example, individuals' past success in a task enhances their feelings of competence when they perform a similar task in the future (Bandura 2010; Schunk 1989; Weiner 1986; Wood and Bandura 1989). The accomplishments of similar others in comparable tasks are also assimilated and boost individuals' feelings of competence (Bandura 2010; Festinger 1954; Schunk and Hanson 1989). Notably, consumers' competence feelings may also be affected by certain products that they use. For example, Mochon, Norton, and

Ariely (2012) suggest that self-made products such as IKEA furniture increase consumers' feelings of competence by objectively enabling consumers to take control over the production process. Dahl and Moreau (2007) suggest that using creative products such as recipe books may increase consumers' sense of competence by informing them about how to complete a task and hence by objectively saving them time and effort of learning.

Extending this line of work beyond objective and observable product enhancements and functions, we argue that not only do specific types of experiences and products impact consumers' feelings of competence, but so do different *sizes of brand logos* displayed on performance products. At first glance, in the absence of objective product enhancements, the mere size of a brand logo displayed on a product should not impact consumers' competence feelings. However, we contend that compared to subtle or no logos, prominent logos, by being more visible and identifiable by consumers than subtle or no logos, may create a stronger association in consumers' minds between the given product and the product category. In other words, we contend that prominent logos may amplify the symbolic meaning of products on which they are displayed within their corresponding product category. We argue that the stronger symboling association of products with their respective categories created by prominent logos may strengthen consumers' preferences for prominent logos in performance (vs. non-performance) contexts and categories.

This is because, unique from non-performance products, performance products, by enabling consumers to engage in tasks that require certain skills, may symbolize to consumers the skills required to perform skill-based tasks (e.g., an apron symbolizes the culinary skills required to engage in cooking). Therefore, it is possible that, compared to subtle or no logos, a prominent logo displayed on a performance product (compared to a subtle or no logo), by creating a stronger association between the product and the performance category, may amplify the symbolic association in consumers' minds of the given product with the activity that the product category enables consumers to perform and hence with the skill required to

perform the skill-based activity. As a result, consuming “loud” performance products (i.e., with prominent logos), which more strongly symbolize task-specific skills than quiet performance products (i.e., with subtle or no logos), may enhance consumers’ perception that they possess the skills needed to perform a given task, and, in effect, boost their feelings of competence in the task. These bolstered feelings of competence resulting from consuming loud (vs. quiet) products may, in turn, impact consumers’ product preferences in performance (vs. non-performance) contexts. Since performance contexts heighten consumers’ desire to feel competent because they require consumers to possess certain task-specific skills, we predict that preferences for products with prominent logos may be stronger in performance than in non-performance contexts.

***H₁**: Consumers have a stronger preference for prominent logos displayed on products in performance (vs. non-performance) contexts.*

***H₂**: This effect is mediated by consumers’ stronger desire to feel competent in performance (vs. non-performance) contexts.*

We further identify activity, consumer, and product factors that moderate consumers’ preferences for prominent logos in performance (vs. non-performance) contexts.

2.1.4 Role of Activity Difficulty

We propose that consumers’ preference for prominent logos on performance products depends on the level of ease or difficulty of the activity. Specifically, we predict that consumers’ preference for prominent logos on performance products may be reduced when the performed activity is easy (vs. difficult). This is because difficult activities, by requiring diverse skills and capabilities, strengthen individuals’ desire to feel efficacious to be able to perform these activities successfully (Bandura and Schunk 1981). That is, since difficult activities require more effort, perseverance, and resilience to be mastered, individuals have a

stronger need to believe that they have the skills necessary to complete the activity, and hence they have a stronger need for self-efficacy. Easy activities, in contrast, do not require much effort or skills to be mastered (Bandura and Schunk 1981). Individuals therefore do not have a strong need to find ways to enhance their feelings of competence in easy activities, since they may already feel fully capable to perform such activities successfully (Salomon 1984). We therefore predict that consumers' preference for prominent logos on products in performance contexts may be attenuated when consumers perform easy (vs. difficult) activities, because easy (vs. difficult) activities are less likely to prompt consumers' need to feel competent.

H₃: Consumers' preference for prominent logos on products in performance contexts is attenuated when the performed activity is easy (vs. difficult).

2.1.5 Role of Consumer Motivation

We further propose that consumers' preference for prominent logos on performance products may depend on consumers' level of motivation to improve in the activity. If consumers' preference for prominent brand logos on performance products is driven by their desire to feel competent, as we propose, then we would expect this preference to be weakened when individuals are not motivated to improve in the task. We posit that highly motivated (vs. less motivated) individuals have a higher need to have a positive view of their skills and capabilities, because they more strongly desire to master the activity that they are performing.

Indeed, when individuals are interested in mastering the activity, they are more likely to persist and work toward their pre-determined goals (Bandura 1994; Bandura and Schunk 1981; Elliot and Dweck 2005; McClelland 1987). Hence, motivated individuals who wish to master the activity may have a higher need to feel efficacious in the activity. In contrast, individuals who are less interested in mastering an activity may be less motivated to cultivate a positive view of their skills and capabilities, and hence may have a lower need to feel

efficacious and competent in the activity. Therefore, we predict that consumers' preference for prominent logos in performance contexts will be reduced when consumers are not motivated (vs. motivated) to improve their skills in the performed activity.

H₄: Consumers' preference for prominent logos in performance contexts is attenuated when consumers are less (vs. more) motivated to improve in the performed activity.

2.1.6 Role of Brand Specialization

Finally, if competence-signaling is underlying the effect, as we propose, then the positioning of the brand may also matter. We propose that consumers' preference for prominent logos on performance products may further depend on whether the underlying brand is positioned as specialized versus unspecialized. A specialized brand typically focuses on products that facilitate and cater to a specific activity, whereas an unspecialized brand offers products that can be used across several different activities. For example, if a consumer wishes to perform as a DJ, she may consider a product by Akai, a specialized brand which focuses on music equipment that is specifically used in music production. Alternatively, one may consider a product by Sony, an unspecialized brand that offers not only music equipment, but also electronics products used in activities in other domains such as gaming and home entertainment. We propose that consumers' preference for prominent logos may be attenuated if a brand is not specialized in the performed activity (i.e., if the brand is unspecialized). This is because, if a brand offers task-unrelated products, it may less strongly symbolize task-related skills required to perform the given activity. As a result, it may be harder for consumers to identify the brand's activity focus and core proposition, and hence, the brand's ability to signal its core proposition is weakened (Keller 1993).

Furthermore, if a brand offers products for various (task-related and unrelated) activities, the brand's perceived expertise in any single activity may be diluted and its perceived ability to help consumers successfully perform a given activity may be undermined. Building on these arguments, we predict that, when a brand is unspecialized (vs. specialized), the symbolic association of the brand with task-related skills and the performed activity may be weakened, and a prominent logo's ability to boost consumers' feelings of competence in the activity may be limited. As a result, when the brand is unspecialized (vs. specialized), consumers' preference for prominent logos in performance contexts may be attenuated.

H₅: Consumers' preference for prominent logos on products in performance contexts is attenuated when the brand is unspecialized (vs. specialized).

2.2 Overview of Studies

Ten studies tested our theory using different product categories, consumption contexts, experimental designs, and samples. As an initial test of our theory, we conducted a pilot study examining the link between product price and brand prominence observed in performance product contexts in the field. Whereas prior studies reported that in non-performance contexts, prominent logos are linked to lower prices (e.g., Berger and Ward 2010; Han et al. 2010), we found that in performance contexts, prominent logos are actually linked to *higher* prices. This suggests that in performance contexts, prominent logos may offer higher value to consumers than subtle logos. Studies 1A and 1B tested our focal hypothesis (H₁) in a controlled setting by examining the size of brand logos that consumers self-generated (drew, 1A) and chose (1B). Study 2 examined the mediating role of consumers' desire to feel competent (H₂). Studies 3A, 3B, and a follow-up study provided converging evidence for the primary role of competence *self*-signaling in driving the effect by showing that the effect holds across private and public consumption settings and regardless of consumers' baseline level of competence or

status. Finally, studies 4, 5, and 6 tested the boundary conditions (S4: activity difficulty, H₃; S5: consumers' improvement motivation, H₄; S6: brand specialization, H₅). Across studies, we report all conditions, measures, and exclusions.

2.2.1 *Pilot Study*

As an initial test of our theory, we examined the relationship between product price and brand logo prominence within performance product categories in the field. Previous research on the relationship between price and logo prominence in non-performance product categories (e.g., luxury apparel or accessories) found that more expensive products typically display subtle (vs. prominent) logos (Berger and Ward 2010; Han et al. 2010).² This pattern of results is consistent with the social signaling account of brand logo size preferences: consumers are willing to spend more money on products with subtle logos to differentiate themselves from mainstream or lower-status consumers.

In performance contexts, however, we expected that prominent logos may not signal lower social status, but may instead signal higher competence. This pattern should, in turn, translate to a *positive* relationship between logo prominence and price within performance product categories. That is, we expected prominent (vs. subtle) logos to be displayed on more expensive products within performance product categories. Indeed, it is reasonable to expect that consumers would be willing to pay more for performance products if these products would make them feel competent in the performed skill-based activity.

To test this proposition, we focused on two performance product categories that are used in activities that require specific skills—cycling helmets and golf bags. A pre-test (N =

² Han et al. (2010) showed a negative linear relationship between price and logo prominence for luxury products, namely the higher the price, the more subtle the logo. Berger and Ward (2010) found an inverse u-shaped relationship between logo prominence and price, namely that products with very low and very high prices display a more subtle logo, whereas products in-between display more prominent logos. Integrating these results, it appears that high-end products tend not to display prominent logos.

50, $M_{\text{age}} = 38.14$, 52% female), in which participants assessed one of the two product categories (randomly-assigned) on the performance scale we developed, confirmed that both product categories were performance-related (cycling helmets: $M = 5.25$, t -test comparison to scale mid-point ($df = 24$) = 7.35, $p < .001$; golf bags: $M = 5.11$, $t(24) = 7.79$, $p < .001$).

Design and Procedure

In line with typical procedures used in prior studies (Berger and Ward 2010; Han et al. 2010), we sampled all cycling helmets launched by four major biking brands (POC, Alpina, Uvex, B'Twin) and all golf bags launched by five major golf brands (Titleist, Srixon, Ogio, Ping, Inesis) during one full season. We examined high-, medium- and low-tier brands in each category to capture the variation in offerings within the category (Appendix A), and we collected data from official brand websites which listed the complete brand product line and price information. This resulted in a set of 108 helmets (price range: €4.99 - €999.95, $M = €147.29$, $SD = 157.24$) and 61 golf bags (price range: €41 - €389, $M = €182.23$, $SD = 64.34$).

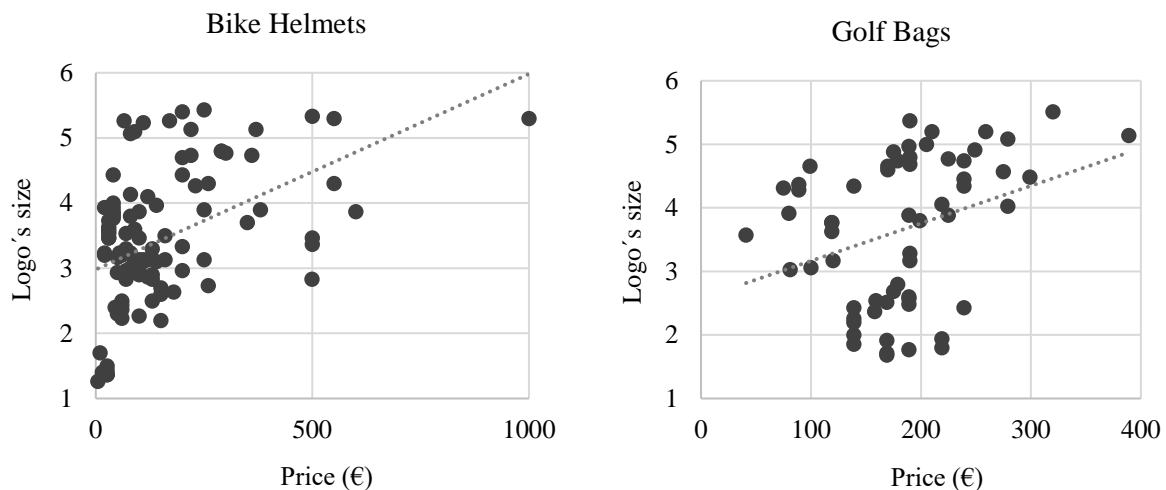
We asked 32 independent coders to evaluate the prominence of the logo on bike helmets or golf bags (1 = no logo, 6 = very big logo; bike helmets: $M = 5.43$, $SD = 1.03$; golf bags: $M = 5.51$, $SD = 1.16$). Two coders failed to complete the task and therefore did not provide usable data.

Results and Discussion

An OLS regression analysis revealed a significant positive relationship between product price and the ratings of logo size (bike helmets: $b = .003$, $SE = .000$, $p < .001$, $R^2 = .46$; golf bags: $b = .005$, $SE = .002$, $p = .010$, $R^2 = .46$; see Figure 1). These results differ from previous studies conducted in non-performance product categories and geared toward social-signaling goals (whereby exclusivity is part of brand perceptions and positioning), which found that very few high-priced products display prominent logos (Berger and Ward 2010;

Han et al. 2010). Instead, our findings indicate that in performance categories geared toward consumers' self-signaling goals, the price-logo relationship reverses: the higher the price of a performance product, the more prominent the brand logo.

Figure 1 - Relationship Between Product Price and Logo Size in Performance Categories



Notes: Black dots indicate data points; dashed lines are regression lines (trend lines).

These initial results suggest that on performance products, prominent logos may offer consumers additional value which would justify paying a higher price. In the next studies, we test our theory in controlled settings: we examine the sizes of logos that consumers prefer (self-generate and choose) within performance (vs. non-performance) contexts, test the psychological process behind this phenomenon, and explore the relevant boundary conditions.

2.2.2 Study 1A: Self-Generated Logo Prominence

Study 1A sought to examine consumers' preference for prominent logos on performance (vs. non-performance) products. To ensure internal validity, we held the actual product constant across conditions, but we manipulated (between-participants) whether the product was described as being used in a performance or non-performance context. In this study and all subsequent studies, we verified that the product used in the performance (vs. non-performance) context scored higher (vs. lower) on the performance scale which we

develop in Chapter 3.³ To ensure the generalizability of the results, we tested the proposed effect in three distinct product categories (manipulated between-participants). Participants read that they were considering buying a backpack, a t-shirt, or gloves to use either in a performance or a non-performance context, and they were asked to draw how they would want the brand logo to appear on the product. Consistent with hypothesis 1, we predicted that consumers would prefer, and therefore draw, more prominent logos on products used in a performance context compared to a non-performance context.

Participants and Design

Two hundred and forty students ($M_{\text{age}} = 21.23$, 28% female) participated in a 2 (context: performance vs. non-performance) \times 3 (product replicate: backpack, t-shirt, gloves) between-participants design experiment.

Procedure

Participants were invited to a lab and were asked to co-design a backpack, a t-shirt, or gloves. They were given a sheet of paper with a plain unbranded picture of the focal product (constant across conditions; Appendix C). Participants were told that they would be using the product in a performance context (a backpack for playing tennis, a t-shirt for mountain-biking, gloves for skiing) or a non-performance context (a backpack for carrying everyday necessities, a t-shirt for going out, gloves for wearing during the winter season). A pre-test confirmed that products in the performance (vs. non-performance) condition were rated

³ In our studies, we consistently varied the performance versus non-performance nature of the product or consumption context. While it is possible the stimuli that we featured as “non-performance” in some of our studies necessitated some basic skills and hence potentially had some performance aspects, the skill requirements in those contexts were typically minimal and were significantly lower than skill requirements in what we used as “performance” contexts. For example, while biking in a city (non-performance context in study 3B) requires a basic ability to ride a bike, the skill requirement in that context is significantly lower than the skill requirement in the context of a cycling race (performance context in study 3B). (Please note that performance contexts featured in most of our studies were also not competitive.) Importantly, the product and context descriptions that we utilized in non-performance (vs. performance) conditions consistently scored significantly lower in pre-tests on the performance scale that we had developed, which facilitated the key comparison of logo size preferences between performance and non-performance conditions across studies. See Chapter 3 for scale details and appendix B for stimuli pre-test details and results.

significantly higher on the scale of performance we had developed ($M_{\text{Perf}} = 5.15$ vs. $M_{\text{NonPerf}} = 4.33$; $t(301) = 4.94$, $p < .001$) (see Appendix B for the results for each replicate).

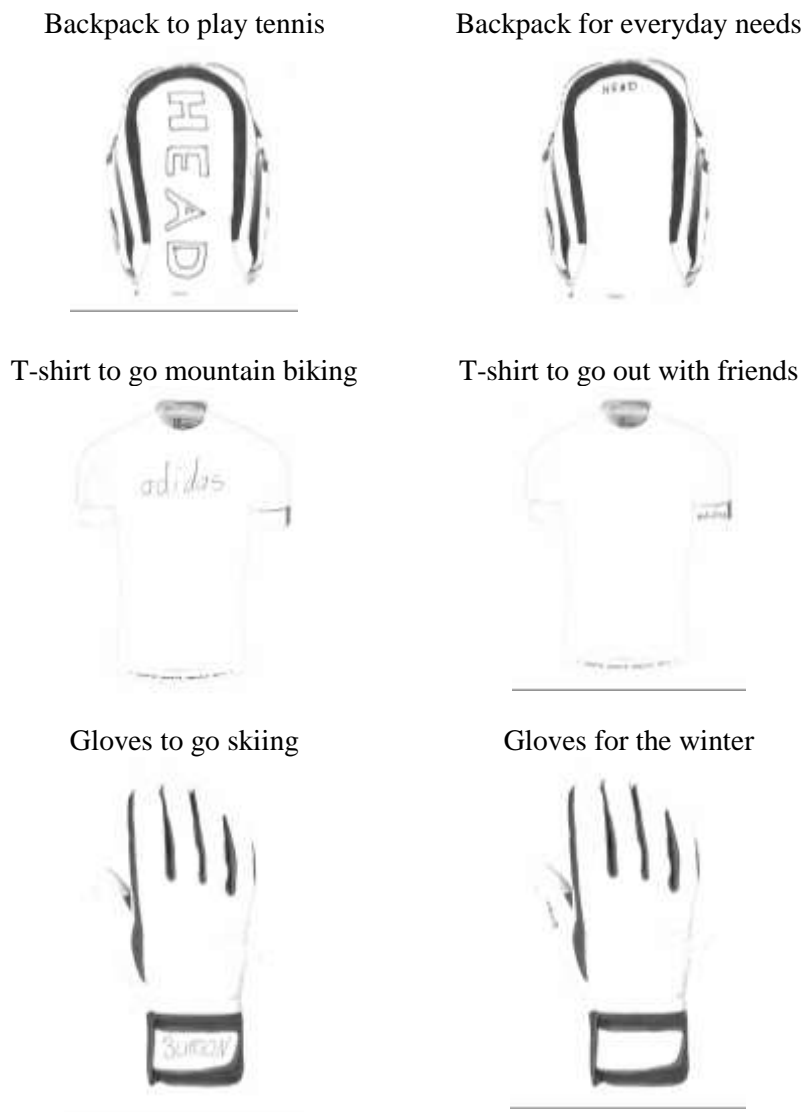
Regardless of which product category participants were working with, they could draw the logo of one of four brands on a black-and white logo-less outline of the product provided on a 6 × 8 in. white paper. In each category, we used four well-known brands within the category (e.g., Head, Nike, Adidas, Puma in the backpack category). The logos of these brands were displayed in identical size on the paper survey (see Appendix C). Specifically, participants were told they could draw the logo on any part of the product, in any size, and in any orientation that they wanted. After the study ended, we measured the objective size of the drawn logo with a ruler by computing the surface area (length × width) occupied by the logo on the product, which served as our dependent variable ($M = .41 \text{ in}^2$, $SD = .60 \text{ in}^2$).

Results and Discussion

We report the results of the aggregated areas of all the drawn logos. An ANOVA with performance (performance- vs. non-performance) and product replicate (backpack, t-shirt, gloves) as fixed factors revealed the predicted effect of performance. Participants drew significantly larger logos on average in the performance than in the non-performance condition ($M_{\text{Perf}} = .52 \text{ in}^2$ vs. $M_{\text{NonPerf}} = .31 \text{ in}^2$; $F(1, 234) = 7.79$, $p = .006$, $\eta_p^2 = .032$). (Seventeen participants drew something other than a brand logo; the results did not change when these participants were excluded. Nineteen participants drew more than one logo of the same brand; the results did not change when we analyzed the biggest logo that each participant drew.) The main effect of the product replicate ($F(2, 234) = .99$, $p = .373$, $\eta_p^2 = .008$) was not significant, nor did it interact with the performance context ($F(2, 234) = .31$, $p = .738$, $\eta_p^2 = .003$). Hence, the effect of the performance context was consistent across categories and replicates: consumers preferred more prominent logos on products when

products were used in performance rather than non-performance contexts (see Figure 2 for examples of logos drawn by participants).

Figure 2 - Examples of Logos Drawn by Participants in Study 1A



2.2.3 Study 1B: Preferred Logo Prominence

Study 1B sought to replicate the results of study 1A with a different experimental paradigm. Similar to Berger and Ward (2010), we manipulated the extent to which the product (rather than the context) was performance-related. We tested whether consumers would have a stronger preference for products with prominent (vs. subtle) logos on performance rather than non-performance products.

Participants and Design

One hundred and forty-two consumers ($M_{\text{age}} = 37.42$, 38% females) from an online panel (MTurk) participated in an experiment with a 2 (product: performance vs. non-performance) \times 4 (replicate: O'Neill, Rossignol, Stanley, Scott) within-participants design.

Procedure

Participants were shown the pictures of eight pairs of products—two pairs from each of four brands (O'Neill, Rossignol, Stanley, Scott). For each brand, one pair of products represented a performance category (a surf vest by O'Neill, a ski helmet by Rossignol, a toolbox by Stanley, a mountain bike by Scott) and the other pair represented a non-performance category (a t-shirt by O'Neill, a hat by Rossignol, a cooler by Stanley, a city bike by Scott). Thus, participants saw a total of eight products: four from performance categories and four from non-performance categories. A pre-test confirmed that product stimuli we used as performance (vs. non-performance) products were more performance-related on the scale we had developed ($M_{\text{Perf}} = 5.46$ vs. $M_{\text{NonPerf}} = 4.25$; $t(401) = 8.63$, $p < .001$).

In the main study, participants could, for each of the eight products they evaluated, choose between two options: one with a prominent logo and one with no logo (see Appendix C for stimuli). This logo prominence choice paradigm, which we also used in subsequent studies, allowed us to reproduce what actually happens in the marketplace, where consumers are faced with a choice among different options (Meyvis and Van Osselaer 2018). To increase realism, we slightly varied the design of each product option (unrelated to brand logo) and counterbalanced the product design that was matched with each logo option (that is, half of the participants chose between a product with a prominent logo in design A versus a product with no logo in design B, and the other half chose between a product with a prominent logo in design B versus a product with no logo in design A). Product design had no significant effects and is therefore not discussed further.

Participants read that they were looking to purchase a product in each category and they indicated their preference between the prominent-logo versus the no-logo product option in each category using a 5-point scale (1 = no-logo option, 5 = prominent-logo option).

Results and Discussion

A 2 (performance vs. non-performance) \times 4 (brand replicate) repeated-measures ANOVA revealed that participants preferred products with a prominent logo more strongly on performance rather than non-performance products ($M_{\text{Perf}} = 3.46$ vs. $M_{\text{NonPerf}} = 3.06$; $F(1, 141) = 34.40$, $p < .001$, $\eta_p^2 = .196$). The performance \times replicate interaction was marginally significant ($F(3, 423) = 2.55$, $p = .055$, $\eta_p^2 = .018$) indicating that there was some variation in the strength of the effect across product categories (Scott: $M_{\text{Perf}} = 3.51$ vs. $M_{\text{NonPerf}} = 3.29$; $p = .028$; Rossignol: $M_{\text{Perf}} = 3.35$ vs. $M_{\text{NonPerf}} = 2.92$; $p = .002$; O'Neill: $M_{\text{Perf}} = 3.16$ vs. $M_{\text{NonPerf}} = 2.86$; $p = .004$; Stanley: $M_{\text{Perf}} = 3.80$ vs. $M_{\text{NonPerf}} = 3.18$; $p < .001$).

Study 1B provided further support for hypothesis 1 by showing that consumers have a stronger preference for products with prominent logos when the underlying product category scores high rather than low on the performance dimension. Together, the results of studies 1A and 1B show that in performance product categories and contexts, prominent logos are not only preferred over small logos, but they are also preferred over no logos.

2.2.4 Study 2: Desire to Feel Competent

Study 2 sought to examine the psychological process underlying consumers' preference for prominent logos on performance products found in studies 1A and 1B. Consistent with hypothesis 2, we predicted that consumers would prefer prominent over subtle (and no) logos in performance product categories and contexts because prominent logos boost consumers' feelings of competence in the focal skilled-based activity.

Participants and Design

Two hundred and forty-four consumers ($M_{\text{age}} = 32.92$, 43% female) from an online panel (MTurk) participated in the experiment. As in study 1A, we held the actual product constant across conditions, but varied whether the product was described as being used in a performance or a non-performance context.

Procedure

Participants read that they were considering buying headphones from the fictitious brand Tooler to use in a performance context (to perform as a DJ) or a non-performance context (to listen to music, manipulated between-participants). To eliminate any bias related to consumers' inherent liking of existing brands, we used a fictitious brand in this study. A pre-test confirmed that performing as a DJ was perceived to be significantly more performance-related than listening to music on the scale we had developed ($M_{\text{Perf}} = 5.41$ vs. $M_{\text{NonPerf}} = 4.44$; $t(98) = 4.09$, $p < .001$).

As the dependent measure, we asked participants to indicate their preference for logo size displayed on the headphones using two items: "Would you prefer to have a small or a big logo of the brand Tooler on the headphones?" (1 = "I would prefer a small logo", 7 = "I would prefer a big logo") and "Would you prefer to have a prominent or non-prominent logo of the brand Tooler on the headphones?" (1 = "I would prefer a non-prominent logo", 7 = "I would prefer a very prominent logo"; $M = 3.11$, $SD = 1.80$, $r = 0.77$, $p < .001$). We used a direct question about the preferred prominence of the logo, rather than the graphical size of the logo in this study, because the brand was fictitious and showing a picture of a logo would be less relatable to participants than directly asking them about logo size.

To examine the psychological process (i.e., individuals' desire to consume a product that makes them feel competent), we measured the perceived importance of feeling competent ("How important would it be for you to use headphones that make you feel competent in this

situation”; 1 = “not important at all”, 7 = “very important”; $M = 4.70$, $SD = 1.95$). We used this measure of importance as a mediator in our analysis: if consumers want to feel competent in a certain (performance vs. non-performance) context, then they should be more likely to purchase a product that they expect to increase their competence feelings.

Results and Discussion

An ANOVA on logo size preference with context (performance vs. non-performance) as a fixed factor revealed that participants had a stronger preference for a prominent logo in the performance (vs. non-performance) context ($M_{\text{Perf}} = 3.65$ vs. $M_{\text{NonPerf}} = 2.55$; $F(1, 242) = 25.15$, $p < .001$, $\eta_p^2 = .094$). This result corroborates the findings of studies 1A and 1B in a different setting (headphones for music). A mediation analysis (model 4 with 10,000 bootstrap samples and 95% bias-corrected confidence intervals; Hayes 2013) revealed a significant indirect effect of the performance (vs. non-performance) context on preferences for a prominent logo through the perceived importance of feeling competent ($b = .223$, $SE = .053$, 95% $CI = [.131, .342]$). Hence, participants preferred a prominent logo more strongly in the performance (vs. non-performance) context because in that context they had a stronger desire to feel competent.

Study 2 replicated the focal effect (hypothesis 1) using a hypothetical brand (rather than existing brands used in studies 1A and 1B), which minimized the potential role played by participants’ existing attitudes toward known brands. Importantly, study 2 documented that competence perceptions drive the effect of product performance on logo size preference. These findings represent a novel departure from the existing brand prominence literature which documented that prominent logos may send a negative signal about consumers’ status to others (e.g., Han et al. 2010).

It is worthwhile to consider that some participants in study 2 may have associated the performance context (performing as a DJ) with a more public setting than the non-

performance context (listening to music). In studies 3A and 3B, we examine the role of private versus public consumption and of self- versus social-signaling. We thereby further delineate the distinction of our research from prior work which focused on the negative impact of prominent logos in product categories that are symbolically consumed in public.

2.2.5 Study 3A: Public Versus Private Consumption

The brand prominence literature distinguishes between public and private consumption settings and highlights the role of public settings in strengthening brand logos' signaling value to others (Berger and Ward 2010; Han et al. 2010; Wilcox et al. 2009). In contrast, we propose that in performance contexts, consumers prefer certain logos because they want to feel competent beyond merely trying to signal status to others. The goal of study 3A was therefore to examine whether the hypothesized effect varies as a function of private versus public consumption and, in effect, whether the positive signaling mechanism that drives consumers' preference for prominent logos in performance contexts stems from consumers' desire to signal competence to *self* or their desire to signal status or competence to *others*. If consumers' preference for prominent logos in performance contexts is driven by their desire to signal competence to themselves, as we propose, then the presence of other individuals in the consumption setting should *not* play an important role as the target of the competence signal, oneself, is present in both private and public settings. We thus expect that in performance contexts, consumers' preference for prominent (vs. subtle) logos would be strong irrespective of whether they consume a performance product in private (where consumers can only signal to self) or public (where consumers can signal to self and others).

Participants and Design

Three hundred and four consumers ($M_{\text{age}} = 34.70$, 57% female) from an online panel (MTurk) participated in the experiment that had a three-cell between-participants design (performance context: private performance vs. public performance vs. non-performance). Once again, to minimize the role played by participants' inherent attitudes toward existing brands, we used a fictitious brand in this study.

Procedure

Participants read that they were considering buying gloves from the fictitious brand Tetra for a specific purpose. In the private performance condition, the purpose was to practice skiing alone in the mountains; in the public performance condition, it was to practice skiing with many other skiers in the mountains; in the non-performance condition, it was to relax and enjoy the fresh air in a ski area in the mountains. A pre-test confirmed that gloves were perceived to be more performance-related in the performance conditions (i.e., practice skiing in the mountains) than in the non-performance condition (i.e., relax and enjoy fresh air in the mountains; respectively, $M_{\text{Perf}} = 5.59$ vs. $M_{\text{NonPerf}} = 4.52$; $t(99) = 4.12$, $p < .001$). After reading the scenario, participants saw the pictures of two pairs of Tetra gloves that differed in logo size (Appendix C). Participants indicated their purchase preference between the two pairs of gloves (1 = gloves with a subtle logo, 5 = gloves with a prominent logo).

Results and Discussion

An ANOVA on product preference with context (private performance vs. public performance vs. non-performance) as a fixed factor revealed a significant effect of context ($F(1, 302) = 11.97$, $p = .001$, $\eta_p^2 = .044$). Compared to the non-performance condition ($M_{\text{NonPerf}} = 2.40$), participants preferred a more prominent logo in both the private performance (skiing alone) and the public performance (skiing with others) conditions

($M_{\text{PrivPerf}} = 3.23$, $F(1, 203) = 14.58$, $p < .001$, $\eta_p^2 = .067$; $M_{\text{PubPerf}} = 2.93$, $F(1, 199) = 5.32$, $p = .022$, $\eta_p^2 = .026$). Though preferences for a prominent logo were directionally higher in the private performance than in the public performance condition, this difference was not statistically significant ($F(1, 200) = 1.64$, $p = .184$, $\eta_p^2 = .008$).

The results of study 3A replicated the pattern observed in our prior studies that consumers have a stronger preference for prominent over subtle logos in performance contexts. Notably, if the logo prominence effect was primarily driven by consumers' social signaling motives—signaling status or competence *to others*—we would have observed a stronger preference for gloves with a prominent logo in the public performance compared to the private performance condition. The finding that participants preferred a prominent (vs. subtle) logo in the private performance condition as much, and even directionally more, than they did in the public performance condition, suggests that the focal effect cannot be attributed to the social signaling account—that is, to consumers' desire to signal status or competence to others. Study 3B builds on these findings to directly compare the mediating roles of self-signaling and social signaling.

2.2.6 Study 3B: Mediating Roles of Signaling to Self and Others

Study 3B sought to test whether the hypothesized effect is mediated by consumers' desire to signal competence to self or others.

Participants and Design

Two hundred and eighty-two students ($M_{\text{age}} = 20.15$, 40% female) participated in the experiment that had two between-participants conditions (context: performance- vs. non-performance).

Procedure

Participants read that they were considering buying a helmet for either a bike race (performance) or for casually biking in the city (non-performance). A pre-test confirmed that the helmet was perceived to be significantly more performance-related in the performance than in the non-performance condition (same scale: respectively, $M_{\text{Perf}} = 5.45$ vs. $M_{\text{NonPerf}} = 4.95$; $t(98) = 2.20$, $p = .030$).

Participants were shown the pictures of two helmets from the biking brand Scott: one with a prominent logo and one with a subtle logo (Appendix C). Participants were asked to indicate which option they would choose to buy in the given context using a dichotomous scale. To test whether the effect was driven by self- or social signaling, participants also indicated the importance of signaling competence to self and signaling competence to others in the given context (respectively, “It would be important to me to choose a helmet that makes me feel like a good cyclist” and “It would be important for me to choose a helmet that gives other people the impression that I am a good at cycling”; 1 = “strongly disagree”, 5 = “strongly agree”).

Results and Discussion

A logistic regression with product choice as the dependent variable revealed that participants had a stronger preference for the helmet with a prominent logo in the performance (vs. non-performance) condition (50% vs. 35%; $b = .619$, $SE = .244$, $\chi^2 = 6.43$, $p = .011$). A mediation model (model 4) with self-signaling and social signaling as competing mediators revealed that the observed effect of the performance context on logo size choice was mediated by the perceived importance of signaling competence to self, rather than signaling to others (self-signaling: $b = .299$, $SE = .159$, 95% CI = [.040, .659]; social signaling: $b = .115$, $SE = .116$, 95% CI = [-.107, .367]).

Together, studies 3A and 3B provided corroborating evidence for the primary role that signaling competence to self (the focus of the present research), rather than signaling to others (the focus of prior research), plays in driving consumers' preferences for prominent logos within performance contexts and categories.

Follow-up Study

To further distinguish this unique motivation and prediction from prior research, we conducted a follow-up study ($N = 200$) in which we examined how consumers' level of status or expertise in a skill-based task (i.e., level of proficiency in sailing among members of an online sailing forum and local sailing club) may be related to preferences for prominent logos in performance contexts (i.e., sailing; see Appendix D for study details and results). Prior research focused on social signaling would predict that prominent logos should appeal more strongly to consumers with low (vs. high) levels of status or expertise in the activity because these consumers have a stronger need to socially signal their belonging to an aspirational group. In contrast, the results of our follow-up study revealed that consumers' preference for prominent logos in performance (vs. non-performance) contexts was not moderated by consumers' baseline level of status or expertise in the skill-based activity (main effect of performance: $M_{\text{Perf}} = 2.79$ vs. $M_{\text{NonPerf}} = 2.19$, $p = .010$, $\eta_p^2 = 0.192$; moderation by expertise (model 1 in Process): $b = -.062$, $SE = .053$, 95% $CI = [-.167, .044]$).

This is consistent with our study 3A-B results showing that the benefit of prominent logos in performance contexts goes beyond social signaling and is mainly rooted in competence-focused self-signaling—a need that both consumers with limited and extensive levels of expertise share when performing skill-based activities. Indeed, while there may be reasons (e.g., desire to boost low self-esteem) for why the need to feel competent may sometimes be stronger among consumers with limited expertise in the activity (e.g., Gao, Wheeler, and Shiv 2009), there may be other reasons (e.g., the desire to assert and reap pride

from one's expertise) for why the desire to feel competent could sometimes be stronger among individuals with high expertise in the activity (e.g., Kim, Park, and Dubois 2018). To that end, the non-significant moderating effect of consumers' expertise or status found here further favored the self-signaling over the social signaling account of logo size preferences.

Studies 4-6 examined the theoretically relevant boundary conditions.

2.2.7 Study 4: Role of Activity Difficulty

Study 4 sought to test the first boundary condition of the focal effect. Since performance contexts require skill and thereby heighten consumers' desire to feel competent, we predicted that preferences for prominent logos in performance contexts would be reduced when the activity for which a product is used was easy rather than difficult (H_3). This is because when an activity is easy (and therefore requires limited skill), consumers should not have a particularly strong desire to feel competent.

Participants and Design

One hundred and forty-seven students ($M_{age} = 20.50$, 31% female) participated in an experiment that had three between-participants conditions (context: difficult performance vs. easy performance vs. non-performance).

Procedure

Participants read that they were going to the mountains in a renowned place for mountaineering to engage in one of three activities: to do demanding mountaineering on difficult routes in the difficult performance condition; to do basic mountaineering on easy routes in the easy performance condition; or to enjoy the view in the mountains in the non-performance condition. Participants read that they were considering buying a t-shirt for the

occasion. A pre-test confirmed that a t-shirt used for mountaineering was perceived to be more performance-related than one used to enjoy the view in the mountains (same scale: respectively, $M_{\text{Perf}} = 5.45$ vs. $M_{\text{NonPerf}} = 4.95$; $t(98) = 3.53$, $p = .001$). An additional pre-test confirmed that both the difficult and easy mountaineering contexts were perceived to be significantly more performance-related than the enjoying the view context ($M_{\text{DiffPerf}} = 4.57$ vs. $M_{\text{NonPerf}} = 3.18$, $t(99) = 1.40$, $p < .001$; $M_{\text{EasyPerf}} = 3.85$ vs. $M_{\text{NonPerf}} = 3.18$, $t(99) = .67$, $p = .019$; 1 = “not performance-related at all” to 5 = “definitely performance-related”), and that demanding mountaineering on difficult routes was perceived to be more difficult than basic mountaineering on easy routes ($M_{\text{DiffPerf}} = 4.04$ vs. $M_{\text{EasyPerf}} = 3.03$; $F(1, 66) = 12.47$, $p = .001$; 1 = “very easy/very trivial”, 5 = “very difficult/very demanding”).

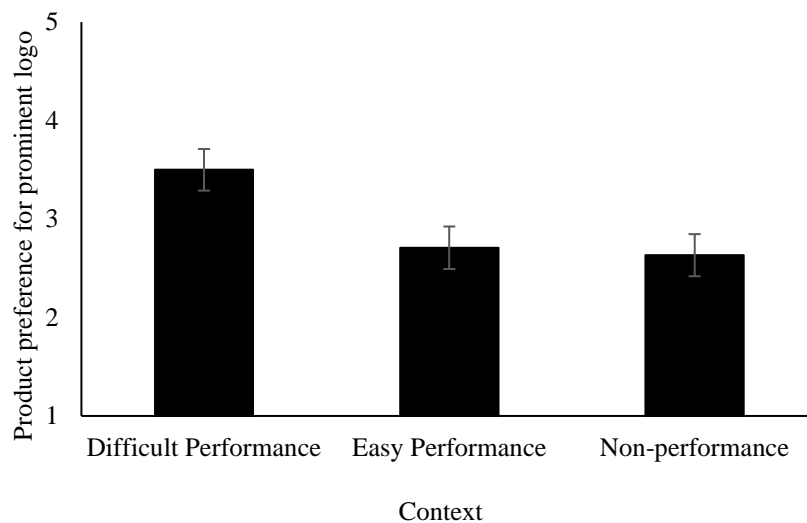
Participants read that they were considering buying a t-shirt from the fictitious outdoor brand Tetra. Once again, to eliminate any bias related to consumers’ inherent liking of existing brands, we used a fictitious brand in this study. Participants saw two options of Tetra t-shirts—one with a prominent logo and one with a subtle logo—and they indicated which option they would prefer to buy in the given context (1 = a t-shirt with a subtle logo, 5 = a t-shirt with a prominent logo). To test our proposed psychological account, participants also indicated how important it would be for them to feel competent in the t-shirt (1 = “not important at all”, 5 = “very important”).

Results and Discussion

An ANOVA predicting t-shirt preferences with activity as a fixed factor revealed a significant effect of context ($F(1, 145) = 10.23$, $p = .002$, $\eta_p^2 = .066$). As predicted in hypothesis 3 and shown in Figure 3, participants had a significantly stronger preference for the t-shirt with the prominent logo in the difficult performance condition than in the easy performance condition and than in the non-performance condition ($M_{\text{DiffPerf}} = 3.50$ vs. $M_{\text{EasyPerf}} = 2.71$, $F(1, 96) = 7.00$, $p = .010$, $\eta_p^2 = .068$; $M_{\text{DiffPerf}} = 3.50$ vs. $M_{\text{NonPerf}} = 2.63$, $F(1,$

97) = 8.69, $p = .004$, $\eta_p^2 = .082$). There was no significant difference between the easy performance and non-performance conditions ($F(1, 95) = .06$, $p = .809$, $\eta_p^2 = .001$), as we predicted. These results corroborate our proposition that the level of difficulty of the activity qualifies our main effect: the preference for prominent logos on performance products is reduced when the performed activity is easy and hence requires little skill.

Figure 3 - Effect of Activity Difficulty on Preferences for Prominent Logos in Performance Contexts



Since we did not predict or observe a significant difference between the easy performance and the non-performance conditions, we aggregated the data from these two conditions and examined whether the importance of feeling competent could explain participants' stronger interest in a prominent logo in the difficult performance condition compared to the easy performance and the non-performance conditions. The results revealed that the effect of activity difficulty on logo prominence preference was mediated by the desire to feel competent (model 4: $b = .088$, $SE = .047$, 95% $CI = [.014, .209]$). The results were consistent when we conducted the mediation analysis separately contrasting the difficult performance condition to the easy performance condition ($b = .095$, $SE = .053$, 95% $CI = [.016, .233]$) and the difficult performance to the non-performance condition ($b = .127$, $SE = .064$, 95% $CI = [.029, .288]$). These findings further corroborated our proposed process.

Study 4 uncovered the first boundary condition of the effect, and it provided further evidence for feelings of competence as the underlying psychological mechanism. The findings suggest that prominent logos on performance products do not boost feelings of competence when the performed activity is easy and hence does not require a high level of skill. Study 5 builds on these findings and examines the second boundary condition of the effect—consumers' motivation to improve in the performed skill-based activity.

2.2.8 Study 5: Role of Consumers' Improvement Motivation

Study 5 sought to test the second boundary condition of the focal effect pertaining to consumers' motivation to improve in the performed activity. If consumers have a low (vs. high) motivation to improve their skills in the performed activity, then feeling competent in the activity should be less important to them and hence their stronger preference for prominent over subtle logos on performance (vs. non-performance) products should be reduced (H₄). Furthermore, in study 5, we sought to generalize the focal effect to a different performance context in which possessing a specific skill is important—cooking.

Participants and Design

Two hundred and forty-three participants ($M_{\text{age}} = 35.6$, 65% female) from an online panel (MTurk) completed a study that had three between-participants conditions (improvement motivation in the performance context: high vs. low vs. control).

Procedure

Participants imagined that they were taking a cooking class. In the high improvement motivation condition, participants read that after taking the cooking class they became very interested in cooking at a high level and were extremely motivated to improve their cooking

skills. In the low improvement motivation condition, participants read that after taking the cooking class they were not particularly interested in cooking at a high level and were not motivated to improve their cooking skills. In the control condition, participants did not receive any information regarding their motivation to increase their cooking skills. Participants were next asked to consider buying an apron from the (fictitious) cooking brand Siggi. They saw pictures of two options of Siggi aprons—one with a prominent logo and one with a subtle logo. As in studies 1B and 3B, to ensure realism, we slightly varied the design of the two options (unrelated to brand logo) and we counterbalanced which design was matched with which logo option. Design once again had no effect in the analysis and is therefore not discussed further.

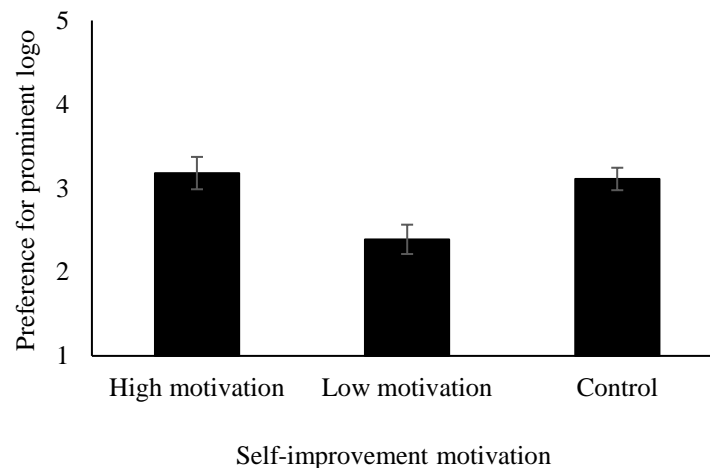
As the dependent variable, participants were asked to indicate which apron they would prefer to buy (1 = an apron with a subtle logo, 5 = an apron with a prominent logo). As a process measure, we asked participants to indicate how important it was for them to feel competent cooking in the apron (1 = “not important at all”, 5 = “very important”).

Main Results

An ANOVA on product preference with improvement motivation (high vs. low vs. control) in the performance context as a fixed factor revealed a significant effect of motivation ($F(2, 240) = 5.58, p = .004, \eta_p^2 = .044$). Consistent with our prediction (H_4), participants had a stronger preference for the apron with a prominent (vs. subtle) logo in the high improvement motivation condition than in the low improvement motivation condition ($M_{\text{HighMotiv}} = 3.18$ vs. $M_{\text{LowMotiv}} = 2.39; F(1, 160) = 9.29, p = .003, \eta_p^2 = .055$). As shown in Figure 4, participants’ preference for a prominent logo was also stronger in the performance control condition where no motivational cues were provided, than in the low improvement motivation condition ($M_{\text{Control}} = 3.11$ vs. $M_{\text{LowMotiv}} = 2.39; F(1, 159) = 7.92, p = .006, \eta_p^2 = .048$). There was no significant difference between the high improvement motivation and the

control conditions ($F(1, 161) = .07, p = .791, \eta_p^2 < .001$). This finding is consistent with the results of our prior studies in which we did not explicitly manipulate participants' improvement motivation, and it illustrates that in performance contexts, consumers are generally motivated to improve.

Figure 4 - Effect of Improvement Motivation on Preferences for Prominent Logos in Performance Contexts



Similar to study 4, since we did not predict nor find a significant difference between the high improvement motivation and the control conditions, we collapsed these two conditions and compared whether consumers' stronger desire to feel competent drove their stronger preference for a prominent logo in these two conditions than in the low improvement motivation condition. Consistent with hypothesis 4, the results revealed that feelings of competence mediated the effect of the improvement motivation on preferences for a prominent logo in the performance (high motivation and control vs. low motivation) context (model 4: $b = .223, SE = .052, 95\% CI = [.130, .342]$). The results were consistent when we conducted the mediation analysis comparing the high motivation and the control conditions separately to the low motivation condition (respectively, $b = .323, SE = .076, 95\% CI = [.194, .496]$ and $b = .174, SE = .062, 95\% CI = [.070, .340]$).

These findings underscore the key role that consumers' motivation to improve plays in performance contexts and in consumers' preference for prominent over subtle logos in such

contexts. The findings indicate that in performance contexts people are generally motivated to do well and improve (and they therefore prefer prominent over subtle logos), unless they are prompted to think otherwise. The results thereby provided further evidence for the central role that consumers' desire to feel competent in performance contexts plays in driving their preferences for prominent logos. Study 6 examines the final boundary condition of the proposed effect—a brand's specialization in the performed activity.

2.2.9 Study 6: Role of Brand Specialization

Study 6 sought to examine whether brands' degree of specialization in the performed activity qualifies consumers' preferences for prominent logos in performance contexts. Compared to unspecialized brands, specialized brands are more strongly symbolically associated with the specific skills required to perform an activity, and thus should make consumers feel competent performing the activity. We therefore predict that consumers' preferences for prominent logos on performance products should be reduced if the brand does not specialize in the performed activity—that is, if the brand is unspecialized (H₅).

Participants and Design

Three hundred and twenty-two participants ($M_{\text{age}} = 33.97$, 62% female) from an online panel (MTurk) completed a study that used a 2 (context: performance- vs. non-performance) \times 2 (brand: specialized vs. unspecialized) between-participants design.

Procedure

As in study 2, participants read that they were considering buying headphones from the (fictitious) brand Tooler either to perform as a DJ (performance context) or to listen to music (non-performance context). Since performing as a DJ is a behavior that often occurs in public, and our study 3A results did not reveal differences between public and private

consumption contexts, we set both the performance and non-performance conditions in a public setting. A pre-test confirmed that performing as a DJ was perceived to be significantly more performance-related than listening to music (same scale: $M_{\text{Perf}} = 5.41$ vs. $M_{\text{NonPerf}} = 4.44$; $t(98) = 4.09, p < .001$).

To manipulate brand specialization, participants either read that Tooler was a specialized brand in music gear that produced music equipment only, or that it was an unspecialized brand that produced a variety of electronics products for many purposes. To control for the potential role of quality perceptions, we kept product quality constant across conditions by informing participants that the headphones received a score of 92 out of 100 from Consumer Reports.

Participants indicated their preference for logo prominence on the headphones that they would buy using two items ($M = 5.93, SD = 3.27, r = .66, p < .001$; “Would you prefer to have a small (1) or a big (7) logo of the brand Tooler on the headphones” and “Would you prefer to have a non-prominent (1) or a prominent (7) logo of the brand Tooler on the headphones”). Participants also indicated how important it would be for them to feel competent performing the activity using the headphones (1 = “not important at all”, 7 = “very important”; $M = 5.07, SD = 2.09$).

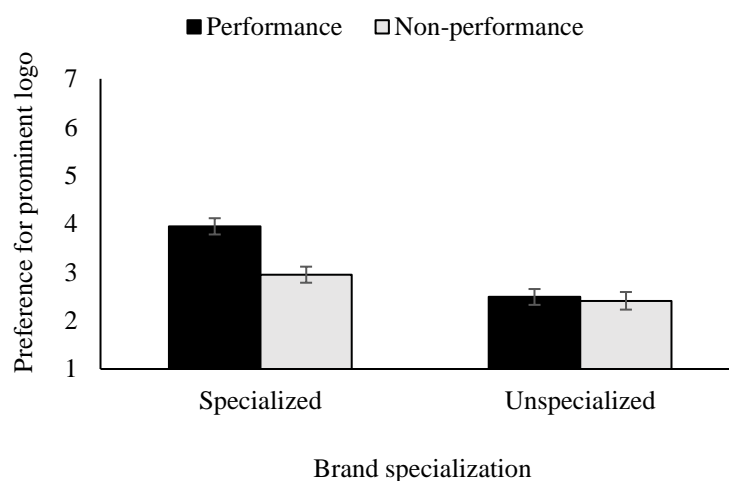
Results and Discussion

An ANOVA predicting logo size preference with performance (performance vs. non-performance) and brand specialization (specialized vs. unspecialized) as fixed factors revealed a significant main effect of performance ($F(1, 318) = 10.04, p = .002, \eta_p^2 = .031$): once again, preferences for a prominent (over a subtle) logo were stronger in the performance than in the non-performance context ($M_{\text{Perf}} = 3.20, M_{\text{NonPerf}} = 2.70$). In addition, there was a significant main effect of the brand’s degree of specialization ($F(1, 318) = 34.32, p < .001, \eta_p^2 = .097$), indicating that participants’ preferences for a prominent logo were stronger when the brand

was specialized than when it was unspecialized ($M_{\text{Spec}} = 3.44$, $M_{\text{Unspec}} = 2.46$). Importantly, as predicted and shown in Figure 5, there was a significant performance \times brand specialization interaction ($F(1, 318) = 7.47$, $p = .007$, $\eta_p^2 = .023$). Whereas participants' preferences for a prominent logo were significantly stronger in the performance (vs. non-performance) context when the brand was specialized ($M_{\text{SpecPerf}} = 3.95$ vs. $M_{\text{SpecNonPerf}} = 2.95$; $F(1, 318) = 18.07$, $p < .001$, $\eta_p^2 = .054$), their preferences for a prominent logo across the performance and non-performance contexts did not vary when the brand was unspecialized ($M_{\text{UnspecPerf}} = 2.49$ vs. $M_{\text{UnspecNonPerf}} = 2.41$; $F(1, 318) = .09$, $p = .763$, $\eta_p^2 < .001$).

Finally, we ran a moderated mediation analysis (model 14), in which the independent variable (performance vs. non-performance context) impacts the mediator (desire to feel competent) across conditions, but the mediator more strongly drives the outcome (prominent logo preference) at one level of the moderator (specialized brand) than the other (unspecialized brand). The results revealed a significant moderated mediation ($b = .230$, $SE = .094$, $95\% \text{ CI} = [.044, .423]$), indicating that, while performance- (vs. non-performance) contexts boosted consumers' preferences for prominent logos because they boosted consumers' desire to feel competent, this effect was attenuated when the brand was unspecialized and a brand's association with task-based skills was weakened.

Figure 5 - Effect of Brand Specialization on Preferences for Prominent Logos in Performance Contexts



Study 6 provided evidence for the third boundary condition that has substantive implications. The results indicate that displaying prominent logos on performance products may be effective for specialized brands, but less effective for unspecialized brands.

2.3 General Discussion

The present research identifies a novel theoretical account for when and why prominent logos can create value for consumers and brands. Ten studies show that consumers have a higher preference for prominent logos in performance (vs. non-performance) product categories and contexts, because they expect prominent logos to make them feel competent in activities that require specific skills. Further, our findings show that, beyond serving a social signaling function examined in prior research, prominent logos can act as a self-signaling tool which positively affects consumers' self-view by boosting feelings of efficacy. Thus, our work indicates that self-signaling motivations are an important driver of product preferences within performance contexts, and they reduce the negative connotations of prominent logos in such contexts. Finally, consumers' preference for prominent logos on performance products is attenuated when: (a) consumers perform an easy (vs. difficult) skill-based activity, (b) consumers are less (vs. more) motivated to improve in the skill-based activity, and (c) the brand is unspecialized (vs. specialized) in the skill-based activity.

2.3.1 Theoretical Contributions

Our findings contribute to multiple streams of research. First, our findings contribute to the literature on brand logo size and prominence. Prior studies have focused on social signaling motives to explain consumers' preferences for subtle or prominent logos. Our work offers a different perspective by demonstrating that in performance contexts, consumers'

preferences for prominent logos are mainly driven by self-signaling motives, with the goal to boost feelings of self-efficacy. Our unique finding vis-à-vis prior work further underscores that performance products represent an important overlooked context for understanding consumer preferences in general and brand logo prominence effects, more specifically.

Second, our findings contribute to the literature on self-efficacy. Whereas prior research shows that perceptions of self-efficacy are mainly influenced by past experiences of individuals and similar others (Bandura 2010; Festinger 1954; Schunk 1989; Wood and Bandura 1989), our work suggests that consumption of certain products (i.e., with prominent logos) may also significantly contribute to individuals' feelings of self-efficacy. Moreover, whereas extant literature has explored how consuming products that offer or promise objective enhancements in product functions or features impacts people's actual performance (e.g., Garvey, Germann, and Bolton 2015; Shiv, Carmon, and Ariely 2005), we examine the impact of consuming products with different design characteristics (logo size), which lack actual or perceived enhancements in product functions or features, on consumers' subjective perceptions of their skills and competence, which may (or may not) further impact actual performance. Importantly, we identify novel boundary conditions of self-efficacy effects in product preferences, which further advances research on when, how, and why self-efficacy motives drive consumer behavior. For example, we show that brand strategy with respect to specialization in a specific domain modulates the impact of self-efficacy concerns on product preferences. Self-efficacy motives drive product preferences only when a brand's products specialize in the focal activity, but not when a brand is unspecialized in the activity.

Third, we contribute to the marketing literature by proposing a novel classification of products along the previously unexplored performance dimension. Importantly, this new classification of products provides a fresh perspective for understanding and predicting consumer behavior (e.g., choice of brand logo size) and for developing effective marketing strategies (e.g., marketing performance products).

2.3.2 *Substantive Implications*

Our work offers a series of useful substantive implications. First, our findings suggest that brands whose products are used for performing activities that require specific skills should consider displaying logos prominently. Extrapolating prior findings, brands that market higher-priced products might have wished to avoid using prominent logos. Our findings call for a more nuanced approach. They suggest that high-end brands that operate in product categories with a performance aspect, such as sports and vocational activities, might consider the use of prominent logos, as such logos may create stronger associations between the product and skills needed to perform the given tasks and, in effect, increase potential consumer demand for the product.

Second, our findings suggest that utilizing messages focused on consumers' task-related skills, expertise, and efficacy may increase the appeal of brands that operate in the performance context. Such messages may also to some extent reduce the potential negative connotations that consumers may derive from certain product design elements (such as logo size) when formulating brand meanings and perceptions.

Third, our findings indicate that prominent logos on performance products appeal to different consumer segments, regardless of consumers' level of expertise. This is because both expert and novice consumers have a stronger interest in prominent over subtle logos in performance categories. In addition, our research suggests that performance brands may benefit from investing in the specialization of their products on few identifiable activities (rather than many activities) and from communicating a specialized positioning to consumers. This is because our findings show that the more specialized the brand is in a certain skill-based activity, the more it benefits from displaying prominent logos and the less susceptible it is as a result to negative meanings associated with brand logo displays on products.

Finally, our findings indicate that the level of difficulty of the activity with which a brand is associated matters. Prominent logos are more effective in increasing performance products' appeal when the activity performed by consumers is difficult rather than easy. Hence, brand managers may wish to check the effectiveness of logo size strategies for their brand against the inherent characteristics of the activity with which their brand is linked.

2.3.3 Limitations and Opportunities for Future Research

As with many real-world phenomena, consumers' preference for prominent logos on performance products may be influenced by additional factors. First, our theorizing focuses on the competence-focused self-signaling motive behind the use of prominent logos on performance products: we document and isolate the role of this motive, while minimizing the impact of other factors. One additional factor that could potentially contribute to consumers' preference of prominent logos in certain performance contexts such as sports is the potential presence of prominent logos on products used for professional sports activities due to sponsorship. We controlled for the role of this factor in our studies by utilizing a wide variety of brands (real and fictitious) and product stimuli across sports (e.g., helmet for biking, backpack or t-shirt for tennis and mountaineering) and non-sports categories (e.g., headphones for music, apron for cooking), where prominent logos are more (e.g. tennis backpack) and less common (e.g. cooking apron) and where brands adopt diverging strategies for displaying logo size (prominently, subtly, or not at all). While our studies minimized the role of sponsorship in explaining the totality of the body of evidence that we present, it will be interesting for future work to explore the role of sponsorship on logo size preferences in the sports domain more specifically.

Second, our research has focused on the effect of logo size displayed on the product, neglecting the logo's spatial positioning. Yet, some work suggests that meanings and

perceptions that consumers ascribe to products may depend on the spatial position of the product visual on the packaging and communication materials (e.g., top vs. bottom; left vs. right; Deng and Khan 2009). In this vein, future studies could explore whether the spatial position of the logo matters in shaping perceptions of self-efficacy and competence.

Third, our work has focused on the role of competence and self-efficacy feelings derived from brand logos in the course of choosing and purchasing products. Additional research could explore whether logo size may also impact consumers' competence and self-efficacy feelings in the course of actually performing the focal activity. For example, previous research suggests that using certain brands (e.g., Apple) may influence consumers' actual performance in domains related to brand positioning (e.g., creativity; Fitzsimons, Chartrand, and Fitzsimons 2008). It will be interesting to test if consumers' *actual* performance in skill-based tasks may be influenced by brand *logo size*. Conflicting predictions may indeed emerge. On the one hand, the literature suggests that a higher perceived level of self-efficacy may improve actual performance (Bandura 1982; Schunk 1995; Shiv et al. 2005). On the other hand, the size of a logo, being merely a brand symbol, does not change consumers' actual skills; instead, through their greater prominence on products, large logos could increase consumers' awareness of the skills required to perform the task and their own potential deficiencies, thereby potentially reducing consumers' actual task performance. Indeed, in the luxury domain, consuming eminent luxury (vs. non-luxury) brands leads consumers to question their deservingness of the high status that such brands bestow, which ultimately lowers consumers' feelings of authenticity (Goor et al. 2020). A similar outcome could ensue from consuming loud products in performance contexts when performing skill-based tasks.

Finally, our work links individuals' perceptions of *self* to their consumption of prominent logos. It will be interesting for future work to extend the investigation to how consumers may be perceived by *observers* when utilizing prominent or subtle logos in performance and non-performance contexts. Past research has shown that prominent logos are

often perceived by observers as ostentatious, arrogant, and excessive (e.g., Ferraro, Kirmani, and Matherly 2013; Wilcox et al. 2009). In contrast, our findings would suggest that when prominent logos are associated with performance products, the negative effects of such logos on observer perceptions may be reduced. The performance component of products may justify the prominent display of brand logos and promote positive attitudes towards the product and the consumer, not just from consumers' standpoint, as we show in our studies, but also from observers' standpoint. It will be interesting for future research to test these possibilities.

3 PERFORMANCE PRODUCTS SCALE DEVELOPMENT

In this essay, we develop and validate a new scale that measures the extent to which a product is performance-related. Specifically, we followed established scale development procedures (e.g., Churchill 1979; DeVellis 2016; Netemeyer, Bearden, and Sharma 2003) to create a short unidimensional scale that measures the construct of “performance products”, which we define as products that are used when performing activities that require skills.

This research contributes to the marketing literature by proposing a novel classification of products along the previously unexplored performance dimension. We show that this new classification is distinct from existing conceptualizations of products along the utilitarian (vs. hedonic) and the identity-relevant (vs. identity-irrelevant) dimensions. Importantly, this new classification of products provides a fresh perspective to scholars for understanding and predicting consumer behavior (e.g., consumers’ preferences for brand logo size, see Chapter 2) and to marketers for developing effective marketing strategies (e.g., how to market products used in performance versus non-performance contexts).

3.1 Item Generation

First, we generated an initial pool of items based on a comprehensive literature review as well as an extensive search of dictionaries for items that reflect our focal construct. This procedure generated an initial pool of 23 items. Next, we removed items that were ambiguous or semantically equivalent which reduced the initial item pool to seven items (Table 1).

Table 1 - Reduced Pool of Items for the Scale Development

Items
This product can be associated with skills related to performing an activity
This product can be associated with proficiency at performing an activity
This product can be associated with mastery
This product can be associated with some kind of achievement
This product can be associated with competency in an activity
This product can be associated with performance related to an activity
This product can be associated with practicing and exercising

3.2 Content Validity

To test the content validity of the identified items, nine independent judges (all Ph.D. students) rated each item on its representativeness of the core “performance products” construct. Following established procedures, we provided judges with the definition of performance products (i.e., products that are used when performing an activity that requires skills) and asked them to rate the extent to which each item was “not representative” (1), “somewhat representative” (2), or “clearly representative” (3) of the construct. To compare the content validity of our items with that of other related scales, we also asked the judges to rate items from the utilitarian versus hedonic products scale (Voss, Spangenberg, and Grohmann 2003) on their representativeness of the key “performance products” construct. We randomized the order of all items. Overall, the judges rated the seven items to be representative of our construct (representativeness means ranged between 2.33 and 2.89 on a 1-to-3 scale) and the items from the utilitarian versus hedonic products scale to be non-representative of our construct (representativeness means ranged between 1.22 and 1.78). The grand means of our proposed items were more than one scale point higher in terms of the representativeness score than the items of the utilitarianism scale ($\Delta = 1.13$). Taken together, these findings corroborate the content validity of our proposed scale.

3.3 Measure Development and Validation

With the goal to develop a scale that is able to discriminate between performance and non-performance products, we first tested whether consumers would rate products that are a-priori known to be performance-related higher on the proposed product performance scale than products that are a-priori known to be non-performance-related.

We first selected DJ headphones and a ski helmet as performance-related products, and a necklace and a cooler as non-performance-related products. A pre-test ($N = 49$, $M_{\text{age}} = 37.85$, 44% females, MTurk) confirmed that the definition of performance products (1 = “definitely does not apply”, 5 = “definitely applies”) applied more to DJ headphones ($M = 3.39$) and a ski helmet ($M = 3.73$) than to a necklace ($M = 2.22$) and cooler ($M = 2.53$), respectively ($F(1, 48) = 27.96$, $p < .001$). We then asked 52 participants ($M_{\text{age}} = 33.15$, 32% female, MTurk) to rate the four products on the seven product performance items (1 = “strongly disagree”, 7 = “strongly agree”). The results showed that the DJ headphones and the helmet (respectively, $M = 5.32$ and $M = 5.45$) were rated significantly higher on our performance scale than the cooler and the necklace (respectively, $M = 4.55$ and $M = 4.55$; $F(1, 50) = 19.90$, $p < .001$).

For scale purification, we conducted a series of exploratory factor analyses (EFAs) subsequently for each product category. To develop a reliable unidimensional scale, we omitted: (a) items with substantial cross-loadings (.3 or higher, see Tabachnick, Fidell, and Ullman 2007); (b) items for which the difference between loadings on the intended factor and cross-loadings was lower than .2 (Ferguson and Cox 1993); and (c) items that were problematic in terms of internal consistency (i.e., items which, if deleted, would increase the reliability of the scale), until the remaining items loaded on one single factor for each product category. This process reduced the original scale from seven to four items (Table 2) which loaded, in each product category, on a single factor. Internal consistency of this four-item scale was satisfactory across all four product categories (DJ headphones: $\alpha = .75$; ski helmet: $\alpha = .84$; necklace: $\alpha = .95$; cooler: $\alpha = .93$).

Table 2 - Scale Items Resulting from Exploratory Factory Analysis

#	Items
Item 1	This product can be associated with skills related to performing an activity
Item 2	This product can be associated with proficiency at performing an activity
Item 3	This product can be associated with competency in an activity
Item 4	This product can be associated with practicing and exercising

In addition, EFAs for each product category using the reduced item set produced one-factor solutions for each product, which demonstrates that the scale is unidimensional and measures only one construct (Table 3). In sum, these procedures resulted in a short, unidimensional, generalizable and reliable scale.

Table 3 - Factor Loadings for Each Product Resulting from Exploratory Factor Analysis

	DJ Headphones	Ski Helmet	Necklace	Cooler
Item 1	.770	.833	.908	.899
Item 2	.685	.699	.903	.894
Item 3	.816	.914	.902	.843
Item 4	.399	.562	.894	.863

We also performed a series of confirmatory factor analyses (CFAs) for each of the four product categories, to confirm the scale structure. The overall fit statistics and the composite reliability values were satisfactory (CR = .873, Table 4). The average variance extracted (AVE) values were above the recommended threshold of 0.50 (AVE = .659) and confirmed the within-scale convergent validity (Fornell and Larcker 1981).

Table 4 - Results of Confirmatory Factor Analysis

	n	χ^2	d.f.	GFI	NFI	NNFI	CFI	RMSEA	SRMR	AVE	CR
Headphones	52	0.868	2	0.991	0.987	1.058	1.000	.000	.024	.473	.771
Helmet	52	5.683	2	0.949	0.944	0.884	0.961	.185	.051	.587	.847
Necklace	51	1.571	2	0.984	0.992	1.007	1.000	.000	.011	.814	.945
Cooler	52	0.997	2	0.990	0.994	1.017	1.000	.000	.011	.763	.929
Average				0.979	0.979	0.992	0.990	.046	.024	.659	.873

Notes: GFI = Goodness of Fit Index, NFI = Normed Fit Index, NNFI = Non-normed Fit Index, RMSEA = Root Mean Square Error of Approximation.

3.4 Known-Groups Validity

To test for known-groups validity, we performed a repeated-measures ANOVA on our proposed scale with product category (performance vs. non-performance) as the between-participants factor and product replicate (headphones vs. helmet; necklace vs. cooler) as the within-participants factor. The results revealed that participants rated performance products

significantly higher than non-performance products on our proposed scale ($M = 5.43$ vs. $M = 4.46$; $F(1, 49) = 19.86, p < .001$). In addition, the two-way interaction between product category and replicate was not significant ($F(1, 49) = .91, p = .346$), which suggests that the results were robust across product replicates. These findings corroborate the ability of our scale to effectively distinguish products along the performance dimension.

3.5 Discriminant Validity

To establish discriminant validity, we tested whether our proposed scale is empirically distinct from related existing scales, and, accordingly, whether it can classify products differently compared to existing scales. Specifically, we examined whether the construct that our proposed scale measures is different from what the hedonic versus utilitarian (Voss et al. 2003) and the identity relevance (Berger and Heath 2007) scales measure.

We first selected 11 performance and 11 non-performance products categories, which we used in the studies of Chapter 2. A series of pre-tests ($N = 452, M_{\text{age}} = 35.51, 45\%$ females, MTurk) confirmed the predicted categorization of performance versus non-performance products (Table 5). Specifically, for each pair of performance versus non-performance products (tennis backpack vs. backpack, ski gloves vs. gloves, mountain bike t-shirt vs. t-shirt, toolbox vs. cooler, ski helmet vs. hat, surf rash vest vs. t-shirt, mountain bike vs. city bike, regatta sailing shoes vs. leisure sailing shoes), participants were given the definition of performance products and were asked to indicate the extent to which the definition applied to the product (1 = “it is not a performance product at all”, 5 = “it is definitely a performance product”). For each pair of performance versus non-performance contexts, participants were shown each context (performing as a DJ vs. listening to music for headphones; participating in a bike race vs. casually biking in the city for bike helmet; mountaineering vs. relaxing and enjoying the view in the mountains for mountaineering t-

shirt). Participants were then given the definition of a performance context, and they rated the extent to which the definition applied (1 = “it is not a performance-related context at all”, 5 = “it is definitely a performance-related context”).

Table 5 - List of Products and Results of Pre-Test Examining the Relevance of Performance Product Definition

Performance	Mean	Non-performance	Mean	t-test
Tennis backpack	3.30	Backpack	2.56	$t(98) = 3.00$ **
Ski gloves	4.44	Gloves	2.72	$t(98) = 7.82$ ***
Mountain bike t-shirt	3.98	T-shirt	2.36	$t(98) = 6.91$ ***
Toolbox	3.82	Cooler	2.76	$t(98) = 3.71$ ***
Ski helmet	4.26	Hat	2.80	$t(98) = .03$ ***
Surf rush vest	3.98	T-shirt	2.84	$t(98) = 4.08$ ***
Mountain bike	4.38	City bike	3.94	$t(98) = 2.49$ *
Headphones DJ	4.41	Headphones music	1.34	$t(99) = 17.90$ ***
Bike helmet for race	4.42	Bike helmet for city	3.18	$t(98) = 6.64$ ***
Regatta sailing shoes	4.32	Leisure sailing shoes	2.92	$t(99) = 6.12$ ***
Mountaineering t-shirt	4.22	T-shirt	2.06	$t(98) = 10.04$ ***

Notes: *** = $p < .001$; ** = $p < .01$; * = $p < .05$.

Second, 1,209 participants ($M_{age} = 35.81$, 53% female, MTurk) were randomly assigned to one of the 21 product categories. For each of the 21 product categories, participants were shown three typical product pictures which helped them visualize the product. Participants were then asked to rate the products on our new performance products scale, on the utilitarian and hedonic product scales (Voss et al. 2003), as well as on the product identity-relevance scale (Berger and Heath 2007).

A series of paired t -tests showed that participants rated performance products consistently higher on our scale than non-performance products. We could not detect significant differences between the product pairs along the other two scales (Table 6).

Table 6 - Performance versus Non-Performance Products Tested on the Performance, Identity-Relevance, and Utilitarian versus Hedonic Products Scales

Scale	Performance	Mean	Non-Performance	Mean	t-test
Performance products scale	Tennis backpack	5.29	Backpack	4.57	$t(100) = 2.92$ ***
	Ski gloves	5.65	Gloves	4.72	$t(98) = 4.01$ ***
	Mountain bike t-shirt	5.75	T-shirt	4.31	$t(100) = 5.76$ ***
	Toolbox	4.96	Cooler	4.32	$t(99) = 2.65$ ***
	Ski helmet	5.37	Hat	3.55	$t(98) = 7.36$ ***
	Surf rush vest	5.66	T-shirt	4.31	$t(99) = 5.58$ ***
	Mountain bike	5.85	City bike	5.67	$t(100) = 1.24$
	Headphones DJ	5.28	Headphones music	4.76	$t(97) = 2.64$ *
	Bike helmet for race	5.45	Bike helmet for city	5.41	$t(99) = .17$
	Regatta sailing shoes	5.47	Leisure sailing shoes	4.89	$t(99) = 2.32$ *
	Mountaineering t-shirt	5.67	T-shirt	4.31	$t(99) = 5.53$ ***
Utilitarian products scale ¹	Tennis backpack	5.04	Backpack	5.47	$t(100) = 1.58$
	Ski gloves	5.56	Gloves	5.91	$t(98) = 1.24$
	Mountain bike t-shirt	4.93	T-shirt	5.35	$t(100) = 1.57$
	Toolbox	5.71	Cooler	5.95	$t(99) = -1.02$
	Ski helmet	5.90	Hat	5.64	$t(98) = .92$
	Surf rush vest	5.16	T-shirt	5.34	$t(99) = -.68$
	Mountain bike	5.09	City bike	5.50	$t(100) = -1.63$
	Headphones DJ	5.03	Headphones music	5.53	$t(97) = -1.87$
	Bike helmet for race	5.58	Bike helmet for city	6.04	$t(99) = -1.43$
	Regatta sailing shoes	4.73	Leisure sailing shoes	4.63	$t(99) = .31$
	Mountaineering t-shirt	5.29	T-shirt	5.34	$t(99) = -.25$
Hedonic products scale ¹	Tennis backpack	4.44	Backpack	4.45	$t(99) = .02$
	Ski gloves	4.50	Gloves	4.02	$t(97) = -1.77$
	Mountain bike t-shirt	4.78	T-shirt	4.48	$t(100) = -1.19$
	Toolbox	3.58	Cooler	4.04	$t(99) = -1.82$
	Ski helmet	3.92	Hat	4.24	$t(98) = -1.43$
	Surf rush vest	4.18	T-shirt	4.48	$t(99) = -1.16$
	Mountain bike	5.39	City bike	5.33	$t(100) = .22$
	Headphones DJ	4.81	Headphones music	5.17	$t(97) = -1.45$
	Bike helmet for race	4.21	Bike helmet for city	3.96	$t(99) = .81$
	Regatta sailing shoes	4.64	Leisure sailing shoes	4.60	$t(99) = .11$
	Mountaineering t-shirt	4.74	T-shirt	4.48	$t(99) = 1.03$
Product identity-relevance scale	Tennis backpack	4.45	Backpack	4.48	$t(100) = -.12$
	Ski gloves	3.95	Gloves	3.77	$t(98) = .61$
	Mountain bike t-shirt	4.70	T-shirt	4.26	$t(100) = 1.62$
	Toolbox	3.70	Cooler	2.83	$t(99) = 3.43$
	Ski helmet	3.91	Hat	4.19	$t(98) = -1.10$
	Surf rush vest	4.19	T-shirt	4.27	$t(99) = -.29$
	Mountain bike	4.47	City bike	4.54	$t(100) = -.28$
	Headphones DJ	4.37	Headphones music	4.28	$t(97) = .33$
	Bike helmet for race	4.25	Bike helmet for city	4.10	$t(99) = .53$
	Regatta sailing shoes	4.74	Leisure sailing shoes	5.16	$t(99) = -1.80$
	Mountaineering t-shirt	4.55	T-shirt	4.27	$t(99) = 1.07$

Notes: ¹Reverse coded; Performance refers to performance products, Non-Performance refers to non-performance products; *** = $p < .001$; ** = $p < .01$; * = $p < .05$.

As a final test to establish discriminant validity, we compared the squared correlations among the four scales (performance, utilitarian, hedonic, identity-relevance) with their individual average variances extracted (AVEs) for all 11 performance products (tennis

backpack, ski gloves, mountain bike t-shirt, toolbox, ski helmet, surf rush vest, headphones, mountaineering t-shirt, regatta sailing shoes, bike helmet, mountain bike) (Fornell and Larcker 1981). Table 7 shows that the AVE estimates exceeded the squared correlations for all the products, which provided evidence for our measure's discriminant validity.

Table 7 - Discriminant Validity Tests

	AVE / Squared Correlations				AVE / Squared Correlations			
	Performance	Identity	Utilitarian	Hedonic	Performance	Identity	Utilitarian	Hedonic
	Tennis Backpack				Ski Gloves			
Performance	.636				.538			
Identity	.343	.657			.029	.588		
Utilitarian	.011	.004	.657		.188	.147	.780	
Hedonic	.281	.420	.157	.702	.110	.000	.225	.690
	Mountain Bike T-shirt				Toolbox			
Performance	.669				.537			
Identity	.189	.784			.360	.665		
Utilitarian	.097	.003	.757		.070	.044	.761	
Hedonic	.178	.052	.300	.792	.038	.062	.061	.686
	Ski Helmet				Surf Rush Vest			
Performance	.459				.587			
Identity	.049	.756			.104	.829		
Utilitarian	.042	.077	.838		.104	.000	.726	
Hedonic	.160	.045	.073	.720	.017	.033	.295	.774
	Headphones				Mountaineering T-Shirt			
Performance	.559				.625			
Identity	.173	.804			.517	.637		
Utilitarian	.387	.023	.722		.156	.521	.657	
Hedonic	.276	.127	.383	.807	.012	.114	.397	.772
	Regatta Sailing Shoes				Bike Helmet			
Performance	.606				.534			
Identity	.593	.621			.171	.855		
Utilitarian	.232	.178	.742		.004	.002	.820	
Hedonic	.230	.376	.573	.766	.036	.058	.141	.677
	Mountain Bike							
Performance	.467							
Identity	.106	.995						
Utilitarian	.137	.043	.610					
Hedonic	.071	.016	.328	.778				

3.6 Nomological and Predictive Validity

We tested the nomological validity of our measure by linking it to constructs that we expected to be theoretically related to the *performance product* construct (see Chapter 2).

Since performance products are used in activities that require certain skills, we expected that

the use of such products would make consumers feel competent in the activity. To this end, we examined the relationship between our proposed performance product scale and participants' product-related *feelings of competence*. As a benchmark, we also examined the relationship between product-related feelings of competence and product utilitarianism. We expected feelings of competence to be more strongly related to ratings of products on our performance scale than on the utilitarian scale.

In addition, we tested the predictive validity of our measure by establishing the extent to which the proposed performance product measure could effectively predict consumers' *desire to be competent*. We expected that, when using a performance product, consumers would desire to feel competent in the activity related to the product. This test would also further support the theoretical expectations in our paper (see Chapter 2).

To this end, we first selected four products not used in our studies that were a-priori known to be performance products (art paint brush, skis, diving suit, climbing shoes). We then asked 203 participants ($M_{\text{age}} = 32.53$, 37% female, MTurk) to rate one randomly assigned product on the extent to which it was (1) a performance product, (2) a utilitarian product, (3) would make participants feel competent, and (4) would make participants want to be competent. We measured product performance with our scale and product utilitarianism as before; we measured feelings of competence, which we used to test nomological validity, with four items adapted from Dahl and Moreau (2007) ("I would feel efficacious / competent / proficient / skilled when using [product]"; $\alpha = .884$); and we measured the desire to feel competent with two items, which we used to test predictive validity ("It would be important to me to feel competent when using [product]"; "I would like to feel competent when using [product]"; $\alpha = .837$). In addition, we also measured the desire to be seen by others as competent using two items ("It would be important to me that others feel that I am competent when using [product]"; "I would like that others think that I am competent when using

[product]”; $\alpha = .886$), which we used to compare the extent to which performance product ratings predict the desire to signal competence to self versus others.

Nomological Validity: Consumers’ Competence Feelings. To test nomological validity, for each product, we estimated a structural equation model and computed correlations between performance product ratings and consumers’ competence feelings, and between product utilitarianism ratings and consumers’ competence feelings. Consistent with our theory, across products, the correlation between the performance product and consumers’ competence feelings was significantly positive and much stronger than the correlation between the product utilitarianism ratings and competence feelings, thus supporting our measure’s nomological validity (Table 8).

Table 8 - Nomological Validity: Descriptive Statistics and Correlations of Performance Product and Product Utilitarianism Ratings with Consumers’ Competence Feelings

	N	Performance		Competence		Utilitarianism		Performance- Competence Correlation	Utilitarian- Competence Correlation
		Mean	SD	Mean	SD	Mean	SD		
Paint brush	51	5.32	.91	5.17	1.22	5.44	1.40	.660	-.042
Skis	50	5.57	.82	4.97	1.41	4.47	1.71	.520	-.147
Diving suit	50	5.74	.80	5.26	1.19	4.90	1.79	.668	.054
Climbing shoes	52	5.50	.89	5.09	2.31	4.71	1.80	.920	.260

Predictive Validity: Consumers’ Desire to Feel Competent. To test predictive validity, we estimated a structural equation model with either the performance product or product utilitarianism rating as an exogenous (latent) variable and consumers’ desire to feel competent (overall, and separately in the eyes of self or others) as an endogenous (latent) variable. The resulting structural path coefficient showed that consumers’ desire to feel competent was significantly positively influenced by products’ performance rating, but not by products’ utilitarianism rating (Table 9). Moreover, a Chow Test showed that performance product ratings predicted the desire to feel competent more strongly than the desire to be seen as competent by others ($F(3, 398) = 2.47, p = .062$). These results confirm our scale’s predictive validity.

Table 9 - Predictive Validity: Impact of Performance Product and Product Utilitarianism Ratings on Consumers' Desire to Feel Competent (Path Coefficients)

	Overall Desire for Competence		Desire to Feel Competent		Desire to be Seen as Competent	
	Performance	Utilitarian	Performance	Utilitarian	Performance	Utilitarian
Paint brush	.620**	.123	.675***	.288*	.561***	.082
Skis	1.141***	.105	1.229***	.069	.680**	.080
Diving Suit	.958***	.129	.914***	.199	.688***	.331*
Climbing Shoes	1.066***	.100	1.003***	.033	.851***	.221

Notes: *** = $p < .001$; ** = $p < .01$; * = $p < .05$.

3.7 General Discussion

In this essay, we introduced a new classification of products along the performance dimension. We followed established scale development procedures to develop a short, valid, and reliable scale that measures the extent to which a product (or a category) is performance-related. The discriminant validity test showed that this new classification can explain consumer behaviors distinctly from related existing classification schemes based on products' utilitarian versus hedonic characteristics (e.g., Voss, Spangenberg, and Grohmann 2003) and identity-relevant versus irrelevant characteristics (e.g., Berger and Heath 2007). Moreover, the nomological and the predictive validity test showed that this classification could be useful for assessing consumers' feelings and desire of competence, which can in turn affect their product design preferences (e.g., their preference for logo size on products, as shown in Chapter 2). Hence, this scale can support researchers to develop a richer understanding of consumers' behavior.

Apart from its theoretical value, the proposed scale and classification of products into performance (vs. non-performance) categories is valuable from a substantive standpoint, as the share of performance products in the consumer goods market is substantial and rapidly growing. For example, the sales of kitchen tools alone (used in cooking activities) amounted to \$1.2 billion in the United States in 2017 (Statista 2019); the sales of hand tools (used in home repair activities) the same year amounted to \$14.8 billion worldwide and were projected

to grow by another \$3 billion by 2020 (Future Market Insights 2017); and the sales of sports apparel products (used in sports activities) amounted to \$173.78 billion in 2018, with average an annual growth rate of \$5 billion (Statista 2019). Hence, the categorization of products along the performance dimension can support companies to develop more tailored marketing strategies.

4 UPCYCLING: CREATING VALUE FROM WASTE

One of today's major societal challenges is the excessive exploitation of resources (WWF 2020). Although resources are limited, companies' hunger for resources to create products has risen dramatically in recent decades (UN Environment Programme 2019). This development is fueled by an overconsumption of disposable products (e.g., McCollough 2006) and by consumers throwing away perfectly functioning products because they do not like them anymore and would prefer a new or better version (e.g., Bellezza, Ackerman, and Gino 2017; Ferguson, Guide, and Suoza 2006). Because of the detrimental environmental and societal effects of overconsuming resources (e.g., resource extinction, pollution, conflicts for resources, etc.), governments and environmental agencies have called for a more efficient use of existing resources (European Environment Agency 2019; UN Sustainable Development 2019; U.S. Environmental Protection Agency 2019).

In response to this call, many companies have introduced sustainable practices that reduce the use of new resources by reusing old resources. For example, companies sell repaired and repackaged products (e.g., Apple's certified refurbished products, Levi's tailor shop), or sell new products made out of recycled materials (e.g., Adidas x Parley, H&M conscious collection). Recently, companies have also introduced a new way of reusing existing resources to create new products: upcycling. Upcycling involves creating new products by reusing one or more components from old, used or unwanted products (Bridgens et al. 2018; Wilson 2016). In contrast to recycling, which requires a full decomposition of an old product (e.g., glass from old bottles is crushed and melted to make a new product), upcycling requires only a *partial* decomposition of an old product (e.g., the body of a glass bottle is used as a shade for a lamp). The outdoor clothing manufacturer Patagonia, for instance, upcycles old raincoats to create travel cases; the bag producer Freitag upcycles old truck tarpaulins, used car seatbelts, and discarded bicycle inner tubes to produce bags; or

Southwestern Airlines upcycles its leather airplane seat covers and turns them into bags and wallets. Not only have big established companies started reusing old resources to create new products, but many Do-It-Yourself and online communities specializing in upcycled products have also emerged and are rapidly expanding. For example, the main online marketplace for upcycled products, Etsy.com, increased its offering of products tagged with the word “upcycled” from 7,900 products in 2010 up to about 200,000 products today.

Despite their increasing availability, it is unclear how consumers react to upcycled products. Although initial conceptual research assumed that consumers would appreciate the enhanced sustainability of upcycling practices (Frank 2013; McDonough and Braungart 2002; Szaky 2014; Wilson 2016), extant research shows that consumers are often reluctant to buy products made out of old or used materials (Meng and Leary 2019). Consumers may feel repulsed and disgusted by products with components that were previously used by other consumers (Argo, Dahl, and Morales 2006). At the same time, consumers may also feel that upcycled products are of lower quality because they consist in part of old and used materials (Abbey et al. 2015; Ovhcinnikov 2011; Van Weelden, Mugge, and Baker 2016). Accordingly, positive attitudes towards upcycled products resulting from sustainability perceptions might be offset by consumers’ concerns regarding contagion and/or quality of upcycled products.

In this paper, we introduce a framework that departs from sustainability, contagion and quality as existing explanations for why consumers may like or dislike upcycled products and focus instead on perceived creativity as a novel explanation. This allows us to make nuanced predictions with respect to why and when consumers perceive *some* upcycled products to be more appealing than others. Specifically, we propose that the appeal of upcycled products depends on the dissimilarity between the functions of the upcycled and the old product. While intuition may suggest that product appeal may be lower in case of highly dissimilar functions (i.e., products made out of highly dissimilar old products might not be viewed as efficacious), we hypothesize that the appeal of an upcycled product may instead be higher when the

function of the old product (e.g., a bottle containing liquid) and the function of the upcycled product (e.g., a lamp producing light) are more dissimilar. We posit that assigning a different function to an old product makes consumers realize that the product's functionality is not fixed and that this realization triggers an "aha!-experience", which increases perceived creativity and product appeal. Although extant literature commonly praises the positive value of creativity, we show that enhanced *perceptions* of creativity only increase product appeal under certain conditions, reflecting the idea that creativity is not necessarily or universally desired.

This paper makes several theoretical and substantive contributions. First, our research advances extant empirical research on upcycling by providing a better understanding of how objective product characteristics (i.e., function dissimilarity) can enhance the appeal of upcycled products. Hence, the focus of our research is not on how to effectively promote upcycled products, for example, through storytelling (Kamleitner, Thürridl, and Martin 2019), but rather how to effectively *design* such products. Moreover, by documenting how producers can reuse resources in the design of new products to make them appealing to consumers, our findings go beyond the sustainability motives that previous research has used to explain the appeal of upcycled products (Frank 2013; McDonough and Braungart 2002; Szaky 2014; Wilson 2016) and unearth a novel path for creating value out of existing resources without consuming new ones.

Second, our research contributes to the creativity literature by offering a better understanding of the antecedents of perceived creativity. We propose that the sudden realization that functional fixedness is overcome (i.e., when an old product performs a dissimilar function) increases perceived creativity. We contribute to the literature by showing that merely observing a solution to a problem (i.e., functional fixedness) can trigger an aha!-experience in the observer. Put differently, consumers can experience a eureka moment without having to be actively engaged in a problem-solving process, like inventors or

designers. Rather than focusing on the creative idea generation process and its respective antecedents and requirements (e.g., Dahl and Moreau 2002; Franke, Poetz, and Schreier 2013; Goldenberg and Mazursky 2002), we focus on antecedents of consumers' perceptions of creativity.

Third, our research contributes to the creativity literature by shedding new light on one of the consequences of perceived creativity and documenting the conditions under which it increases product appeal and purchasing intentions. Building on the argument that creativity is often not valued (Breidenthal et al. 2020; Mueller, Melwani, and Goncalo 2011; Rietzschel, Nijstad, and Stroebe 2010; Staw 1995), we contribute to the literature by documenting the conditions under which perceived product creativity has a stronger positive effect on product appeal: that is, when consumers are high (vs. low) in openness to experience and when purchasing motives center more on the experiential (vs. functional) value of a product. Instead of exploring the implicit mental association between an attitude object (such as creativity) and an evaluative dimension (Mueller, Melwani, and Goncalo 2011), we advance our understanding of when and why consumers value creativity, using explicit measures such as product appeal and purchasing behavior.

4.1 Theoretical Background

4.1.1 Resusing Old Products

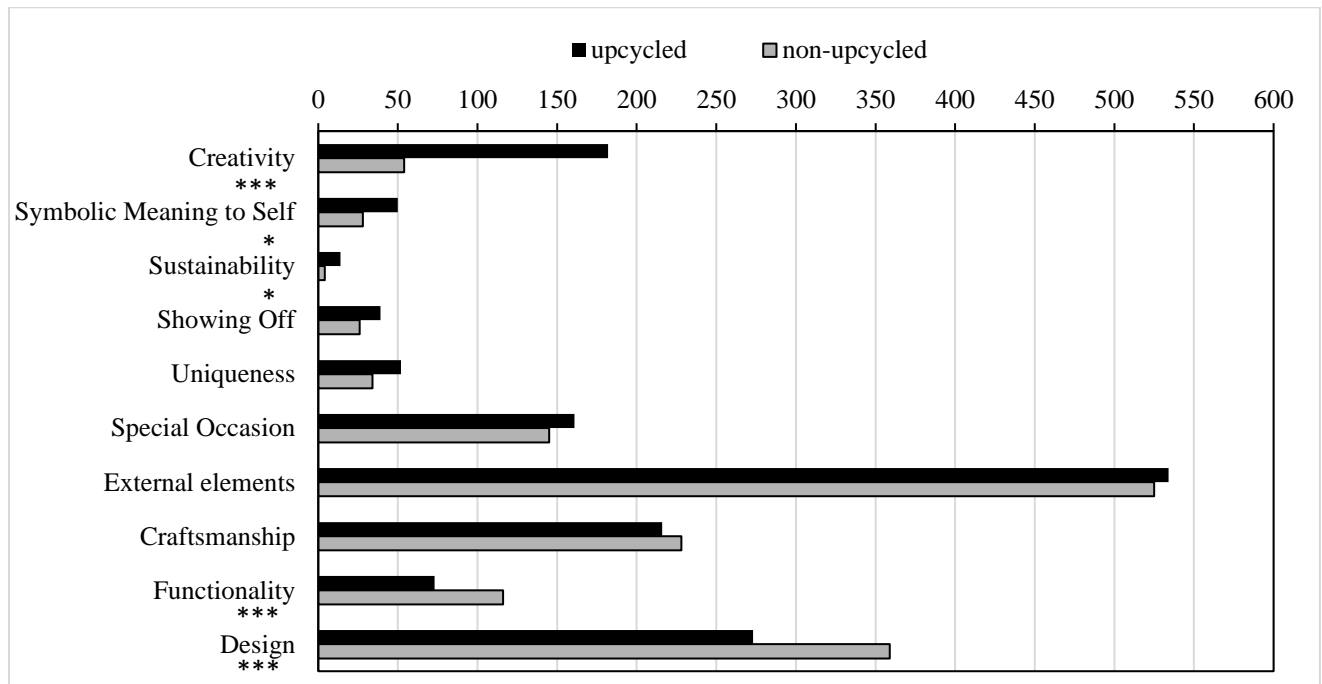
With the aim of reducing the excessive use of new resources, companies often reuse parts of old, used or unwanted products to create new products, which are commonly referred to as sustainable products (Belz and Peattie 2009; Ottman 1998). In this process of creating new products out of old products, the level of decomposition of old products defines three different sustainable practices: refurbishing, recycling and upcycling (e.g., Szaky 2014).

Refurbishing does not require any decomposition of the old product, recycling requires a *full* decomposition of the old product into its raw materials, and upcycling requires only a *partial* decomposition of the old product into components. For example, a messenger bag is a refurbished product when it is newly sewed (no decomposition); it is a recycled product when it is made out of plastic (raw material) from PET bottles (full decomposition); whereas it is an upcycled product when it is made out of used parts of a truck tarp (partial decomposition).

While recycling destroys the function of the old product completely, upcycling preserves the function of the old product at least partially. We propose that the preservation of the function affects consumers' product perceptions. More specifically, we propose that when an old product performs a function that is dissimilar (vs. similar) from the upcycled product (e.g., using a discarded wine bottle as a lamp shade), it increases product appeal because of a higher perceived creativity.

To provide initial support for the proposition that upcycled products may be appealing because of enhanced creativity perceptions, we conducted a pilot study using data from the online shop Etsy.com (see Appendix E for all methodological details). We explored which characteristics could distinguish upcycled products from similar control products and sampled more than 2,000 reviews of more than 200 upcycled (as defined by the producer) and comparable non-upcycled products. Our analyses indicated that reviewers of upcycled products are more likely to mention keywords related to creativity, sustainability and symbolic meaning to the self, but less likely to mention keywords related to design, functionality and craftsmanship (see Figure 6). Most interestingly, almost 74% of the upcycled products contain at least one creativity keyword in their reviews, suggesting that this difference is not due to a select sample of upcycled products. However, some reviews of upcycled products contain more creativity keywords than others (range = 0-6; $M = 1.54$; $SD = 1.47$), suggesting there is some heterogeneity within the upcycled products as well.

Figure 6 - Prevalence of Keywords per Coding Category for Upcycled and Non-Upcycled Products



* = significant at $p < 0.05$ level; ** = significant at $p < 0.01$; *** = significant at $p < 0.001$

Notes: This graph shows the absolute number of keywords found for each coding category both for upcycled and non-upcycled products; total number of keywords: $N = 3,113$; total numbers of reviews: $N = 2,008$.

In the next sections, we discuss antecedents and consequences of perceived creativity *within* the category of upcycled products. We propose that higher dissimilarity between the function of the old and the upcycled product increases perceived creativity and ultimately product appeal. Afterward, we also propose boundary conditions for this relationship, where we identify situations when the effect of dissimilarity on appeal is attenuated.

4.1.2 Predictions

Over time, people learn what a product can be used for. For example, people learn that a hammer is a tool to drive nails into softer materials, a mug a container to drink hot beverages and a candle an object that illuminates a room. These learned associations, however, make it difficult to recognize that a product can be also used for other purposes (Defeyter and German 2003; German and Barrett 2005). For example, people usually see the function of a brick as being to construct a building, but, as illustrated by the Alternate Uses

Task, it could be used as a paperweight, a doorstop or a dumbbell, as well. The tendency to see the functions of objects in a specific way only is known as functional fixedness (Duncker 1945). Functional fixedness can prevent individuals from developing new ideas and/or products because they fail to imagine how existing products could be used outside their typical use context (McCaffrey 2012). Functional fixedness may also deter companies and consumers from reusing old, used or unwanted products because they cannot see how existing products can be used for purposes different from their original ones (Dusink and Latour 1996).

Extant literature has explored ways to overcome functional fixedness. For instance, instructing people to think about how to decompose objects can help overcome functional fixedness (Knoblich et al. 1999; McCaffrey 2012). This is because increasing the saliency of the individual components of an object helps individuals to identify more generic characteristics and brings to mind new potential uses that the object may offer. For example, people usually see a candle as an object for illuminating a room. However, if it is decomposed into separate components (i.e., wick and wax), people may notice that the wick can be used as a string in many more contexts (McCaffrey 2012; Metha and Zhu 2016). Likewise, we argue that exposure to upcycled products makes consumers realize how components of old products can be reused. Consumers may identify other functions in old products that they had not considered before and overcome functional fixedness. When problem solvers suddenly find a solution to a problem, they typically experience a “eureka” or “aha!” moment (Lehrer 2008; Schilling 2005; Tik et al. 2018). Realizing that old products can perform a different function could also trigger an aha!-experience. In contrast to prior research documenting aha!-experiences among individuals actively solving a problem, we propose that passively perceiving a solution to the problem can trigger an aha!-experience in a similar way. As a consequence, we propose that this aha!-moment may not only be experienced by product innovators or designers, but by regular consumers as well.

Consumers' mere observation that functional fixedness is overcome and the associated aha!-experience should increase the appeal of the upcycled product through perceived creativity. Crucially, we propose that the realization that functional fixedness is overcome will be more sudden and unexpected, when the dissimilarity between the function of the old product and the upcycled product is higher. We predict that higher function dissimilarity will lead to a stronger aha!-experience and will enhance perceived creativity accordingly.

We center our conceptualization of perceived creativity around originality and innovativeness. While creativity, originality or innovativeness are often regarded as synonyms (Acar, Burnett and Cabra 2017; Hirschman 1980), it is important to emphasize that our approach differs from how management and product innovation scholars typically conceptualize creativity (Hennessey and Amabile 2010; Runco and Jaeger 2012). These scholars often operationalize creativity as a two-dimensional construct consisting of "novelty" and "usefulness". Ideas are not creative if they are not novel, but some level of usefulness is also essential to distinguish a creative idea from an idea that is merely strange. For instance, using a brick as a hat is novel, innovative and original, but it is not very practical, useful or functional and therefore not regarded as a creative idea. While conceptualizing creativity in terms of novelty and usefulness has merit in certain contexts (e.g., creative idea generation and selection processes), its application to *perceptions* of creativity can be problematic for two reasons. First, according to this conceptualization, it would be hard to see how artwork can be regarded as creative, since art is rarely functional, practical or useful. Second, people find it difficult to view novelty and usefulness as attributes that go hand in hand; instead, people often perceive them as inversely related (Mueller, Melwani, and Goncalo 2011; Rietzschel, Nijstad, and Stroebe 2010). In addition, scholars studying perceived creativity have documented that novelty is a better and more important predictor of perceived creativity than usefulness (Diedrich et al. 2015; Runco and Charles 1993).

We propose that, in contexts where products ensure a *basic* level of usefulness, high versus low levels of function dissimilarity predict changes in perceived creativity in terms of originality and innovativeness. For example, consider a backpack made of either discarded truck tarps (high dissimilarity) or discarded bags (low dissimilarity). Because the backpack can carry goods, it is equally useful across conditions, but we predict that it will be perceived as more creative (i.e., original and innovative)—and therefore as more appealing (e.g., Dahl and Moreau 2002; Horn and Salvendy 2009)—when it consists of product components that previously performed a more dissimilar function. We predict that higher dissimilarity will ultimately increase product appeal, which may contrast with the common intuition that bringing products together with highly dissimilar functions would harm product perceptions.

H_{1a}: The positive effect of function dissimilarity on the appeal of upcycled products is mediated by perceived creativity.

H_{1b}: The positive effect of function dissimilarity on perceived creativity is mediated by the aha!-experience.

Nevertheless, we propose that the perceived creativity of upcycled products does not always increase product appeal. Although people often associate creativity with superior value (Andrews and Smith 1996) and with discovery, innovation and positive change (Hennessey and Amabile 2010), certain consumers may be ambivalent and reluctant to embrace creativity. For example, Mueller, Melwani, and Goncalo (2011) and Staw (1995) argue that while creative ideas are more novel, this novelty may come at the cost of usefulness. People are uncertain about whether novel ideas are practical and reliable (Amabile 1996). In fact, perceived novelty and perceived usefulness are often negatively correlated (Mueller, Melwani, and Goncalo 2011; Rietzschel, Nijstad, and Stroebe 2010).

We identify two conditions under which consumers would recognize but would not value the creativity of upcycled products, even when a constant and basic level of product usefulness is ensured. First, we argue that a particular personality trait (i.e., openness to

experience) predicts whether perceived creativity enhances product appeal. Openness to experience is one of the big five personality traits that denotes receptivity to new ideas and new experiences (Goldberg 1993; John and Srivastava 1999; McCrae 1993). Consumers who are more open to experience seek unconventional and unfamiliar experiences, appreciate original and unusual ideas, and like novelty and variety in their daily routines. Consumers who are less open to experience seek refuge in familiar surroundings, appreciate conventional and predictable ideas, and like routine and traditions. Openness to experience is conceptually related to creativity: individuals who are more open to experience are not only more creative (George and Zhou 2001; McCrae 1987), but they are also more likely to appreciate creative ideas or content such as art, music or literature (John and Srivastava 1999).

Hence, we expect that consumers low (vs. high) in openness to experience would find upcycled products less appealing when they are made out of an old product with a previously more dissimilar (vs. less dissimilar) function. Although we expect that both low and high openness to experience consumers would recognize the enhanced creativity triggered by function dissimilarity, consumers with low openness to experience would be less appreciative of creativity because they tend to reject what is novel. Specifically, we propose that the appeal of an upcycled product made out of an old product with a dissimilar (vs. similar) function is reduced for consumers who are less open to experience.

***H₂:** The positive effect of function dissimilarity on the appeal of upcycled products is reduced when consumers are less open to experience.*

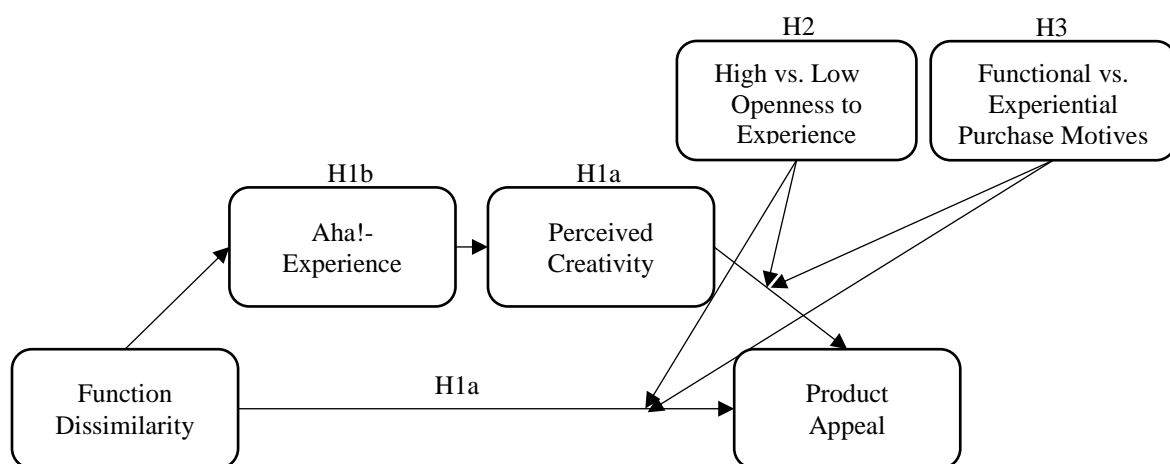
Second, we argue that the relationship between perceived creativity and product appeal depends on consumers' purchase motives. Specifically, we posit that the positive effect of creativity on appeal depends on whether the product would serve a more functional versus a more experiential purpose. A product has a functional value when it can solve a problem, is useful or performs a desired function, whereas it has an experiential value when it creates experiences, feelings and emotions (Batra and Ahtola 1999; Holbrook and Hirschman 1982;

Smith and Colgate 2007). We propose that when functional (vs. experiential) motives guide the purchase process, the positive effect of perceived creativity on product appeal would be attenuated. Thus, when consumers purchase a product for its functional value, they would appreciate it more for its usefulness and practicality than for its originality and innovativeness. This proposition resonates with findings of existing research showing that people perceive more novel ideas to be less useful (Mueller, Melwani, and Goncalo 2011; Rietzschel, Nijstad, and Stroebe 2010). We predict that when function dissimilarity is higher, consumers would perceive and recognize the enhanced creativity (i.e., originality and innovativeness) of an upcycled product regardless of their purchase motives. However, when functional (vs. experiential) motives guide the purchase process, consumers would appreciate the enhanced creativity to a lesser extent. Hence, for consumers who purchase for functional motives, the positive effect of perceived product creativity on product appeal should be attenuated.

H₃: The positive effect of function dissimilarity on the appeal of upcycled products is reduced when consumers purchase a product mainly for functional (vs. experiential) motives.

Figure 7 summarizes our conceptual model.

Figure 7 - Conceptual Model



4.2 Studies Overview

We tested our predictions in seven studies with different products, study designs and samples. Study 1 proposes dissimilarity as an antecedent of perceived product creativity by providing correlational evidence for the relationship between dissimilarity, perceived creativity and appeal. Study 2A experimentally investigates the effect of function dissimilarity on appeal and shows that upcycled products made of an old product with a dissimilar (vs. similar) function are more appealing because of perceived creativity (H_{1a}). Study 2B shows that creativity perceptions arise because consumers experience an aha!-moment (H_{1b}). Study 3 shows that upcycled products made of old products with dissimilar (vs. similar) functions are more appealing also in terms of product demand. Studies 4A and 4B shed light on consequences of perceived product creativity by showing that the effect of dissimilarity on product appeal is moderated by consumers' openness to experience (H_2). Finally, study 5 shows that the positive effect of function dissimilarity on product appeal weakens when functional (vs. experiential) motives guide the purchase process (H_3).

4.2.1 Study 1: *The Appeal of Upcycled Products*

The results of the pilot study indicate that reviews of upcycled products are more likely to contain keywords related to creativity compared to non-upcycled products. Importantly, the results also suggest considerable heterogeneity within the category of upcycled products and that some reviews of upcycled products contain more creativity keywords than other reviews of upcycled products. In study 1, we examine one of the potential antecedents of perceived creativity of upcycled products, that is, function dissimilarity. We therefore test the proposed relationship between function dissimilarity,

perceived creativity, and product appeal in a correlational study with 200 different upcycled products.

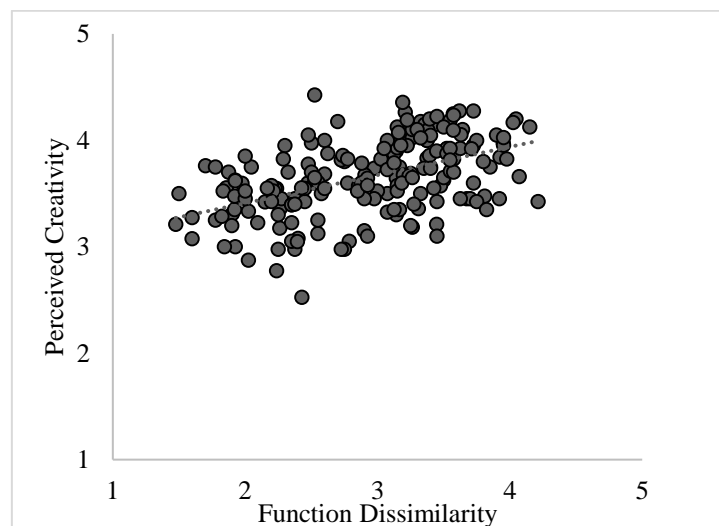
Methods

We exposed 609 participants ($M_{\text{age}} = 36.10$, 38% female, MTurk) to 20 products, which we randomly selected from a set of 200 upcycled products (randomly sampled from the online shop Etsy.com; see Appendix F). For each upcycled product, we showed participants the product picture, together with the old and the new product category labels (e.g., we described a clock made by reusing a hubcap as: “old product – hubcap”; “new product – clock”). To avoid potential demand artifacts and common-method bias, we adopted a multi-informant approach. We randomly assigned participants to one of three conditions; in each condition they were asked to rate the products on different variables. In one condition, participants rated the *appeal* of the upcycled products on a 5-point star liking scale (1 = low rating, 5 = high rating; $M = 3.63$, $SD = 0.40$). In a second condition, participants rated the *perceived creativity* of the upcycled products (“To what extent is the [new product] innovative?”; 1 = “not innovative at all”, 5 = “very innovative”; “To what extent is the [new product] original?”; 1 = “not original at all”, 5 = “very original”; $\alpha = .92$; $M = 3.66$, $SD = 0.35$). In a third condition, participants rated the *dissimilarity between the old and new product* (we reverse coded the responses to two items “To what extent is a [old product] similar to a [new product]?”; “To what extent is the function of a [old product] similar to the function of a [new product]?”; 1 = “very dissimilar”, 5 = “very similar”; $\alpha = .96$; reverse-coded: $M = 2.93$, $SD = 0.65$). Thus, the ratings on the three variables stem from different participants, which addresses common-method bias concerns. We aggregated the data per product (about twenty ratings per product), which resulted in 200 observations and examined the relationships between dissimilarity, creativity and appeal at the product level, rather than at the participant level.

Results and Discussion

The perceived creativity of upcycled products is significantly and positively related to the dissimilarity between the old and new product ($r = .49, p < .001$; see Figure 8) and to the appeal of upcycled products ($r = .30, p < .001$). Moreover, the dissimilarity between the old and new product is significantly and positively related to the appeal of upcycled products ($r = .15, p = .039$). We conducted regression analyses and tested whether perceived creativity mediates the relationship between dissimilarity and appeal. A mediation analysis (5,000 bootstrap samples, bias-corrected) confirms that the relationship between dissimilarity and appeal is mediated by perceived creativity ($b = .09, SE = .02, 95\% CI: [.05, .14]$).

Figure 8 - Relation Between Perceived Creativity and Dissimilarity in Study 1



Notes: Linear regression line resulting from the significant linear regression of dissimilarity on perceived creativity ($p < .001$); $R^2 = .238$.

Across 200 different upcycled products that vary in numerous ways, such as the nature of the upcycled product (from diapers to bird feeders), the nature of the old product (from Nespresso capsules to vinyl records) and the dissimilarity between the upcycled and old product (from book cover to tablet cover and from a fire hose to a shaving kit), we provide initial support for H_{1a} depicted in the conceptual framework (see Figure 7), using actual products sold on an online platform. In the next studies, we seek to experimentally validate these results and identify causal relationships between dissimilarity, creativity, and appeal.

4.2.2 Study 2A: Mediating Role of Perceived Creativity

In study 2A, we aim to experimentally test the observed relationship between the dissimilarity, perceived creativity and appeal of the upcycled product documented in study 1. Whereas study 1 examined naturally occurring variations in dissimilarity across real upcycled products from different product categories, the experimental design in study 2A tests the causal relationships in a more controlled setting and enables us to isolate the causal effect of function dissimilarity between the old and new product. We predict that, while keeping constant all features of the upcycled product (i.e., the usefulness, category, design, sustainability and old product's appeal), perceived creativity should mediate the effect of dissimilarity on product appeal (H_{1a}).

Methods

Three hundred and sixty-three participants ($M_{age} = 35.50$, 50% female, MTurk) took part in an experiment using a 3 (function dissimilarity: high, low, control; between-participants) x 3 (product replicates: side table, key ring, pendant lamp; within-participants) mixed model design. We exposed participants to identical pictures of each replicate across the three conditions. Each product replicate was randomly sampled from one of the three dissimilarity conditions: in the high dissimilarity condition, the product was described as made out of an old product with a dissimilar function (e.g., a side table made with pieces of wood taken from a whiskey barrel); in the low dissimilarity condition, the product was described as made out of an old product with a less dissimilar function (e.g., a side table made with pieces of wood taken from an old side table); in the control condition, the product was described as a basic product (e.g., a side table made with pieces of wood) (see Appendix F).

A pre-test confirms that the dissimilarity between the function of the old versus new product is significantly higher in the high dissimilarity condition than in the low dissimilarity condition across all the replicates ($p < .001$). Moreover, the pre-test shows that the old products used in the high dissimilarity condition are not more attractive than those in the low dissimilarity condition (i.e., consumer attitudes, appeal and coolness; side table: $p = .809$; key ring: $p = .971$; pendant lamp: $p = .570$) (see Appendix G for details on all pre-tests). Hence, any differences observed in the main study cannot be attributed to differences in the attractiveness of the old products used.

Participants rated the appeal and the perceived creativity of the upcycled product on the same scales as in study 1 (perceived creativity: $r = .74$, $p < .001$). The order of the questions was randomized in order to avoid order effect biases.

Results and Discussion

A mixed model ANOVA on appeal reveals a significant effect of function dissimilarity on the product's appeal ($F(2, 360) = 5.47$, $p = .005$, $\eta^2 = .03$; see Table 10). Specifically, participants rated the upcycled products in the high dissimilarity condition significantly higher in terms of appeal than in the low dissimilarity condition ($M_{\text{High}} = 3.59$, $SD = .78$ vs. $M_{\text{Low}} = 3.28$, $SD = .72$, $F(1, 241) = 10.32$, $p = .001$, $\eta^2 = .04$) and in the control condition ($M_{\text{High}} = 3.59$, $SD = .78$ vs. $M_{\text{Control}} = 3.35$, $SD = .81$, $F(1, 240) = 5.80$, $p = .017$, $\eta^2 = .02$). The low dissimilarity and the control condition do not significantly differ in terms of appeal ($M_{\text{Low}} = 3.28$, $SD = .72$ vs. $M_{\text{Control}} = 3.35$, $SD = .81$, $F(1, 239) = .41$, $p = .521$, $\eta^2 = .00$), which suggests that perceived sustainability is an unlikely explanation for the effect. Moreover, the interaction effect between dissimilarity and product replicates is not significant ($F(2, 358) = 1.12$, $p = .327$, $\eta^2 = .01$), which indicates that the observed effects are robust across product replicates.

A second mixed model ANOVA on perceived creativity reveals, consistent with our expectations, that dissimilarity has a positive significant effect on perceived creativity ($F(2, 360) = 13.46, p < .001, \eta^2 = .07$; see Table 10). Participants in the high dissimilarity condition perceived the upcycled products as more creative than those in the low dissimilarity condition ($M_{\text{High}} = 3.71, SD = .97$ vs. $M_{\text{Low}} = 3.18, SD = .96, F(1, 241) = 18.43, p < .001, \eta^2 = .07$) and in the control condition ($M_{\text{High}} = 3.71, SD = .97$ vs. $M_{\text{Control}} = 3.13, SD = .99, F(1, 240) = 21.68, p < .001, \eta^2 = .08$). There was no significant difference between the low dissimilarity and the control condition in terms of perceived creativity ($M_{\text{Low}} = 3.18, SD = .96$ vs. $M_{\text{Control}} = 3.13, SD = .99, F(1, 239) = .19, p = .661, \eta^2 = .00$). Again, the interaction between dissimilarity and replicates proved not significant ($F(2, 358) = 1.53, p = .218, \eta^2 = .01$), suggesting the observed effects are robust across replicates.

Table 10 - Appeal and Perceived Creativity Means (and SD) per Product in Study 2A

Product	Control		Low dissimilarity		High dissimilarity	
	Appeal	Creativity	Appeal	Creativity	Appeal	Creativity
Side Table	3.70 (.89)	3.31 (1.03)	3.51 (.84)	3.24 (.97)	3.91 (.93)	3.86 (.94)
Lamp	3.16 (1.01)	3.26 (.98)	3.20 (1.06)	3.43 (1.03)	3.48 (1.02)	3.75 (.98)
Key Ring	3.18 (1.16)	2.80 (1.17)	3.12 (1.08)	2.84 (1.11)	3.38 (1.15)	3.51 (1.20)
Overall	3.35 (.81)	3.13 (.99)	3.28 (.72)	3.18 (.96)	3.59 (.78)	3.71 (.97)

Notes: All means in the high dissimilarity condition are significantly higher than those in the low dissimilarity condition and than those in the control condition. All means in the low dissimilarity condition are not significantly different from the means in the control condition.

Finally, a mediation analysis (5,000 bootstrap samples, bias-corrected) with dissimilarity as the independent variable, creativity as the mediator, and appeal as the dependent variable confirmed that the effect of dissimilarity on the appeal of upcycled products is mediated by perceived product creativity ($b = .17, SE = .04, 95\% \text{ CI: } [.09, .24]$). These results are consistent if we run mediation analyses separately for the low dissimilarity condition and the control condition ($b = .16, SE = .04, 95\% \text{ CI: } [.09, .24]$; $b = .19, SE = .04, 95\% \text{ CI: } [.11, .28]$).

Taken together, these results indicate that higher dissimilarity between the old and the upcycled product increases the perceived creativity of the upcycled product, which in turn increases the appeal of the upcycled product.

4.2.3 Study 2B: The Aha!-Experience

In study 2B, we aim to provide additional insights regarding the aha!-experience as an antecedent of perceived creativity and test our predicted causal chain in greater detail. Specifically, we test whether the aha!-experience, triggered by the realization that functional fixedness is overcome, explains why higher function dissimilarity increases perceived creativity and enhances product appeal (H1_b).

Methods

Two hundred forty-two participants ($M_{\text{age}} = 35.81$, 42% female, MTurk) took part in a between-participants design experiment with two conditions (function dissimilarity: high, low). First, participants saw the picture of a side table which was described as being made reusing components of an old product, without disclosing the nature of the old product. Then, participants were informed that the table was made reusing components of a whiskey barrel (high dissimilarity condition) or of another side table (low dissimilarity condition). A pre-test confirms that participants rated the dissimilarity between the functions of the old and new product as significantly higher in the high dissimilarity condition than in the low dissimilarity condition ($p < .001$). Moreover, the pre-test shows that the old product in the high dissimilarity condition does not differ in terms of attractiveness (i.e., consumer attitude, appeal and coolness) compared to the old product in the low dissimilarity condition ($p = .891$). Hence, any differences observed in the main study cannot be attributed to differences in the attractiveness of the old products used.

Next, participants indicated to what extent they experienced an aha!-moment captured by the following four items presented in a random order: “Learning about this product gave me a novel insight”, “Learning about this product made me feel like I solved a puzzle”, “Learning about this product gave me an aha!-moment”, “Learning about this product made me feel surprised” (1 = “strongly disagree”, 5 = “strongly agree”; $\alpha = .89$). These items capture the main content of the aha!-experience construct, which refers to having an insight and a sudden realization of having a solution to a problem that comes with a sense of surprise (Lehrer 2008; Topolinski and Reber 2010). Finally, participants rated perceived creativity as measured in the previous studies ($r = .75$) and rated product appeal on a 5-point scale (1 = “not appealing at all”; 5 = “very appealing”). The order of the questions was randomized in order to avoid order effect biases.

Results and Discussion

Two ANOVAs, one with appeal and one with creativity as the dependent variables, revealed a significant effect of function dissimilarity on the product’s appeal ($F(1, 240) = 5.06, p = .025, \eta^2 = .02$) and on the product’s perceived creativity ($F(1, 240) = 18.81, p < .001, \eta^2 = .07$). Participants rated the table in the high dissimilarity condition as significantly more appealing ($M_{\text{High}} = 4.10, SD = 1.04$ vs. $M_{\text{Low}} = 3.81, SD = .96$) and more creative ($M_{\text{High}} = 4.18, SD = .85$ vs. $M_{\text{Low}} = 3.65, SD = 1.03$) than in in the low dissimilarity condition.

Another ANOVA with the aha!-experience measure as the dependent variable revealed that consumers reported a significantly stronger aha!-experience when the function of the old product was more (vs. less) dissimilar ($M_{\text{High}} = 3.45, SD = 1.04$ vs. $M_{\text{Low}} = 3.12, SD = 1.11, F(1, 240) = 5.75, p = .017, \eta^2 = .02$). A sequential mediation analysis (5,000 bootstrap samples, bias-corrected), with dissimilarity as the independent variable, aha!-experience as the first mediator, perceived creativity as the second mediator, and appeal as the dependent variable, shows a significant sequential pathway from dissimilarity, to aha!-

experience, to creativity, to product appeal ($b = .17$, $SE = .04$, 95% CI: [.09, .26]) (see Appendix H for details). In line with our theorizing, these results suggest that the aha!-experience, triggered by the realization that functional fixedness has been overcome, explains why higher dissimilarity increases perceived creativity and enhances product appeal.

4.2.4 Study 3: Demand for Upcycled Products

In studies 2A and 2B we documented that function dissimilarity affects the perceived appeal of upcycled products because of perceived creativity. In study 3, we focus on the main effect of dissimilarity on appeal and we aim to test whether function dissimilarity between the old and new product also affects the appeal of upcycled products using a consequential measure of product appeal.

Methods

We purchased 130 upcycled keychains, hand-made reusing the fabric from parachutes on Etsy.com. Half of the keychains were red and blue, and the other half were blue and turquoise. We set up a small pop-up sales booth on a university campus to sell the keychains. Participants could purchase a keychain for €1 and they were truthfully told that all the money collected would be donated to UNICEF to help children in need. Participants could choose between two different types of keychains. We conducted a within-participants design with two conditions (function dissimilarity: high, low) by describing half of the keychains as being made “repurposing the fabric of parachutes” (high dissimilarity) and the other half as being made “repurposing the fabric of other keychains” (low dissimilarity) (see Appendix F). We packaged the keychains into small paper bags to make the differentiation between conditions more convincing. For the entire duration of the study, we always displayed ten keychains at our sales booth: five keychains from the high dissimilarity condition and five keychains from

the low dissimilarity condition. We replaced every keychain that was sold with another keychain from the same condition to ensure that the same number of keychains per condition were available at all times (and to thus avoid scarcity effects; e.g., Mittone and Savadori 2009). We stopped collecting data once all the 120 keychains were sold. We had nine additional keychains that were left on the sales booth table which were not sold in order to always display the same number of products on the table. We counterbalanced the colors across the study.

A pre-test confirms that the dissimilarity between the old and new product is significantly higher in the high dissimilarity condition than in the low dissimilarity condition ($p < .001$). Moreover, the pre-test shows that participants did not rate the old product in the high and low dissimilarity conditions differently in terms of attractiveness (i.e., consumer attitude, appeal and coolness; $p = .864$). Hence, any differences observed in the main study cannot be attributed to differences in the attractiveness of the old products used.

The booth was open for two days. Study participants were all the persons who stopped at the sales booth to purchase a keychain. While the selling price was displayed as €1, participants could also donate a greater amount if they wanted to. A research assistant blind to the research hypotheses approached people to invite them to buy a keychain and he asked people to choose between a “keychain made reusing the fabric of parachutes” or a “keychain made reusing the fabric of other keychains.” One member of the research team recorded information about the purchase (e.g., keychain type, keychain color, time, additional information).

Results and Discussion

A two-proportions z -test shows that participants were significantly more likely to purchase a keychain made out of an old product with a dissimilar function than one made out of an old product with a similar function ($z = 4.02, p < .001$). Specifically, we sold 82

keychains from the high dissimilarity condition (i.e., keychains made repurposing the fabric of parachutes) and 38 keychains from the low dissimilarity condition (i.e., keychains made repurposing the fabric of other keychains). We raised €148.16 in total, and we donated the whole amount to UNICEF.

The previous studies show that the positive effect of function dissimilarity on product appeal is due to enhanced creativity perceptions. Yet, studies 1, 2A and 2B also seem to suggest that the relation between function dissimilarity and creativity is stronger than the relation between function dissimilarity and appeal (comparison relation dissimilarity-creativity vs. dissimilarity-appeal in study 1: $r = .49$ vs. $r = .15$, $z = 3.84$, $p < .001$; in study 2A: $r = .26$ vs. $r = .17$, $z = 1.32$, $p = .093$; in study 2B: $r = .27$ vs. $r = .14$, $z = 1.44$, $p = .075$). This potentially indicates that creativity triggered by function dissimilarity is not necessarily valued by consumers. In the next three studies (4A, 4B and 5), we test when the effect of function dissimilarity on an upcycled product's perceived creativity is less likely to translate into a higher product appeal. We expect that dissimilarity would typically increase creativity, but that not all consumers would value creativity.

4.2.5 Study 4A: Moderation of Consumers' Openness to Experience

In study 4A, we test whether the effect of function dissimilarity on appeal is moderated by consumers' openness to experience. If perceived creativity underlies the effect of function dissimilarity on a product's appeal, as hypothesized, we expect the effect of function dissimilarity on the appeal of upcycled products to be attenuated when consumers are characterized by low levels of openness to experience (H_2). Prior research suggests that openness to experience predicts whether creative ideas, such as art, music or literature, are appreciated (John and Srivastava 1999). Although all consumers, regardless of openness to experience, should generally perceive an upcycled product made out of an old product with a

dissimilar function as creative, we expect that consumers who are less open to experience would appreciate its creativity to a lesser extent. For these consumers, we expect that product appeal would be less dependent on perceived creativity.

Methods

Two hundred twenty-four participants ($M_{\text{age}} = 35.14$, 60% female) took part in a 3 (function dissimilarity: high, low, control; between-participants) x 4 (product replicates: bag, table, lamp, shelf; within-participants) mixed design experiment using convenience sampling. We exposed participants to a picture and a short description of the four product replicates in a random order from one of three conditions randomly assigned between-participants: high dissimilarity—product described as made out of an old product with a dissimilar function (e.g., a bag made from reclaimed truck canvas and seatbelts); low dissimilarity—product described as made out of an old product with a similar function (e.g., a bag made from reclaimed canvas bags); or control—no description. The product picture was the same for each replicate across conditions (see Appendix F) and we included two filler non-upcycled product replicates in a random order. Participants rated product appeal on a 5-point scale (1 = “poor”, 5 = “excellent”). A pre-test confirms that across all replicates, the dissimilarity between the functions of the old and new products is significantly higher in the high dissimilarity condition than in the low dissimilarity condition ($p < .001$). Moreover, the pre-test shows that for one product replicate (table), the old products in the high dissimilarity versus those in the low dissimilarity condition do not differ in terms of attractiveness (i.e., consumer attitude, appeal and coolness; $p = .334$), whereas for the other three product replicates (bag, lamp and shelves), participants rated the old products in the high dissimilarity condition as significantly less attractive than the old products in the low dissimilarity condition (bag: $p < .001$; lamp: $p = .002$; shelves: $p < .001$). Hence, any differences observed in the main study cannot be attributed to the attractiveness of the old products used.

At the end of the product rating section, participants filled out the Openness to Experience (O_tE) scale (John and Srivastava 1999). Specifically, participants were asked to agree or disagree (1 = “strongly disagree”; 7 = “strongly agree”) on ten items to self-assess their own openness to experience ($\alpha = .76$): the items measure intellectual curiosity (e.g., “I see myself as someone who is curious about many different things”), imagination (e.g., “I see myself as someone who has an active imagination”), aesthetics sensitivity (e.g., “I see myself as someone who values artistic, aesthetics experiences), preference for variety (e.g., “I see myself as someone who likes work that is routine”—*reverse coded*) and attentiveness to inner feelings (e.g., “I see myself as someone who likes to reflect, play with ideas”). Overall, participants scored relatively high on the openness to experience scale ($M = 5.01$, $SD = .75$, $\min = 2$, $\max = 7$) and there is no significant difference in openness to experience ratings across conditions ($M_{\text{High}} = 4.93$, $SD_{\text{High}} = .75$; $M_{\text{Low}} = 5.09$, $SD_{\text{Low}} = .82$; $M_{\text{Control}} = 5.02$, $SD_{\text{Control}} = .66$; $F(2, 223) = .89$, $p = .412$).

Results and Discussion

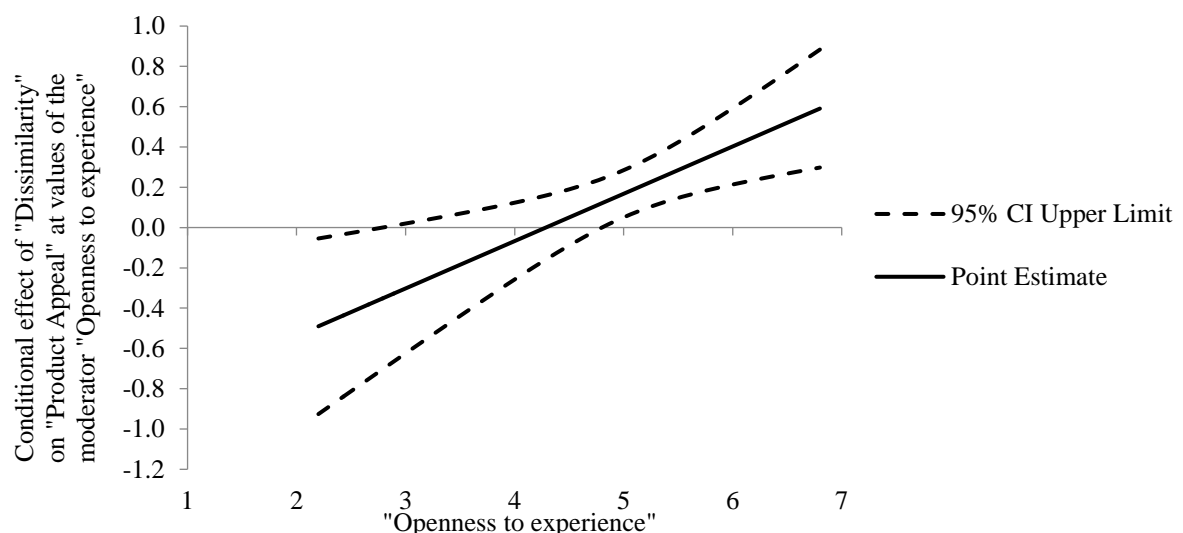
A mixed model ANOVA with appeal as the dependent variable shows that dissimilarity has a significant effect on appeal ($F(2, 221) = 6.32$, $p = .002$, $\eta^2 = .05$). Specifically, participants rated the products in the high dissimilarity condition significantly higher than in the low dissimilarity condition ($M_{\text{High}} = 3.79$, $SD = .71$ vs. $M_{\text{Control}} = 3.47$, $SD = .84$, $F(1, 150) = 6.59$, $p = .011$, $\eta^2 = .04$) and significantly higher than in the control condition ($M_{\text{High}} = 3.79$, $SD = .71$ vs. $M_{\text{Control}} = 3.39$, $SD = .65$, $F(1, 145) = 13.17$, $p < .001$, $\eta^2 = .08$). There is no significant difference between the low dissimilarity and the control condition ($M_{\text{Low}} = 3.47$, $SD = .84$ vs. $M_{\text{Control}} = 3.39$, $SD = .65$, $F(1, 147) = .48$, $p = .490$, $\eta^2 = .00$), which renders a sustainability explanation unlikely. The effect holds across replicates; the interaction dissimilarity x replicates is not significant ($F(2, 221) = 1.47$, $p = .233$, $\eta^2 = .01$; see Table 11).

Table 11 - Appeal Means (and SD) per Product in Study 3A

Product	Control	Low Dissimilarity	High Dissimilarity
Bag	2.67 (1.06)	2.73 (1.19)	3.19 (1.18)
Table	3.44 (1.07)	3.57 (1.15)	3.85 (.88)
Lamp	3.49 (1.04)	3.65 (1.16)	4.11 (.95)
Shelf	3.94 (.95)	3.94 (1.19)	4.03 (.99)
Overall	3.39 (.65)	3.47 (.84)	3.79 (.71)

Notes: All means in the high dissimilarity condition are significantly higher than those in the low dissimilarity condition and than those in the control condition except for the shelf. All means in the low dissimilarity condition are not significantly different than the means in the control condition.

A moderation analysis (5,000 bootstrap samples, bias-corrected) revealed that the effect of the dissimilarity on the appeal of upcycled products is moderated by openness to experience ($b = .24$, $SE = .08$, 95% CI: [.09, .39]). Specifically, a floodlight analysis with the Johnson-Neyman technique revealed two turning points of the effect of dissimilarity on appeal. Consumers with a low openness to experience score ($M_{OIE} \leq 2.66$) find the upcycled product made out of an old product with a less dissimilar function more appealing than the upcycled product made out of an old product with a more dissimilar function. For consumers with moderate values on the openness to experience scale ($2.66 < M_{OIE} < 4.80$), there is no effect of dissimilarity on appeal. Consumers with a high openness to experience score ($M_{OIE} \geq 4.80$) find the upcycled product made out of an old product with a more dissimilar function more appealing than the upcycled product made out of an old product with a less dissimilar function (see Figure 9).

Figure 9 - Plot of Floodlight Analysis in Study 4A

Finally, these results are consistent regardless of whether we use the low dissimilarity condition or the control condition as the benchmark ($b = .26$, $SE = .08$, 95% CI: [.11, .41]; $b = .34$, $SE = .07$, 95% CI: [.20, .49]).

4.2.6 Study 4B: Moderation of Consumers' Openness to Experience in a Gift-Giving Context

In study 4A, we found that the effect of dissimilarity on appeal is moderated by the extent to which consumers are open to experience, which was measured as a personality characteristic. In study 4B, we aim to provide further evidence for moderation by manipulating openness to experience. Because it is notoriously difficult to manipulate an individual's personality, we test our conceptual framework in a gift-giving context and manipulate the personality trait of the receiver of the gift. We predict that gift givers would be less likely to purchase upcycled products for gift receivers characterized by low levels of openness to experience, especially if the upcycled product is made out of components from products serving a dissimilar (vs. similar) function.

Methods

We randomly assigned 484 participants ($M_{age} = 39.89$, 54% female, MTurk) to one condition of a 2 (openness to experience: high, low) x 2 (function dissimilarity: high, low) between-participants design experiment. First, participants read a short description of a friend who was presented as being high or low in openness to experience. The descriptions contained personality characteristics that reflect openness to experience (John and Srivastava 1999). In the *high openness to experience* conditions, the friend was described as a person who likes variety in day-to-day life, craves novelty, is willing to try out new activities, values novel and innovative ideas and situations, and tends to be intellectually curious and imaginative in outlook and behavior. In the *low openness to experience* conditions, the friend

was described as a person who is very resistant to new experiences, seeks refuge in familiar surroundings and in the ‘tried-and-tested’ predictability of traditions, prefers habitual situations and routines, gains comfort from the familiarity of his own usual environment, and tends to be conventional and traditional in outlook and behavior. Then, participants were shown pictures of two side tables and indicated which product they would buy for their friend. In the high dissimilarity conditions, one table was upcycled and described as made out of a product with a dissimilar function (i.e., a table made with pieces of wood taken from a whiskey barrel), the other table was a non-upcycled product (i.e., a table made with pieces of wood). In the low dissimilarity conditions, one table was upcycled and described as made out of a product with a less dissimilar function (i.e., a table made with pieces of wood taken from another side table), the other table was non-upcycled (i.e., a table made with pieces of wood) (see Appendix F).

A pre-test confirmed that participants rated the dissimilarity between the functions of the old and new product as significantly higher in the high dissimilarity condition than in the low dissimilarity condition ($p < .001$). Moreover, the pre-test showed that the old product in the high dissimilarity condition versus the old product in the low dissimilarity condition does not differ in terms of attractiveness (i.e., consumer attitude, appeal and coolness; $p = .891$). Hence, any differences observed in the main study may not be attributed to differences in the attractiveness of the old products used.

As a measure of product appeal, we asked participants to indicate on a 5-point scale which of the two products they would buy as a gift for the described friend (1 = the non-upcycled product, 5 = the upcycled product); we also asked participants which of the two products is more creative (i.e., original and more innovative, $r = .53$; 1 = the non-upcycled product, 5 = the upcycled product). Finally, as a manipulation, we asked participants to rate the described friend on the openness to experience scale.

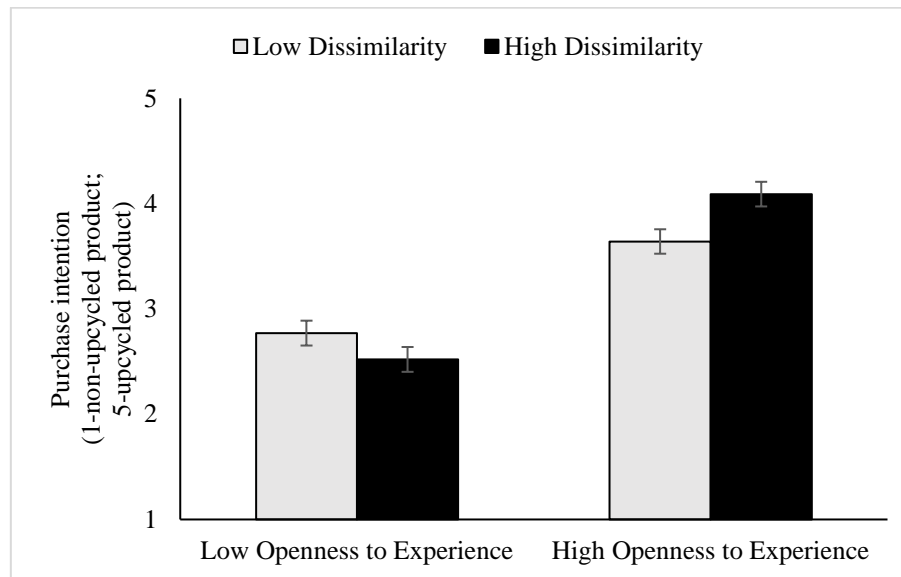
Results and Discussion

Manipulation check. To test whether our manipulation of openness to experience was effective, we first ran a 2 x 2 ANOVA of the two factors on the openness to experience scale. As expected, participants in the high openness to experience condition rated the imaginary friend higher on the openness to experience scale than those in the low openness to experience condition ($M_{\text{HighOIE}} = 4.11$ vs. $M_{\text{LowOIE}} = 2.66$, $F(1, 483) = 596.28$, $p < .001$, $\eta^2 = .55$). These results confirm that our manipulation was effective.

Product appeal. A 2 x 2 ANOVA on product appeal shows a significant function dissimilarity x openness to experience interaction ($F(1, 481) = 8.86$, $p = .003$, $\eta^2 = .02$), suggesting that openness to experience moderates the effect of function dissimilarity on the upcycled product appeal (see Figure 10). Participants in the high openness to experience condition indicated significantly higher appeal for the upcycled product over the non-upcycled product when the dissimilarity between the functions of the old and new product was high (vs. low) ($M_{\text{High}} = 4.09$, $SD = 1.23$ vs. $M_{\text{Low}} = 3.64$, $SD = 1.34$, $F(1, 481) = 7.37$, $p = .007$, $\eta^2 = .02$). Participants in the low openness to experience condition indicated no difference in product appeal due to function dissimilarity ($M_{\text{High}} = 2.52$, $SD = 1.27$ vs. $M_{\text{Low}} = 2.77$, $SD = 1.32$, $F(1, 481) = 2.25$, $p = .134$, $\eta^2 = .01$). In addition, whereas participants in the high openness to experience condition preferred the upcycled product over the non-upcycled one regardless of function dissimilarity (comparison with scale mid-point: $M = 3.87$, $SD = 1.30$, $t(244) = 10.39$, $p < .001$), participants in the low openness to experience condition preferred the non-upcycled product over the upcycled one regardless of function dissimilarity (comparison with scale mid-point: $M = 2.64$, $SD = 1.30$, $t(239) = -4.27$, $p < .001$). This may suggest that in a gift-giving context, an upcycled product is already considered as a more creative gift than a non-upcycled product. As expected, participants rated the upcycled product as more creative when made out of an old product with a dissimilar (vs. similar) function condition ($M_{\text{High}} = 4.00$ vs. $M_{\text{Low}} = 3.59$; $F(1, 481) = 16.25$, $p < .001$, $\eta^2 = .03$),

regardless of whether the product was purchased for a friend with high or low levels of openness to experience (the function dissimilarity x openness to experience interaction was not significant: $F(1, 481) = .01, p = .938, \eta^2 = .00$).

Figure 10 - Appeal Between an Upcycled and a Non-Upcycled Product in Study 4B



Notes: Bars indicate SE.

4.2.7 Study 5: Moderation of Consumers' Purchase Motives

In study 5, we test whether functional versus experiential purchase motives would moderate the effect of function dissimilarity on upcycled products' appeal. Specifically, we predict that when consumers purchase a product mainly for functional (vs. experiential) motives (Holbrook and Hirschman 1982), the positive effect of function dissimilarity on the upcycled products' appeal would attenuate (H_3). While consumers would perceive upcycled products made out of old products with dissimilar (vs. similar) functions as creative—regardless of purchase motives—we posit that, when functionality considerations motivate the purchase process, enhanced creativity perceptions would be less likely to translate into enhanced product appeal.

Methods

We randomly assigned 487 participants ($M_{\text{age}} = 38.40$, 51% female, MTurk) to one condition of a 2 (function dissimilarity: high, low) x 2 (purchase motives: functional, experiential) between-participants design experiment. As in study 4B, we asked participants to choose a product in a gift-giving context, because we assumed that individuals may be biased by their own purchase motives. They first read a short description of a lamp that a friend would like to receive as a gift. In the *functional* conditions, the friend was described as wanting a functional and practical lamp that can light his living room and give him a great performance. In the *experiential* conditions, the friend was described as wanting a fun and enjoyable lamp that can decorate his living room and provide a great experience. We then showed pictures of two lamps with a short description and we asked participants to choose one of the lamps as a gift. In the *high dissimilarity* conditions, one lamp was upcycled and described as made out of an old product with a more dissimilar function (i.e., a lamp made reusing the horns from old gramophones), the other lamp was non-upcycled (i.e., a lamp made of aluminum). In the *low dissimilarity* conditions, one lamp was upcycled and described as made out of an old product with a less dissimilar function (i.e., a lamp made reusing the shades of other old hanging lamps), the other lamp was described as non-upcycled (i.e., a lamp made of aluminum) (see Appendix F).

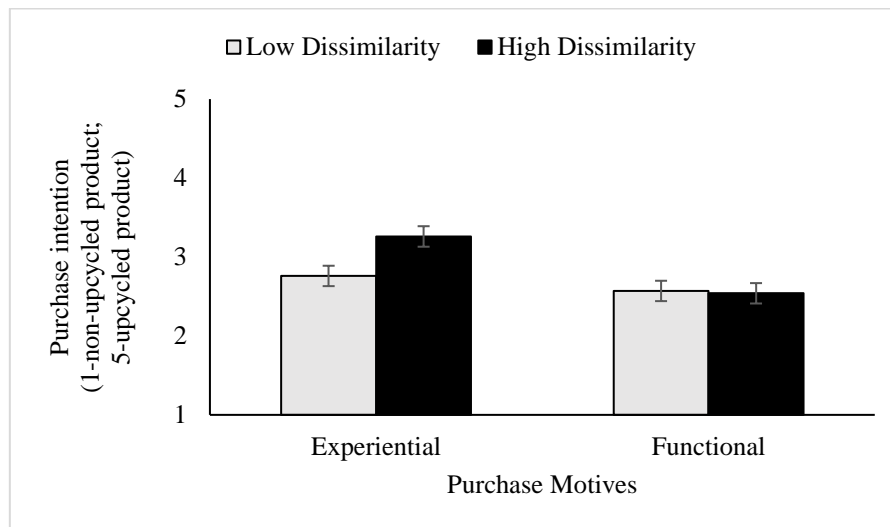
A pre-test confirms that the function dissimilarity between the old and new product is significantly higher in the high dissimilarity condition than in the low dissimilarity condition ($p < .001$). Moreover, the pre-test shows that the old product in the high dissimilarity condition did not differ in terms of attractiveness (i.e., consumer attitude, appeal and coolness) from the old product in the low dissimilarity condition ($p = .406$). Hence, any differences observed in the main study cannot be attributed to differences in the attractiveness of the old products used.

As a measure of product appeal, we then asked participants to indicate which of the two products they would buy as a gift to the described friend (1 = the non-upcycled product, 5 = the upcycled product). Finally, participants indicated on the same creativity scale as before which of the two lamps is more creative ($r = .52, p < .001$; 1 = the non-upcycled product, 5 = the upcycled product).

Results and Discussion

A 2 x 2 ANOVA on product appeal shows a marginally significant effect of function dissimilarity ($M_{\text{High}} = 2.90, SD = 1.45$ vs. $M_{\text{Low}} = 2.66, SD = 1.45, F(1, 483) = 3.40, p = .066, \eta^2 = .01$), a significant effect of purchase motives ($M_{\text{Exp}} = 3.01, SD = 1.49$ vs. $M_{\text{Fun}} = 2.55, SD = 1.39, F(1, 483) = 12.63, p < .001, \eta^2 = .03$) and a significant function dissimilarity x purchase motives interaction ($F(1, 483) = 4.14, p = .042, \eta^2 = .01$). Specifically, the dissimilarity between the functions of the old and new product only has a positive effect on product appeal when experiential motives guide the decision process ($M_{\text{ExpHigh}} = 3.26, SD = 1.40$ vs. $M_{\text{ExpLow}} = 2.76, SD = 1.54, F(1, 483) = 7.51, p = .006, \eta^2 = .02$). The positive effect of function dissimilarity on purchase intention vanishes when functional motives guide the purchase process ($M_{\text{FunHigh}} = 2.54, SD = 1.42$ vs. $M_{\text{FunLow}} = 2.57, SD = 1.36, F(1, 483) = .02, p = .893, \eta^2 = .00$). Put differently, within the high dissimilarity conditions, participants preferred the upcycled over the non-upcycled product when experiential considerations motivated the decision process ($M_{\text{ExpHigh}} = 3.26$ vs. $M_{\text{FunHigh}} = 2.54, F(1, 483) = 15.58, p < .001, \eta^2 = .03$; see Figure 11).

Figure 11 - Appeal Between an Upcycled and a Non-Upcycled Product in Study 5



Notes: Bars indicate SE.

The same ANOVA on creativity reveals a significant main effect of function dissimilarity on creativity ($F(1, 483) = 6.41, p = .012, \eta^2 = .01$); participants perceived the upcycled product as more creative in the high dissimilarity than in the low dissimilarity condition ($M_{\text{High}} = 3.88, SD = 1.16$ vs. $M_{\text{Low}} = 3.61, SD = 1.19$). As expected, all other effects were not significant (consumer purchase motives: $F(1, 483) = 2.01, p = .157, \eta^2 = .00$; interaction dissimilarity x purchase motives: $F(1, 483) = .86, p = .355, \eta^2 = .00$). These results suggest that upcycled products made out of an old product with a dissimilar (vs. similar) function are perceived as more creative regardless of functional or experiential purchase motives.

Finally, a moderated mediation analysis (5,000 bootstrap samples, bias-corrected) with consumers' purchase motives as moderator and creativity as mediator reveals that the effect of dissimilarity on appeal is moderated by consumers' purchase motives ($b = -.04, SE = .02, 95\% \text{ CI: } [-.08, -.01]$). Specifically, the positive effect of dissimilarity on creativity does not translate into an increase in product appeal when functional motives underlie consumers' purchase decisions. In sum, consumers perceive upcycled products as more creative when function dissimilarity is high, regardless of their purchase motives. However, this enhanced

creativity does not increase product appeal when functional considerations guide the purchase process.

4.3 General Discussion

The excessive exploitation of resources and their limited availability has pushed companies to identify solutions for efficiently reusing existing resources to create products. Upcycling involves the reuse of components from old, used or unwanted products to create new ones. While the spread of upcycled products has recently grown (e.g., Petro 2019), it is not a new phenomenon—building new products from old components was a common practice for many of our ancestors who had limited access to raw materials or could not afford them. Moreover, in many developing countries, where new raw materials are not available or too expensive, upcycling is a common practice. For example, the lack of resources due to poverty and commercial isolation led the Cuban population to improvise: products such as fans and TV antennas were repaired using old vinyl records and aluminum food trays (Motherboard 2013). Yet, upcycling has recently spread in developed countries, where resources are more available, but where sustainability and ecological concerns may be more prominent.

The aim of this research was to examine when and why upcycled products are appealing. Specifically, we find that consumers perceive upcycled products as more appealing when they are made of components that used to serve a different function than the new upcycled products. Thus, dissimilarity in the functions does not reduce the appeal of upcycled products but rather increases their appeal. Our studies show that function dissimilarity triggers an aha!-experience—consumers realize that old products can be used differently and so break functional fixedness—which makes these products appear more creative and increases their appeal. We have documented these relationships using a correlational approach with 200 different products varying across numerous dimensions, but also using a tightly controlled

experimental approach with consequential measures. Notably, we have shown that enhanced perceptions of creativity may not necessarily stimulate demand for upcycled products, as it depends on consumer characteristics and consumer motives: product creativity does not translate into increased appeal when consumers are less open to experience and when functional (vs. experiential) motives guide the purchase process.

4.3.1 Theoretical and Substantive Implications

This research contributes to the literature in several ways. First, while previous research has proposed that the appeal of upcycled products is driven by sustainability perceptions (Frank 2013; McDonough and Braungart 2002; Szaky 2014; Wilson 2016), we show that perceived creativity explains much of their appeal as well. This focus on perceived creativity has the advantage that it not only explains why upcycled products are more appealing than non-upcycled products, but also why some upcycled products are more appealing than others (i.e., it makes it possible to explain differences within the category of upcycled products). Moreover, whereas previous research on upcycling has advanced knowledge on how to best *promote* upcycled products (Kamleitner, Thürndl, and Martin 2019), our research helps understand how to best *design* upcycled products. In addition, we also contribute to the sustainability literature which has thus far mainly focused on practices that incentivize individuals to consume in a sustainable manner (Lord 1994; Trudel and Argo 2013; Trudel, Argo, and Meng 2016; White, MacDonnell, and Dahl 2011). Consistent with the proposition that sustainability is not just the responsibility of consumers, we identify a new way for producers to create value by reusing existing resources without using new ones.

Second, our research contributes to the creativity literature by providing new insights into the antecedents of perceived creativity. This research demonstrates that creativity perceptions increase when consumers realize that product components can serve functions

that are different from their original functions (i.e., overcoming functional fixedness). While the existence of aha!-experiences have been documented among inventors or product designers in problem-solving contexts (cf. Lehrer 2008; Schilling 2005; Tik et al. 2018), we show that such an aha!-experience can also materialize among people (consumers) who are not actively engaged in problem-solving processes. At the same time, our research might also contribute to explaining why consumers oftentimes find user-generated products appealing (e.g., von Hippel 1988, Schreier, Fuchs, and Dahl 2012). Since users, compared to professional designers, usually do not have the capabilities and resources to customize every component of a product, they often have to rely on components that they have at hand, and use these existing components to create new products. For example, the first snowboards were made of components from other product categories, such as foot bindings from water skis. It is not completely impossible that this original reuse of existing components helped shape the appeal of the newly developed snowboards at that time.

Third, we contribute to another stream of the creativity literature by advancing our understanding of the consumption-relevant consequences of perceived creativity. While creativity is generally believed to result in favorable consequences (e.g., Andrews and Smith 1996; Hennessey and Amabile 2010), our research shows that this is not necessarily the case when it comes to perceptions thereof—the positive effect of perceived creativity on product appeal is *not* universal. Our research therefore offers a more nuanced theoretical perspective on perceived creativity. Our finding that perceived creativity is less effective when consumers are less open to experience can help firms and individual producers to market their upcycled products. While openness to experience is not directly observable, there are several correlates of openness to experience such as age (Costa and McCrae 1976), intelligence (McCrae and Costa 1997), geographical location (Rentfrow, Gosling, and Potter 2008), social desirable responding (Steenkamp, De Jong, and Baumgartner 2010) and political orientation (conservatism vs. liberalism; Klein et al. 2019) that can serve as proxies for customer

segmentation and targeting. Moreover, our finding that perceived creativity is less effective when functional (versus experiential) motives guide the purchase process suggests that creativity cues might be effective for experiential goods but less so for functional ones. This insight also can help upcycled product producers adapt relevant elements of their marketing mix, such as advertising, packaging and purchase/consumption environment, to create experiences for consumers (Schmitt 1999): rather than focusing on a product's functional features and benefits, marketing activities with a focus on emotional arousal, sensory experiences and cognitive involvement can help attract potential consumers of upcycled products by providing them additional experiential value.

4.3.2 Limitations and Opportunities for Future Research

In our research, we tried to isolate one product design characteristic (i.e., function dissimilarity) that affects the appeal of upcycled products. We acknowledge, however, that isolating this factor is empirically challenging—the use of multiple replicates within studies and the consistent patterns across multiple studies gives us confidence in the validity and robustness of our findings. We also acknowledge that this research identified one factor that affects the appeal of upcycled products, but there might be additional ones which could be explored in future studies. For example, consumers may enjoy the vintage, retro or antique appearance of upcycled products (Wilson 2016); consumers may be attracted by the inherent uniqueness of upcycled products (Park and Lin 2018); consumers may assume that upcycled products are cheaper than similar non-upcycled ones, therefore making them more appealing (Sung 2015); and consumers may appreciate the craftsmanship that characterizes upcycled products (Keith and Silies 2015).

Future studies could also examine additional factors that may increase the appeal of upcycled products. For example, the extent to which consumers recognize the function of the

old product may affect the upcycled product's appeal. On the one hand, higher recognizability of the old product may cause the upcycled product to be perceived as more unique, which drives product appeal for many consumers (Tian, Bearden, and Hunter 2001), because the upcycled product would appear visually different from similar non-upcycled products that have the same function. On the other hand, however, higher recognizability may reduce the aha!-experience because the use of an old product with another function is more obvious and easier to detect, and may therefore decrease perceived creativity and product appeal. In addition, higher recognizability may backfire because it would highlight the lack of unity among the elements of the product design (i.e., the visual dissimilarity between different components of the same design), which may negatively affect consumer response (Veryzer and Hutchinson 1998).

Another factor that may affect the appeal within the upcycled product category is the level of decomposition of the old product. For example, would a table made out of an entire whiskey barrel compared to one that only uses the staves of that barrel be equally appealing? We would expect that if the level of decomposition is high, the easier it is to assign a different function to decomposed parts of the old product (McCaffrey 2012). Hence, if a higher level of decomposition makes it possible to overcome functional fixedness more easily, the aha!-experience would be weaker, and therefore consumers would perceive the upcycled products as less creative and appealing.

Finally, further research could broaden our findings in other fields and investigate if the effect of function dissimilarity on the product's appeal also emerges for other practices involving reusing old resources, like recycled products (e.g., would a vase made with glass recycled from old wine bottles be more appealing than a vase made with glass recycled from old vases?), or even non-sustainable products (e.g., would a table intentionally shaped like a whiskey barrel be appealing to consumers?). Future research could explore whether overcoming functional fixedness is a necessary condition for the reported effects.

In sum, we have taken an initial step toward understanding how the design of sustainable products can increase their appeal. These findings can be used to inform product designers with the aim of increasing the reuse of existing resources to create new products that are appealing to consumers.

5 CONCLUSION

A main goal of this dissertation was to extend the existing knowledge on how product design can affect consumers' psychological and behavioral responses.

In the first essay, I identify a novel theoretical account for when and why prominent logos can create value for consumers and brands. In ten studies, I show that consumers have a higher preference for prominent logos in performance (vs. non-performance) product categories and contexts. This is because they expect prominent logos to make them feel competent in activities that require specific skills. The findings show that prominent logos, beyond serving a social signaling function as examined in prior research, can also act as a self-signaling tool that positively affects consumers' self-view by boosting feelings of efficacy. From a substantive point of view, these findings can support product designers in choosing the logo size on products.

In the second essay, I develop a scale that allows classifying products along the previously unexplored performance dimension. The scale development shows that consumers' perceptions of products along the performance dimension can explain consumer behavior, including product design preferences, distinctly from related existing classification schemes based on products' utilitarian versus hedonic characteristics (e.g., Voss, Spangenberg, and Grohmann 2003) and identity-relevant versus irrelevant characteristics (e.g., Berger and Heath 2007). This scale can support researchers to develop a richer understanding of consumers' behavior, and companies to develop more tailored marketing strategies.

In the third essay, I show how objective product characteristics (i.e., function dissimilarity) can contribute to increase the appeal of upcycled products. In seven studies, I show that consumers perceive upcycled products as more appealing when they are made of components that used to serve a different function than the new upcycled products because of higher creativity perception. These findings unearth a novel path how to create value of

existing resources without consuming new ones, and contribute to expand the limited empirical research on upcycled products. From a substantive point of view, these findings can be used to inform product designers to create new products that are appealing to consumers by reusing existing resources.

Taken together, this dissertation advances our understanding of how product design affects consumer behavior. The findings of this dissertation should be taken into account by companies (e.g., to appropriately design products), by marketers (e.g., to identify tailored strategies to market products) and by researchers (e.g., to further expand the understanding of how consumers perceive and evaluate product design).

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APPENDIX

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Appendix A – Pilot Study Product Details – Chapter 2**Cycling Helmets – Price Statistics per Brand**

Brands	POC	Uvex	Alpina	B'Twin
Max Price	550.00 €	999.95 €	499.00 €	39.99 €
Min Price	80.00 €	44.95 €	39.95 €	4.99 €
Average Price	269.31 €	152.78 €	116.99 €	28.23 €
Median Price	250.00 €	94.95 €	99.95 €	29.99 €
# Products	29	30	24	25

Golf Bags – Price Statistics per Brand

Brands	Titleist	Srixon	Ping	Ogio	Inesis
Max Price	389.00 €	319.99€	275.00 €	239.00 €	119.99 €
Min Price	75.00 €	169.99€	80.00 €	89.00 €	40.99 €
Average Price	223.31 €	205.70€	191.44 €	168.64 €	85.49 €
Median Price	239.00 €	189.99€	190.00 €	169.00 €	90.49 €
# Products	13	7	10	28	4

Appendix B – Pre-tests of Product Stimuli – Chapter 2

Participants from an online panel (N = 256, M_{age} = 35.56, 43% female, MTurk) were randomly assigned to five out of the 25 products used in our studies. They were asked to evaluate the products on the four items of our performance product scale (see Chapter 3). As expected, the products featured in the performance conditions of our studies were rated as significantly more performance-related than the products featured in the non-performance conditions of our studies (Table A1).

Table A1 - Results Pre-tests

Study#	Performance product	Mean	Non-performance product	Mean	t-test
1A	All products 1A	5.15	All products 1A	4.33	t(301) = 4.94 ***
1A	Tennis backpack	4.96	Backpack	4.78	t(100) = .67
1A	Ski gloves	5.58	Gloves	4.49	t(100) = 4.53 ***
1A	Mountain bike t-shirt	4.89	T-shirt	3.73	t(97) = 3.76 ***
1B	All Products 1B	5.46	All Products 1B	4.25	t(401) = 8.63 ***
1B	Toolbox	5.35	Cooler	3.75	t(99) = 5.82 ***
1B	Ski helmet	5.58	Hat	3.72	t(100) = 6.87 ***
1B	Surf rash vest	5.13	T-shirt	4.06	t(99) = 3.64 ***
1B	Mountain bike	5.80	City bike	5.49	t(97) = 1.64
2, 6	Headphones DJ	5.41	Headphones music	4.44	t(98) = 4.09 ***
3A	Ski gloves	5.59	Gloves	4.52	t(99) = 4.12 ***
3B	Bike helmet for race	5.45	Bike helmet for city	4.95	t(98) = 2.20 *
4	Mountaineering t-shirt	5.31	T-shirt	4.23	t(98) = 3.53 **
5	Cooking apron	4.65	-	-	-
Appendix	Regatta sailing shoes	5.18	Leisure sailing shoes	4.55	t(98) = 2.43 *

Notes: *** = $p < .001$; ** = $p < .01$; * = $p < .05$.

Appendix C – Studies' Stimuli – Chapter 2

Study 1A

Product Replicates	Performance	Non-performance
Backback	Imagine you want to buy a new backpack to carry your tennis equipment, like racket, shoes, t-shirt etc.	Imagine you want to buy a new backpack for everyday needs, like going to the university or to the office.
T-shirt	Imagine you want to buy a new t-shirt for mountain biking.	Imagine you want to buy a new t-shirt.
Gloves	Imagine you want to buy new gloves for skiing.	Imagine you want to buy new gloves for daily use during the winter season.

Backback

HEAD **NIKE** **adidas** **PUMA**

Performance	Non-performance
This tennis backpack is very versatile and perfect to carry your tennis equipment to the court. Different compartments allow to orderly organize your tennis gear. The comfortable shape and the resistant material make this backpack perfect for intense tennis trainings.	This backpack is very versatile and perfect to carry what you need wherever the day takes you. Different compartments allow to orderly organize your things. The comfortable shape and the resistant material make this backpack perfect for your daily routine.

T-Shirt

adidas **TREK** **SCOTT** **PUMA**

Performance	Non-performance
This mountain bike t-shirt is ideal for challenging tours and excursions on a mountain bike. The technical material allows transpiration and rapid drying during intense activities and in extreme conditions.	This t-shirt is ideal in any occasion, like at the university or to go out with friends. The technical material allows transpiration and rapid drying during warm summer days.

Gloves

adidas **BURTON** **reusch** **ROSSIGNOL**

Performance	Non-performance
These ski gloves are designed to protect your hands in extreme conditions thanks to their waterproof and breathable membrane. The outer stretch fabric allows great grip and freedom of movement, indispensable for skiing.	These gloves are designed to protect your hands in the winter season thanks to their waterproof and breathable membrane. The outer stretch fabric allows great grip and freedom of movement, indispensable for your daily comfort, like when going to the university or going out with friends.

Instructions held constant across conditions: Now the company asks you to define the optimal design of the [product name] as you would purchase it. Specifically, you have to decide the optimal size and position of the logo. Please draw on the [product name] the logo (brand name that you chose in point 1) as you would like to have it. The logo can be as small or as big as you like and you can decide your logo's position and orientation.

Backpack











T-shirt



Glove



Study 1B – Product Pictures

Performance Mountain Bike	Non-performance City Bike
	
Surf Rush Vest	T-Shirt
	
Ski Helmet	Hat
	
Toolbox	Cooler
	

Note: Product design within each category differed slightly to increase realism. The design was counterbalanced with each logo option (that is, half of the participants chose between a product with a prominent logo in design A vs. a product with no logo in design B, while the other half of the participants chose between a product with a prominent logo in design B vs. a product with no logo in design A). Product design had no significant effects.

Study 2 – Headphones

Performance	Non-performance
Imagine you often perform as a DJ and you would like to buy new headphones for this purpose. You have the possibility to purchase headphones from the brand Tooler, which produces specialized music equipment.	Imagine you often listen to music and you would like to buy new headphones for this purpose. You have the possibility to purchase headphones from the brand Tooler, which produces specialized music equipment.

Study 3A – Private vs. Public Context Manipulation and Product Pictures

Private performance	Public performance	Non-performance
Imagine this winter you want to go to a ski area in the mountains to do ski training. You chose a ski area which you do not expect to be very popular among other people. So you will most likely not meet any other skiers and will ski alone. You would like to buy new gloves to take with you to do ski training alone. You have the opportunity to buy gloves from Tetra, a high-quality brand specialized in ski equipment.	Imagine this winter you want to go to a ski area in the mountains to do ski training. You chose a ski area which you expect to be very popular among other people. So you will most likely meet many other skiers and ski with them. You would like to buy new gloves to take with you to do ski training with many other skiers. You have the opportunity to buy gloves from Tetra, a high-quality brand specialized in ski equipment.	Imagine this winter you want to go to a ski area in the mountains just to relax and enjoy the fresh air. You would like to buy new gloves to take with you to relax and enjoy the fresh air. You have the opportunity to buy gloves from Tetra, a high-quality brand specialized in ski equipment.

Participants were then asked to choose between the two following gloves on a 5-point scale.



Study 3B – Context Manipulation and Product Pictures

Performance	Non-performance
Imagine you want to participate in several bicycle races and you realize that you need a new helmet. So you go online to choose a perfect helmet for this context (e.g. to wear during your bicycle trainings and bicycle races). During your online search, you find two helmets from the brand Scott, which is specialized in bicycle equipment.	Imagine you want to go casually biking around your city and you realize that you need a new helmet. So you go online to choose a perfect helmet for this context (e.g. to wear to go biking to the park, to the university, to the city center). During your online search, you find two helmets from the brand Scott, which is specialized in bicycle equipment.

Participants were then asked to choose between the following two helmets using a dichotomous scale. Helmet design differed slightly in order to ensure realism. The design was counterbalanced and the two settings were randomly assigned to participants. Product design had no significant effects.



Study 4 – Difficult vs. Easy Activity Manipulation and Product Pictures

Difficult performance	Easy performance	Non-performance
Imagine you want to go to the mountains to a renowned place for mountaineering and you want to do some demanding mountaineering. You want to do some difficult routes, which are recommended for experts only. You would like to buy a functional t-shirt to wear in the mountains. You could buy a t-shirt from Tetra, a producer of high-quality mountaineering equipment.	Imagine you want to go to the mountains to a renowned place for mountaineering and you want to do some very basic mountaineering. You want to do some easy routes which are recommended for beginners only. You would like to buy a functional t-shirt to wear in the mountains. You could buy a t-shirt from Tetra, a producer of high-quality mountaineering equipment.	Imagine you want to go to the mountains to a renowned place for mountaineering and you just want to enjoy the view. You would like to buy a functional t-shirt to wear in the mountains. You could buy a t-shirt from Tetra, a producer of high-quality mountaineering equipment.

Participants were then asked to choose between the following two t-shirts on a 5-point scale. Product design slightly differed to ensure realism. The design was counterbalanced and the two settings were randomly assigned to participants. Product design had no significant effects.



Study 5 - Context Manipulation and Product Pictures

<i>High self-improvement motivation performance</i>	<i>Low self-improvement motivation performance</i>	<i>Control performance</i>
Imagine last week you took part in a cooking class. The class was good, and after the experience you became very interested in cooking at a high level: you are extremely motivated to improve your cooking skills and you want to become able to cook sophisticated gourmet dishes. A few days after the class, you notice in a shop an apron from Sigg, a high quality cooking equipment manufacturer, and you are considering buying one.	Imagine last week you took part in a cooking class. The class was good, but after the experience you realized you are not interested in cooking at a high level: you are not motivated to improve your cooking skills, but you just want to be able cook ordinary dishes. A few days after the class, you notice in a shop an apron from Sigg, a high quality cooking equipment manufacturer, and you are considering buying one.	Imagine last week you took part in a cooking class. A few days after the class, you notice in a shop an apron from Sigg, a high quality cooking equipment manufacturer, and you are considering buying one.

Participants were then asked to choose between the following two aprons on a 5-point scale. Product design slightly differed. The design was counterbalanced and the two settings were randomly assigned to participants. Product design had no significant effects.



Study 6 - Context and Brand Specialization Manipulations

	Performance context	Non-performance context
<i>Specialized brand</i>	Imagine you often perform as a DJ in public and you would like to buy new headphones for this purpose. You find headphones from the brand Tooler, which scored 92 out of 100 in Consumer Reports. Tooler is a specialized brand in music gear that produces music equipment exclusively.	Imagine you often listen to music in public and you would like to buy new headphones for this purpose. You find headphones from the brand Tooler, which scored 92 out of 100 in Consumer Reports. Tooler is a specialized brand in music gear that produces music equipment exclusively.
<i>Unspecialized brand</i>	Imagine you often perform as a DJ in public and you would like to buy new headphones for this purpose. You find headphones from the brand Tooler, which scored 92 out of 100 in Consumer Reports. Tooler is a generic electronics brand that produces a variety of equipment for many purposes.	Imagine you often listen to music in public and you would like to buy new headphones for this purpose. You find headphones from the brand Tooler, which scored 92 out of 100 in Consumer Reports. Tooler is a generic electronics brand that produces a variety of equipment for many purposes.

Study 3B Follow-up - Context Manipulation and Product Pictures

Performance	Non-performance
Imagine next month you will go sailing in Spain. You want to rent a sailing boat in a sailing club and to participate in an ambitious sailing regatta with your friends. Now imagine that you need to buy new shoes to wear for the regatta. You have the possibility to choose among two shoe models by a high-quality brand Musto, which is specialized in sailing clothing and accessories.	Imagine next month you will go sailing in Spain. You want to rent a sailing boat in a sailing club and to participate in a leisurely sailing cruise with your friends. Now imagine that you need to buy new shoes to wear for the cruise. You have the possibility to choose among two shoe models by a high-quality brand Musto, which is specialized in sailing clothing and accessories.

Participants were asked to choose between the following two shoe options on a 5-point scale.



Appendix D – Follow-up Study 3B in Role of Consumer Expertise – Chapter 2

In the follow-up study, we explored how consumers' expertise in the performed activity may shape their preference for prominent logos. Existing literature suggests that prominent logos are particularly attractive to consumers with low levels of expertise or status in the domain because they enable consumers to signal higher status and belonging to aspirational groups (Berger and Ward 2010; Han, Nunes, and Drèze 2010; Rucker and Galinski 2009). In contrast, our findings suggest that in performance contexts, prominent logos may serve a different function of signaling competence to self. In such contexts it is not clear how consumers' preference for prominent logos would depend on their baseline level of expertise (i.e. status in the activity). While there may be reasons to expect the desire to feel competent to be stronger among consumers who are inherently less expert in the activity (e.g., due to their need to boost their lowered sense of status and self-esteem; Gao, Wheeler, and Shiv 2009), there may be other reasons to expect that the desire to feel competent may be stronger among individuals who are inherently expert in the activity (e.g., due to their need to assert their expertise and reap pride from it; Kim, Park, and Dubois 2018). Therefore, we expected the desire to feel competent and the resulting preference for prominent logos in performance contexts to emerge among consumers with both high and low levels of inherent expertise. In other words, in a departure from prior work's focus on the role of consumer status in moderating brand prominence preferences, we did not expect a systematic relationship between consumers' inherent expertise and their preference for prominent logos in performance contexts.

Participants and Design

Two hundred participants interested in sailing ($M_{\text{age}} = 38.44$, 26% female) were recruited at a sailing club and on online sailing forums. Both platforms attract individuals with varying levels of sailing expertise (e.g., novices as well as individuals with long-term sailing

experience). We manipulated context (performance vs. non-performance) between participants, as in all other studies. In addition, we measured participants' inherent level of expertise in sailing. Forty-four participants dropped out after the introduction page before getting to the independent and dependent measures, which resulted in 156 observations.

Procedure

First, participants were asked to indicate their inherent level of expertise in sailing on a 3-item scale: "I have a lot of experience in sailing," "I am very skilled in sailing," and "I have a high expertise in sailing" ($M = 4.17$, $SD = 2.16$, $\alpha = .984$, $p < .001$; 1 = "strongly disagree", 7 = "strongly agree"). Participants then read that they were buying shoes to either participate in a sailing regatta (performance) or to participate in a leisurely sailing cruise (non-performance). A pre-test confirmed that the shoes in the regatta context were perceived to be significantly more performance-related than in the leisurely cruise context (same scale: $M_{\text{Perf}} = 5.18$ vs. $M_{\text{NonPerf}} = 4.55$; $t(98) = 2.43$, $p = .017$). Finally, participants were shown the pictures of two pairs of sailing shoes from a sailing brand Musto—one with a prominent logo and one with a subtle logo. Participants indicated their preference between the two logo options on a 5-point scale (1 = subtle logo, 5 = prominent logo).

Results

An ANOVA on logo size preference revealed a higher preference for shoes with a prominent logo in the performance context than in the non-performance context ($M_{\text{Perf}} = 2.79$ vs. $M_{\text{NonPerf}} = 2.19$; $F(1, 154) = 6.72$, $p = .010$, $\eta_p^2 = 0.192$). Moreover, a regression analysis with performance, expertise and their interaction as predictors of logo preference revealed that, while performance had a significant main effect on logo choice ($b = .30$, $SE = .12$, $t(155) = 2.63$, $p = .009$), the effect of the expertise \times performance interaction was not significant ($b = -.06$, $SE = .05$, $t(155) = -1.15$, $p = .251$). The main effect of expertise was marginally

significant ($b = .10$, $SE = .05$, $t(155) = 1.83$, $p = .069$). Furthermore, a moderation analysis (model 1) with expertise as a moderator of the effect of the performance (vs. non-performance) context on logo preference confirmed that the moderation was non-significant ($b = -.062$, $SE = .053$, 95% CI = $[-.167, .044]$).

Discussion

These results confirmed that consumers' inherent level of expertise does not systematically influence brand prominence preferences in performance contexts and categories. This unique finding vis-à-vis the previous literature further underscores that performance products represent an important overlooked context for understanding brand prominence effects, which generates novel theoretical predictions and useful practical implications.

Appendix E – Pilot Study – Chapter 4

In our research, we propose that when an old product performs a function that is dissimilar (vs. similar) from the upcycled product (e.g., using a discarded wine bottle as a lamp shade), it increases product appeal because of perceived creativity. To provide initial support for the proposition that upcycled products can increase appeal through perceptions of creativity, we conducted a pilot study using data from the online shop Etsy.com. We explored some of the characteristics that could distinguish upcycled products from similar control products, including creativity and sustainability. We sampled more than 2,000 reviews of more than 200 upcycled (as defined by the producer) and comparable non-upcycled products and we coded them according to several product characteristics. We found that it is mainly creativity that distinguishes upcycled products from non-upcycled ones and that there is some heterogeneity within the upcycled products as well.

Methods

With the aim to analyze 1,000 reviews of upcycled products and 1,000 reviews of comparable non-upcycled products, we first randomly selected 118 upcycled products by searching for the keyword “upcycled” from Etsy.com, an online shop that sells upcycled as well as conventional products. As the number of reviews for each product differed, we obtained uneven product sample sizes.

Secondly, we selected 118 comparable non-upcycled products. For every upcycled product in the sample we searched for a non-upcycled product with similar characteristics. To search for similar items, we used keywords from the product description of the upcycled product (e.g., for the upcycled product “Drinking glasses from recycled blue moon beer bottles, 8oz”, we used the keywords “drinking glasses 8oz” to search for the comparable non-upcycled product). The comparable non-upcycled products also had a price similar to the corresponding upcycled product (a deviation of +/- \$2 for low-price products \leq \$20, a

deviation of +/- \$5 for the middle category $\$20 < x \leq \100 , a deviation of +/- \$25 for the high-price items $> 100\$$; price averages: $M_{\text{up}} = \$44$, $M_{\text{non-up}} = \$38$). All the selected products had a customer rating between 4.5 and 5 points out of 5, in order to keep the perceived product value constant. The selected products belong to the top-three product categories of the online shop: “home and living” ($N = 116$), “accessories” ($N = 70$) and “clothing” ($N = 50$). We obtained a total sample of 236 products.

Thirdly, we sampled the ten oldest available reviews for each product in the sample (number of available reviews per product for upcycled products: min = 3, max = 5,058, $M = 309.5$; number of available reviews per product for non-upcycled products: min = 10, max = 4,932, $M = 470.67$). We sampled the oldest reviews because they are supposed to be more authentic, since they are less likely to be influenced by pre-existing reviews. We obtained a sample size of 2,008 consumer reviews.

Finally, two coders coded all the reviews using on a codebook (see Table A2) based on the previous literature (Keith and Silies 2015; O’Rourke & O’Sullivan 2015; Sung et al. 2014) and on a pre-analysis of twenty products’ reviews. The coding categories were: “creativity”, “design”, “sustainability”, “uniqueness”, “craftsmanship”, “functionality”, “showing-off”, “symbolic meaning for the self” and “special occasion.” We also created a control coding category named “external elements” in order to check if external circumstances, not directly related to the product but related to the buying process (e.g., shipping, customer service, price), may have affected the reviews. Each coding category contained a pre-determined set of keywords to help the coders in the analysis, however, coders could add additional keywords or phrases consistent with the coding category during the coding process.

Table A2 - Pilot Study: Codebook

Coding Category	Definition	Keywords	Examples
CREATIVITY A priori code (Sung et al., 2014)	<p>New product creativity can be defined as the degree to which a new product is perceived to be uniquely different from competitors' products in a manner that it is meaningful to target consumers.</p> <p>One of the most important aspects of creativity is novelty, meaning the extent to which an object differs from conventional practice. Product novelty is likely to elicit a positive affective response.</p>	Original Novel Unexpected Cool Witty/Fun Unusual Unique Innovative Surprising Creative	"Great idea" / "Clever use of recycled beer bottles" / "different from anything I have" / "extremely original"
DESIGN A priori code (Keith and Silies, 2015)	<p>The design of a product and its visual appearance. It can also be described as the beauty or refinement in an outcome or product.</p>	Design Look Appearance Style Beautiful Well designed Attractive Artistic/Artful	"Attractive Design"/ "simply beautiful"/ "great design concept" / "while the recycled material is a cool feature, it was really the look of the piece that drew me to it" / "beautiful color"
SUSTAINABILITY A priori code (Sung et al., 2014)	<p>Sustainable products are products that, due to their composition, contribute to dealing with socio-ecological problems on a global level and provide measurable improvements in socio-ecological product performance. People who follow environmental conscious consumption patterns buy these kind of products because of these positive effects and/or this fits their lifestyle (e.g., LOHAS –lifestyle of health and sustainability).</p>	Environmental value Conscientious consumerism Waste avoidance	"Great, no east Asia import" / "Love the idea of repurposing products in a far too disposable world." / "this is a Christmas gift for my son-in-law who genuinely lives the environmental friendly life."
UNIQUENESS A priori code (O'Rourke & O'Sullivan, 2015)	<p>Uniqueness refers to a higher value of a product for the consumer on the basis of its scarcity and rareness. Moreover, the concept of uniqueness can be related to an individual's pursuit of differentness relative to others achieved through the acquisition, utilization and disposition of consumer goods.</p>	Customization/ Personalization Scarcity Rareness Individual Limited edition Customized	"I liked being able to personalize these picks by state and year" / "I wanted something unique" / "custom made to order option was available" / "it's one of a kind"
CRAFTSMANSHIP A priori code (Keith and Silies, 2015)	<p>The quality work shown in something made by hand. Referring to the appreciation of the nature and quality of the product and in particular the way it is actually produced/ manufactured.</p>	No mass production Hand-made Quality Professional Workmanship Care Construction	"Excellent craftsmanship"/ "perfect size and artist work is top quality!" / "made with love" / "Fantastic quality-made bowl!"
FUNCTIONALITY From data set	<p>The code functionality refers to the performance aspect of the product. This includes the utilitarian value of the product for the consumer and any kind of related consumer benefit.</p>	Suitable Consumer benefit Utilitarian value Durable Useful	"Great for camping" / "The bowl is beautiful and makes a great piece to hold keys and other random items" / "... for parties, especially those with a musical theme, it's fabulous!"
SHOWING-OFF From data set	<p>Here, the major motive for product choice is to satisfy the need for self-affirmation, facilitated by positive response from others regarding product choice. (Self-) affirmation can be achieved through compliments of others or one's own affirmation (in terms of products or consumer goods one possesses).</p>	Attention-getting value Compliments Conspicuous consumption Prestige	"Everyone thought it was such a cool ornament" / "He tweeted a picture of the bag to his bike friends, and they all loved it." / "Great conversation starter at a party"

SYMBOLIC MEANING FOR THE SELF From data set	Product attachment represents an emotion-charged bond that develops if the product has a special meaning to the owner. A product's symbolic meaning is related to attachment, but is not directly related to its performance.	Personality fit Compatible to a person's hobbies/interests Personal style Expression of (self-) image Identification with product Nostalgia	"Sounds silly because it's just a doormat but it reflects my quirky/positive personality right when people walk up to my door. Love it!" / "My husband is a DJ using records, he loves this bowl"
SPECIAL OCCASION From data set	Any specific event/occasion/person the product was purchased for.	Gift Events	"This was a gift for my boyfriend"/ "I got it for Christmas"/ "Got this as a house warming gift for a befriended couple."
EXTERNAL ELEMENTS From data set	Any expressions, valuations and statements that can be classified as potential influences on the product rating but which are not directly related to the product itself.	Shipping / delivery Contact Customer service Shop experience Price	"Wonderful Seller!!" / "I will definitely shop from here again." "Shipped extremely fast" / "speedy delivery considering it was from overseas." "Beautifully presented in a very attractive box."

Results and Discussion

Two independent coders ($\kappa = 0.84$) coded all the reviews proceeding on a product basis. For each review and coding category, a 1 was assigned if a keyword from the coding category was mentioned in the review, or a 0 if it was not mentioned. We obtained a total 3,113 keywords ($N = 1,594$ for upcycled products, $N = 1,519$ for non-upcycled products).

A Chi-Square test of independence reveals that, although upcycled products are significantly less likely to be described by reviewers as functional ($X^2(1, N = 2,008) = 10.80, p = .001$) and as having a good design ($X^2(1, N = 2,008) = 17.08, p = .000$) than non-upcycled products, reviews of upcycled products are more likely to mention keywords related to *creativity* ($X^2(1, N = 2,008) = 78.67, p = .000$), *sustainability* ($X^2(1, N = 2,008) = 5.61, p = .030$) and *symbolic meaning for the self* ($X^2(1, N = 2,008) = 6.46, p = .015$) than reviews of non-upcycled products.

However, it appears that *creativity* is the feature that characterizes upcycled products to a greater extent than *symbolic meaning for the self* and *sustainability*. Specifically, *symbolic meaning for the self* was mentioned in 27% of the reviews of the upcycled products,

and the keyword *sustainability* in the reviews of only 10% of the upcycled products; whereas 74% of the upcycled products had at least one keyword related to *creativity* (see Table A3). Thus, we can conclude that creativity may be a relevant feature that distinguishes upcycled products from non-upcycled ones in the eyes of consumers, and that there is some heterogeneity within upcycled products in terms of creativity.

Table A3 - Pilot Study: Percentage of Products With at Least One Keyword for Coding Category

	Upcycled	Non-Upcycled
Creativity	73.73%	33.90%
Sustainability	11.02%	2.54%
Symbolic Meaning for the Self	27.12%	18.64%
Design	84.75%	88.98%
Functionality	35.59%	50.85%
Uniqueness	33.90%	22.03%
Craftsmanship	76.27%	79.66%
Showing-off	24.58%	17.80%
Special Occasion	59.32%	55.93%
External Elements	98.31%	97.46%




Appendix F – Studies' Stimuli – Chapter 4

Study 1 – List of Upcycled Products From Etsy.Com



Nr.	Old Product	New Product	Nr.	Old Product	New Product
1	Motor	Table	101	Men's Shirt	Apron
2	Beer Bottles	Drinking Glasses	102	Sweaters	Diapers
3	Vinyl Record	Clock	103	Football	Lamp
4	Whiskey Bottle	Candle	104	Football	Bowl
5	Wine Bottles	Lights	105	Coffee Bag	Cushion
6	Linens	Tea Cozy	106	Bicycle Hose	Key Board
7	Tin Can	Candle	107	Steampunk Gear	Bookend
8	Wine Bottles	Wind Chime	108	Gin Bottle	Soap Dispenser
9	Jars	Chandelier	109	Towel	Napkins
10	Plastic Tray	Birdbath	110	Bottle	Vase
11	Potato Chip Label	Notepad	111	Copper Tubes	Candle Holder
12	Vinyl Record	Bowl	112	Wine Bottle	Candle
13	Cake Pan	Cookie Server	113	GDR heating lamp	Lamp
14	Beer Bottles	Shot Glasses	114	Ladder	Coffee Table
15	Mason Jar	Chandelier	115	Drawers	Shelf
16	T-shirt	Pillow	116	Cement Sack	Flower Case
17	Vinyl Record	Clock	117	Map	Document Case
18	Teatowel	Pillow	118	Men's shirts	Lavender's bag
19	Jelly Jar	Candle	119	Beer Bottle	Glasses
20	Enamel Container	Lamp	120	T-shirt	Pillow Cover
21	Sheet	Rug	121	Fork	Coat Hook
22	Map	Switch Plate	122	Floor Laminate	Lamp
23	Metal Pipes	Pencil Holder	123	Table Hairdryer	Lamp
24	Necktie	Dog Collar	124	Newspapers	Trash Can
25	Wine Bottle	Suncatcher	125	Light Bulbs	Hanging Lamp
26	Gin Bottle	Lamp	126	Light Bulbs	Hanging Lamp
27	Dictionary Pages	Coasters	127	Beer Bottles	Shot Glasses
28	Dresser Scarf	Apron	128	Jeans Denim	Earrings
29	Linens	Tea Towel	129	Nespresso Capsules	Earrings
30	Buttons	Necklace	130	Fishing net line	Bracelet
31	Kitchenware	Chimes	131	Climbing Rope	Key Fob
32	Lincoln Hubcap	Clock	132	Bicycle Tire	Key Ring
33	Wine Bottle	Light	133	House coat	Coat
34	Cabinet Door	Coat Hanger	134	Curtains	Top
35	Book	Clock	135	Ties	Skirt
36	Beer Bottle	Wall Sconce	136	Cementsack	Fanny Pack
37	Window Frame	Jewelry Organizer	137	Bicycle brake disc	Clock
38	Wine Bottle	Candle Holder	138	Billboards	Backpack
39	Boat Cleats	Coat Hooks	139	Pants	Scruchie
40	Tea Cup	Bird Feeder	140	Sail	Toiletry Bag
41	Scrabble Pieces	Magnets	141	Coffee Bag	Bag
42	T Shirts	Chair Cushion	142	Atlats	Notebook
43	Jars	Chandelier	143	Silver Fork	Necklace
44	Hubcap	Clock	144	Atlas Map	Gift Bag
45	LP Record	Bowl	145	Kite Sail	Toiletry Bag
46	Silverware	Wind Chimes	146	Nespresso Capsules	Lightchain
47	Coffee Beans Bag	Clutch Bag	147	Bicycle Tire	Belt
48	Whiskey Bottle	Lamp	148	Gin Bottle	Vase

49	Suit Coats	Messenger Bag	149	CD	Clock
50	Bike Chain	Cufflinks	150	Towel	Bib
51	Skateboard	Rings	151	Makeup Can	Jewelry Box
52	T Shirts	Scarf	152	Tin	Tin Planters
53	Bottle Cap	Pendant	153	Old Rudder	Coat Hook
54	Seatbelt	Camera Strap	154	Towel	Bib
55	Bullets	Cuff Links	155	Christmas Tree Stand	Candle Holder
56	Skittles Bag	Coin Purse	156	Nespresso Capsule	Jewelry
57	Airmail Bag	Neckwarmer	157	Towel	Washcloths
58	Bike Inner Tube	Pencil Case	158	Door Handles	Wardrobe
59	Comic	Cuff Links	159	Vinyl Record	Clock
60	Tea Spoon	Keychain	160	Spotlight	Table Lamp
61	Wool Scarf	Neckwarmer	161	Blazer	Hipbag
62	T-Shirt	Necklace	162	Book Cover	Tablet Cover
63	Fire Hose	Shaving Kit	163	Pallet	Shelf
64	Cashmere Sweater	Handwarmers	164	T-shirts	Dress
65	Tweed Jacket	Cap	165	Men's shirt	Baby Pants
66	Buttons	Barrette	166	Jeans	Bag
67	Designer Bag	Key Chain	167	Measuring Tape	Key Chain
68	Necktie	Necklace	168	Jeans	Handbag Shopper
69	Beer Can	Belt Buckle	169	Denim Shirt	Baby Pants
70	Bicycle Tire	Belt	170	Blouses	Cosmetic Bag
71	T-Shirt	Scarf	171	Air Chamber	Handbag
72	Champagne Bottle	Bangles	172	Bottles	Glasses
73	Soda Can	Necklace	173	T-shirts	Bags
74	Envelope Paper	Necklace	174	Seed Sack	Shoulder Bag
75	Puzzle Piece	Brooch	175	Pallet	Coffee Table
76	Military postbag	Messenger Bag	176	Shower Curtain	Crossbody Purse
77	Coffee Bag	Purse	177	Seatbelt	Guitar Strap
78	Colored Pencils	Bracelet	178	Vodka Bottle	Vase
79	Vodka Bottle	Earrings	179	Plate	Cake Stand
80	Necktie	Necklace	180	Bottle	Bowl
81	Wallpaper	Earrings	181	Leather Jacket	Messenger Bag
82	Soda Pull Tabs	Bracelet	182	Watch Mechanism	Cufflinks
83	Tablecloth	Dress	183	Leather Bag	Travel Wallet
84	T-Shirt	Baby Romper	184	Lamp	Bird Feeder
85	Flag	Hoodie Vest	185	Market Stall Covers	Laptop Sleeve
86	T-Shirts	Skirts	186	Sweater	Hat
87	Blue Jeans	Skirt	187	Silk Sari	Silk Scarf
88	T-Shirts	Lingerie	188	Old ties	Tie
89	Polo Shirt	Tunic Top	189	Neck Tie	Dog Collar
90	Man's Shirt	Tunic	190	Book	Clutch Bag
91	Cotton Sheet	Toddler Romper	191	Sweater	Scarf
92	Dress Shirts	Skirt	192	Pallet	Candle Holder
93	T-Shirt	Skirt	193	Antique Journal	Journal
94	Men's Shirt	Blouse	194	Videotapes	Zip Pouch
95	Pillowcase	Baby Girls Dress	195	Seatbelts	Bag
96	Sweaters	Sweater Coat	196	Telephone	Lamp
97	Linens	Dress	197	Sweater	Neckwarmer
98	Dress	Babydoll Dress	198	Sugar Sack	Bag
99	Scarf	Kaftan Tunic	199	Liquor Bottle	Soap Dispenser
100	Doilies	Skirt	200	Light Bulb	Vase

Study 2A – Stimuli

Product	High Dissimilarity	Low Dissimilarity	Control
<p>SIDE TABLE</p> 	<p>Brand: Madena tables Diameter: 12" Height: 25" Characteristics: made with pieces of wood taken from an old whiskey barrel</p>	<p>Brand: Madena tables Diameter: 12" Height: 25" Characteristics: made with pieces of wood taken from an old side table</p>	<p>Brand: Madena tables Diameter: 12" Height: 25" Characteristics: made with pieces of wood</p>
<p>KEY RING</p> 	<p>Brand: Keypel Pendant size: 1.6" x 1.1" Characteristics: the pendant is an old refurbished metal fork</p>	<p>Brand: Keypel Pendant size: 1.6" x 1.1" Characteristics: the pendant is an old refurbished metal key ring</p>	<p>Brand: Keypel Pendant size: 1.6" x 1.1" Characteristics: the pendant is refurbished metal</p>
<p>PENDANT LAMP</p> 	<p>Brand: Lightist Height: 11" Diameter: 9" Characteristics: the shade holder is glass and is a wine bottle</p>	<p>Brand: Lightist Height: 11" Diameter: 9" Characteristics: the shade holder is glass and is a holder from another lamp</p>	<p>Brand: Lightist Height: 11" Diameter: 9" Characteristics: the shade holder is glass</p>

Study 2B – Stimuli

High dissimilarity	Low dissimilarity
	
<p>This table is made reusing pieces of a whiskey barrel</p>	<p>This table is made reusing pieces of another side table</p>

Study 3 – Stimuli

Keychains



Stickers







Packages and flyer



Stand



Study 4A – Stimuli

Product	High Dissimilarity	Low Dissimilarity	Control
	<p>Model: Rustic Dimensions: L 14 .2x H 11.5 x W 5.7" Description: Unisex messenger bag. It is water resistant and has a laptop compartment Material: This bag is made from reclaimed truck canvas and seatbelts</p>	<p>Model: Rustic Dimensions: L 14 .2x H 11.5 x W 5.7" Description: Unisex messenger bag. It is water resistant and has a laptop compartment Material: This bag is made from reclaimed canvas bags</p>	<p>Model: Rustic Dimensions: L 14 .2x H 11.5 x W 5.7" Description: Unisex messenger bag. It is water resistant and has a laptop compartment</p>
	<p>Model: Kuka Dimensions: Ø 47.2", H 29.2" Description: The material is water-resistant and suitable for the outdoors Material: This table is made from refurbished copper pipes & wine crates</p>	<p>Model: Kuka Dimensions: Ø 47.2", H 29.2" Description: The material is water-resistant and suitable for the outdoors Material: This table is made from wood from refurbished furniture</p>	<p>Model: Kuka Dimensions: Ø 47.2", H 29.2" Description: The material is water-resistant and suitable for the outdoors</p>
	<p>Model: Lumi Dimensions: ø 5.9 x H 10.6" Description: Made of clear glass and paired with a warm light bulb Material: This lampshade is made from reclaimed glass whiskey bottles</p>	<p>Model: Lumi Dimensions: ø 5.9 x H 10.6" Description: Made of clear glass and paired with a warm light bulb Material: This lampshade is made from reclaimed glass lampshades</p>	<p>Model: Lumi Dimensions: ø 5.9 x H 10.6" Description: Made of clear glass and paired with a warm light bulb</p>
	<p>Model: Amity Dimensions: L 28" x H 20" x W 7" Description: It has a water-resistant coating Material: This shelf is made from refurbished wooden pallets used in transport</p>	<p>Model: Amity Dimensions: L 28" x H 20" x W 7" Description: It has a water-resistant coating Material: This shelf is made from refurbished wooden shelves</p>	<p>Model: Amity Dimensions: L 28" x H 20" x W 7" Description: It has a water-resistant coating</p>

Study 4A – Openness to Experience Scale (John And Srviastava 1999)

Participants had to report their openness to experience on a 5-point scale (1 = “strongly disagree”, 5 = “strongly agree”).

“I see myself as someone who...”

...is original, comes up with new ideas
 ...is curious about many different things
 ...is ingenious, a deep thinker
 ...has an active imagination
 ...is inventive

...values artistic, aesthetic experiences
 ...prefers work that is routine (*reverse*)
 ...likes to reflect, play with ideas
 ...has few artistic interests (*reverse*)
 ...is sophisticated in art, music, or literature

Study 4B – Stimuli

Imagine you are invited to a birthday party of your friend Alex and you would like to bring a gift.

High Openness to Experience	Low Openness to Experience
Your friend Alex is a very friendly person who likes to spend time with people. Alex is also a person very open to new experiences. Your friend likes to have variety in the day-to-day life and craves novelty: Alex is often willing to try out new activities that has not experienced previously, and values novel and innovative ideas and situations. Moreover, Alex tends to be intellectually curious and imaginative in the outlook and behavior. Finally, Alex is a very loyal person, always available to help friends.	Your friend Alex is a very friendly person who likes to spend time with people. Alex is also a person very reluctant to new experiences. Your friend seeks refuge in familiar surroundings and in the ‘tried-and-tested’ predictability of traditions: Alex prefers habitual situations and routines over new experiences, and gains comfort from the familiarity of the own usual environment. Moreover, Alex tends to be conventional and traditional in the outlook and behavior. Finally, Alex is a very loyal person, always available to help friends.





Now imagine that you go to a shop to buy Alex a gift. The shop offers you a choice between a pair of products, and you need to pick something that your friend Alex would enjoy.

High Dissimilarity		Low Dissimilarity	
			
Brand: Madena tables Diameter: 12" Height: 25" Characteristics: made with pieces of wood taken from a whiskey barrel	Brand: Lasi tables Diameter: 20" Height: 26" Characteristics: made with pieces of wood	Brand: Madena tables Diameter: 12" Height: 25" Characteristics: made with pieces of wood taken from another side table	Brand: Lasi tables Diameter: 20" Height: 26" Characteristics: made with pieces of wood

Study 5 – Stimuli

Hedonic Value	Utilitarian Value
Imagine you are looking for a lamp to give as a present to a friend. You know that your friend would like a functional lamp to lighten his living room. Thus, he would like a lamp that can give him a great performance.	Imagine you are looking for a lamp to give as a present to a friend. You know that your friend would like an enjoyable lamp to decorate his living room. Thus, he would like a lamp that can give him a great experience.

In a furniture shop you see these lamps:

High Dissimilarity		Low Dissimilarity	
Brand: Lumix Features: these hanging lamps are made reusing the horns of old gramophones.	Brand: Solis Features: these hanging lamps are made of aluminum.	Brand: Lumix Features: these hanging lamps are made reusing the shades of other old hanging lamps.	Brand: Solis Features: these hanging lamps are made of aluminum.
			

Appendix G – Pre-tests Results – Chapter 4

Five hundred and eight participants ($M_{\text{age}} = 36.85$; 45.6% female) participated in one of five pre-tests to evaluate the stimuli of studies 2A, 2B and 4B (which had the same stimuli), 3, 4A and 5. In each pre-test, first, participants rated the attractiveness of the old products. Specifically, they rated their attitude, the perceived appeal and the coolness of the old products both from the high and low dissimilarity condition in a random order (i.e., “How do you evaluate [old product]?”; attitude: 1 = “negatively”, 5 = “positively”; appeal: 1 = “not appealing”, 5 = “appealing”; coolness: 1 = “not cool”, 5 = “cool”). These three items were then averaged to create an index of attractiveness because of the high correlation between the items. Then, they were asked to evaluate the dissimilarity between the old product and the new product for both the high and low dissimilarity conditions in a random order (i.e., as in study 1, “To what extent is a [old product] similar to a [new product]?”; “To what extent is the function of a [old product] similar to the function of a [new product]?”; 1 = “not similar at all”, 5 = “very similar”, reverse-coded).

Results show that across all studies there is either no difference in terms of attractiveness (i.e., consumer attitude, appeal and coolness) towards the old product between the high and low dissimilarity conditions, or the old product in the high dissimilarity condition is even rated more negatively, less appealing and less cool compared to the old product in the low dissimilarity condition (bag, lamp and shelves of study 4A) (see Table A4). Hence, any differences observed in the main study cannot be attributed to differences in the attractiveness of the old products used.

Table A4 - Pre-Test on Attractiveness of the Old Products

Study	N	High Dissimilarity				Low Dissimilarity				p-value
		α_{items}	Product	Mean	SD	α_{items}	Product	Mean	SD	
2A	102	.902	Whiskey barrel	3.79	1.00	.783	Side table	3.81	.76	.809
		.795	Fork	3.62	.85	.847	Keyring	3.61	.89	.971
		.908	Wine bottle	3.84	1.02	.881	Pendant lamp	3.90	.83	.570
2B & 4B	103	.906	Whiskey barrel	3.93	.93	.813	Side table	3.94	.74	.891
3	101	.887	Parachute	3.77	1.05	.750	Keyring	3.75	.81	.864
4A	102	.892	Truck canvas	3.11	.98	.817	Canvas bag	3.78	.76	.000
		.805	Wine crate & Pipes	3.50	.90	.907	Furniture	3.60	.98	.334
		.924	Whiskey bottle	3.61	1.13	.716	Lamp	3.99	.69	.002
		.816	Pallets	3.16	1.11	.906	Shelf	3.96	.77	.000
5	100	.918	Gramophone	3.66	1.07	.869	Lamp	3.76	.92	.406

Moreover, results show that across all studies, the old product is significantly more dissimilar from the new product in the high dissimilarity conditions than in the low dissimilarity conditions, which validates our manipulations (see Table A5).

Table A5 - Pre-Test on Dissimilarity Between New and Old Product

Study	N	High Dissimilarity			Low Dissimilarity			p-value
		New – Old Product	Mean	SD	New – Old Product	Mean	SD	
2A	102	Whiskey barrel - Side table	3.37	1.20	Side table - Side table	1.51	.67	.000
		Fork – Keyring	4.04	1.26	Keyring – Keyring	1.51	.66	.000
		Wine bottle – Pendant lamp	4.03	1.25	Pendant lamp – Pendant lamp	1.59	.74	.000
2B & 4B	103	Whiskey barrel – Side table	2.86	1.16	Side table – Side table	1.58	.58	.000
3	101	Parachute – Keyring	3.89	1.46	Keyring – Keyring	1.68	.71	.000
4A	102	Truck canvas – Messenger bag	3.37	1.27	Canvas bag – Messenger bag	1.84	.82	.000
		Wine crate & Pipes – Table	3.53	1.18	Furniture – Table	2.30	1.06	.000
		Whiskey bottle – Lamp	3.90	1.36	Lamp – Lamp	1.46	.65	.000
		Pallets – Shelf	2.84	1.02	Shelf – Shelf	1.42	.61	.000
5	100	Gramophone – Lamp	3.99	1.32	Lamp – Lamp	1.73	.82	.000

Appendix H – Additional Studies' Results – Chapter 4

Study 2A – Mediation Analysis – Output Model 4 Process

	coeff.	se	t	p	LLCI	ULCI
<i>a-path</i>	.2653	.0629	4.2193	.0000	.1416	.3889
<i>b-path</i>	.6255	.0249	25.1212	.0000	.5765	.6745
<i>c'-path</i>	-.0116	.0305	-.3804	.7039	-.0715	.0483
<i>indirect effect</i>	.1659	.0390			.0897	.2426

Study 2B – Mediation Analysis – Output Model 6 Process

	coeff.	se	t	p	LLCI	ULCI
<i>a₁-path</i>	.1660	.0692	2.3979	.0173	.0296	.3024
<i>a₂-path</i>	.1830	.0513	3.5638	.0004	.0818	.2841
<i>b₁-path</i>	.1513	.0570	2.6537	.0085	.0390	.2636
<i>b₂-path</i>	.5427	.0651	8.3396	.0000	.4145	.6708
<i>c'-path</i>	-.0229	.0530	-.4318	.6663	-.1273	.0815
<i>d₂₁-path</i>	.4827	.0473	10.2067	.0000	.3896	.5759
<i>indirect effect</i>	.1679	.0424			.0909	.2586
<i>ind1*</i>	.0251	.0164			.0034	.0721
<i>ind2*</i>	.0435	.0209			.0078	.0925
<i>ind3*</i>	.0993	.0319			.0434	.1714

*ind1: dissimilarity → aha! effect → appeal; ind2: dissimilarity → creativity → aha! experience → appeal; ind3: dissimilarity → creativity → appeal

Study 4A – Moderation Analysis – Output Model 1 Process

	coeff.	se	t	p	LLCI	ULCI
<i>b₁ (dissimilarity)</i>	-1.0069	.3846	-2.6179	.0095	-1.7649	-.2489
<i>b₂ (OtE)</i>	.1264	.0658	1.9209	.0560	-.0033	.2560
<i>b₃ (interaction)</i>	.2349	.0759	3.0946	.0000	.0853	.3845