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The Secret of Self-Made: The Potential of Different Types of Consumer Participation for Product Attachment and Commercial Value

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Abstract: Consumer participation in the product production process offers chances for consumers and marketers alike, promising a better fit to consumer needs, a more fulfilling product relationship, and a higher willingness to pay (WTP). To exploit this potential, a key question is as to what type of participation evokes the most positive effects with respect to product attachment and commercial value. Two experimental studies in different product domains (cloth bag design and smartphone customization) explore the specific effects of self-creation versus self-design (study 1, $N = 106$) and functional versus cosmetic customization (study 2, $N = 272$). Study 1 highlighted the role of product attachment as a mediator of WTP and the role of experienced effort related to consumer participation as one chance to create such attachment. The specific type of consumer participation appeared to be less decisive, i.e., self-design and self-creation appeared to be equally successful for creating product attachment. Study 2 revealed cosmetic customization to be more related to product attachment, functional customization to be more related to WTP, and both in combination as most effective. In addition to a number of theoretical and practical contributions to the psychological understanding and successful design of consumer participation, the present study highlights several aspects for future exploration such as potential backfire effects of customization.

Keywords: consumer participation; self-design versus self-creation; cosmetic versus functional customization; product attachment; willingness to pay (WTP)

1. Introduction

In the 1990s, [Pine and Gilmore \(1998\)](#) emphasized product customization as a central factor for business success within the age of the “experience economy”, which has not yet come to an end ([Pine and Gilmore 2013](#)). In their view, the progression of economic value over the last centuries, from commodities in the agrarian economy, to mass products and services, and finally memorable experiences, can be best characterized by an increasing customization of products to customer needs. “Companies create offerings more relevant to the wants and needs of individual buyers, differentiate their goods and services from the sea of lookalike competitors and thereby increase the value provided, and thus the price charged, to users and clients.” ([Pine and Gilmore 2013](#), p. 27). Customization also offers more active roles to consumers, where the consumer not only chooses between single predefined options, but actively takes part in the design or even production process. This, for example, includes the customization of smartphones ([motorola.com/us/moto-maker](#)), sport shoes ([miadidas.com](#)), furniture ([woodenstreet.com/custom-furniture](#)), coffee mugs ([custommugcup.com/](#)) or food ([mymuesli.com](#)). With the advanced possibilities for mass customization on the one side and consumer engagement

through the internet to everyone's personal needs on the other side, this trend is still growing across all product domains. At a larger level, the rising popularity of consumer participation in the product production process may also express companies' increasing attempts to benefit from customer knowledge beyond traditional approaches, including approaches of product co-development (Grabher et al. 2008).

However, both from a consumer value and marketing perspective, a more comprehensive understanding of particular consequences of different types of consumer participation and relevant psychological mechanisms is required. For example, an important discussion within co-development research refers to the varying degree of consumer involvement and the (implicitly assigned) consumer role (Grabher et al. 2008): In fact, the consumer's role may vary from that of a layperson collaborating with the producer in product design, to that of a "professional user" with expert knowledge accumulated by using and modifying the product, as seen for example in open source projects. Initially rooted in the area of software development, the exploitation of open source principles meanwhile has also reached other domains such as, for example, drug development (Tapscott and Williams 2008). However, even when focusing on a rather simple form of consumer involvement, i.e., the opportunity for customizing product attributes in line with one's preferences, different subtypes of participation can be differentiated and different factors need to be considered to assess their specific potential. As Miceli et al. (2007) point out, despite the early excitement about customization opportunities, there are a number of critical issues requiring further exploration and analysis. If not thoroughly planned, companies' desire to profit from consumer participation can even have opposite effects and result in consumer confusion and wasteful investments. For example, consumers can have difficulty defining their preferences correctly, they can be confused by increasing variety, they can lack the capabilities to create a fully satisfying product out of the many opportunities, and not all types of product attributes might be equally suitable for customization.

From a consumer and a marketing perspective, the interplay of design factors of consumer participation is of high interest. More specifically, for an effective implementation of consumer participation, it is important to know which specification of consumer participation "pays off" to what degree. For example, a central question is what degree of consumer involvement is required to achieve most positive effects. A basic rationale behind customization is that adjusting products to personal preferences will increase consumers' need fulfillment, assigned product value, and finally willingness to pay (WTP). However, in addition to an enhanced fit between consumer needs and product attributes, it has been argued that the involvement of consumers in the production process is of value itself. The so-called "I designed it myself effect" describes that, regardless of the actual preference fit, the feelings of having designed a product themselves creates economic value for consumers (Franke et al. 2010). Interestingly, such overvaluation emerges even when false beliefs of self-creation are elicited, i.e., when participants believe they have created an item, regardless of whether this belief is true or false (Koster et al. 2015). However, Schreier (2006) argues, that independent from the pride of having created something on their own and the positive "pride of authorship effect" on product value, consumers may take experiential benefits from the actual process of self-design (so-called "process benefits"). This would speak for a differential effect of self-design (e.g., picking colors for a sport shoe then applied by the manufacturer) and self-creation (actually coloring the sport shoe oneself), since different kinds of process benefits can be assumed. In the end, the final question is what type of consumer participation is required to provide which kinds of benefits, to strategically align those factors to the envisioned outcomes. To date, however, research in the field does not provide a sufficient basis to fully answer these questions, indicating a lack in research regarding theoretical considerations (e.g., the assumed psychological processes underlying empirical differential effects of consumer participation on variables such as product attachment, product use, and attributed commercial value, and the interrelations between these variables) as well as practical implications (e.g., the strategic design of consumer participation with regards to marketing or societal interests such as sustainability).

In the present study, we aim to address this gap and advance insights on consumer participation in two main respects: first, a more comprehensive understanding of the specific effects of different types of consumer participation, and second, a more holistic perspective on its effects, including the consumer and marketing perspectives in the long and short term. While existing research in the field already covers a variety of different types of consumer participation, only a few studies so far have compared different types and their specific effects systematically. For example, [Atakan et al. 2014a](#) provided studies on the single effects of self-design, self-creation, and the combined effects of both, but no study which directly contrasted both types of self-creation in one study setting. Also, while previous research did primarily consider consequences of consumer participation for the consumer itself such as valuation, identification with/affective commitment to the product ([Atakan et al. 2014a](#)), a product's perceived aesthetic and functional fit, perceived uniqueness, or the perceived utility of self-designed products ([Franke and Schreier 2008](#)), the present research expands its focus to the relationship between consequences for the consumer itself and communication about the product to others, potentially influencing their future decisions in terms of product choice. In addition, our study also focuses on potential relationships between product attachment and prolonged usage of the product. Altogether, this lays a basis for a future investigation of the topic for a larger and long-term perspective, beyond the single individual and the single act of choice.

More specifically, the present investigation considers two basic dimensions and their design factors within the implementation of consumer participation in the product production process:

- the consumer dimension, e.g., the specific type of participation and influence the consumer has in the production process, and the resulting effort required. For example, the specific type of consumer participation and effort required can range from picking ingredients for the preferred muesli to actually designing the product with one's own hands, e.g., coloring one's personal coffee mug using a do-it-yourself (DIY) kit.
- the product dimension, e.g., the specific product attributes being customized. For example, this could be related to pragmatic attributes like a smartphone's memory capacity, or hedonic attributes like a sport shoe's color combination.

Likewise, we shed light on the consequences of consumer participation from two different perspectives, namely, the consumer experience, including measures such as product attachment, subjective product value, and product usage, as well as the marketing perspective, with an interest in consumers' willingness to pay (WTP) or recommendations to others (i.e., word-of-mouth, WOM).

In the remainder of this paper, we first provide a short overview of related research and theory underlying our assumptions on the effects of different types of consumer participation. We then present two empirical studies, each focusing on one specific design factor within the implementation of consumer participation: Study 1 contrasts self-design versus self-creation, corresponding to mass customization versus DIY products, and explores product attachment as a possible mediator for product value and sustained use. This was operationalized through a longitudinal combined laboratory and field study, where participants first received a product and then used this product in their daily lives. Study 2 contrasts functional versus cosmetic customization and their effects on product attachment and WTP, operationalized by a hypothetical product purchase situation corresponding to a typical mass customization online shop. A general discussion section highlights theoretical advancements and implications for marketing practice of both studies as well as limitations and future research questions.

2. Different Types of Consumer Participation

In general, consumer participation in the product production process is an issue of increasing research interest ([Atakan et al. \(2014a, 2014b\)](#); [Syam et al. 2008](#); [Norton et al. 2012](#); [Franke et al. 2010](#); [Mochon et al. 2012](#)). As already discussed in the introduction section, one central question is understanding the different psychological and experiential benefits on the consumers' side, which

go along with a higher economic value assigned to the product, and thus commercial value for marketers. In fact, the relevance of consumer participation with regard to different types of value for the consumer (e.g., experiential or economic) is not trivial and different motivations can play a role within specific types of consumer participation. For example, customizing one's sports shoes is probably motivated by envisioned benefits in experiential value, perfectly adjusting the product to one's individual preferences. Economic benefits are probably not relevant, given that customized products are usually not cheaper or even more expensive than non-customized products. In contrast to mass customization, DIY could well be motivated by economic considerations, since self-made goods can be cheaper than purchasing ready-made goods (e.g., a self-made wooden shelf). In other cases, consumers may engage in DIY because of the added experiential value—not only through the final individual product, but also because of the experiential value derived from the creation process (e.g., knitting a scarf). Such a discussion about motivations underlying a consumer's decision to engage in different types of consumer participation and the potential trading of different types of value is not the focus of the present research. However, an important point to acknowledge is that slightly different types of consumer participation can significantly vary in their benefits for the consumer, and that careful consideration is needed to actually understand the underlying motivations and psychological processes, which in the end also allows a strategic design from a marketing perspective.

In the following, we provide a deeper discussion of two particular design factors within the implementation of consumer participation, namely, self-design versus self-creation and functional versus cosmetic customization. While the former relates to the consumer dimension and the varying degree of effort invested, the latter relates to the product dimension and the kind of customizable product attributes. For both design factors, we also summarize previous findings and open questions with regard to product attachment, commercial value, and product use.

2.1. *Self-Design vs. Self-Creation*

As repeatedly shown, consumers tend to overvalue their own product creations and are willing to pay more for self-made products (Norton et al. 2012; Franke et al. 2010; Koster et al. 2015). Thus, irrespective of objective evaluation, the consumers' involvement into the production process seems to add special value to the final product. However, it is not yet fully understood how much actual involvement is required or is most desirable to create value for consumers. In general, the degree of consumer participation can refer to different levels of involvement, resulting in different types of effort on the consumer's side.

In the case of self-design, involvement remains at the level of mental effort. The consumer makes a choice about product attributes, but the producer takes charge of the practical realization. This is seen in the studies by Franke et al. (2010) on the "I designed it myself effect", where participants could customize t-shirts, scarves, or cell phone covers according to their personal preferences in the context of online mass customization toolkits. In the personalization continuum suggested by Miceli et al. (2007), this kind of consumer participation is characterized by high product variety but low interactional flexibility, and customer involvement in the late stage.

In the case of self-creation, consumer participation involves physical effort, as shown in the studies by Norton et al. (2012) on the "IKEA effect", where participants were building IKEA boxes, folding origami, and constructing sets of Legos. Self-creation can also combine physical and mental effort, as is typical for DIY kits. DIY kits equip the consumer with material to build and/or design a product with their own hands (e.g., t-shirts, stuffed animals, coffee mugs), which typically leaves more room for individual design ideas than building IKEA boxes based on instructions. Self-creation can also be a part of co-creation. Co-creation is a "customer-centric business strategy ... for the joint development of products and solutions between individual customers and manufacturers" (Berger et al. 2005, p. 1), also defined as the "joint creation of value by the company and the customer", starting in the early stages of product development (Prahalad and Ramaswamy 2004, p. 8). Co-creation may also include

several activities involving consumer participation in different phases, such as idea generation, design, production, and product adjustments (Jimenez Arevalo 2009).

In contrast to self-design, self-creation is characterized by high product variety as well, but also high interactional flexibility, and consumer involvement may start in earlier stages of the production process. Referring to the overview of customization benefits for consumers by Schreier (2006), one could assume special benefits of self-creation over self-design, given the consumers' more active role and effort invested, which could create more experiential value from the participation in the production process per se (i.e., higher process benefits), a higher uniqueness of the product, and also the pride of authorship might be more pronounced, if actually building the product with one's own hands. On the other hand, too much effort may not be what consumers actually want and need to feel positive about the product and themselves. If they just need the idea of self-made, as suggested by the studies by Koster et al. (2015), where false beliefs of self-creation led to an overvaluation of the product, the investment of mental effort in self-design might be enough and possibly even more beneficial, given that the result does not depend on the consumer's personal technical skills. In essence, a central question is whether physical effort, invested in the realization stage, adds extra value beyond the mental effort invested in the design stage.

First insights on the combined effects of consumer participation in the design stage and the realization stage were provided by Atakan et al. (2014a) suggesting that consumer engagement in both stages does not create value over and above the main effects created by a high level of participation in either stage. However, the used operationalizations were only limitedly comparable to common forms of consumer participation in the real world. For example, participation in the design stage was operationalized by designing a CD case as wanted using Power Point, which obviously allows more freedom and different opportunities than customizing single design factors in common forms of mass customization. Also, the study focused on measures of the product relationship (identification, attachment) and global evaluation, but did not include marketing-related measures of commercial value, such as WTP or WOM.

In summary, the involvement of consumers in the product production process appears to have potential on different levels, and has different levels of complexity. However, there has been little systematic investigation into the specific consequences of particular types of consumer participation so far and the effects on central outcome variables such as product attachment and WTP. From a marketing perspective, a central question is what degree of participation is sufficient to provide benefits, i.e., providing a sense of participation for consumers that adds extra value to the product they would pay for.

2.2. Functional vs. Cosmetic Customization

While opportunities for product customization can be applied in diverse product domains and to limitless product attributes, there is no easy categorization along the product dimension. As a very basic form of categorization, the hedonic/utilitarian differentiation of product attributes (Batra and Ahtola 1991; Crowley et al. 1992) provides a helpful classification scheme. Customized product attributes may be of a utilitarian or hedonic nature i.e., referring to product functionality or to non-functional, self-related product attributes such as visual design/beauty. In parallel to this, Marathe (2010) differentiates between functional customization, referring to task-related product changes (e.g., adding functions to toolbars to make a notebook more efficient), and cosmetic customization, referring to surface/presentation-related product changes, often associated with the expression of identity/user personality (e.g., choosing a wallpaper that fits personal tastes).

In particular, cosmetic customization has been discussed as a potential contributor to enhanced sense of identity (Marathe 2010) and product attachment (Mugge et al. 2009), which relates back to the general association of hedonic attributes with identification and self-expression (Hirschman and Holbrook 1982; Hassenzahl 2003). In general, material possessions are a central channel for consumers to define and express their identity to others (Berger and Heath 2007; Belk 1988; Piller and

Müller 2004) and customization additionally supports this expression of identity through products (Blom and Monk 2003; Franke and Schreier 2008; Franke et al. 2010). Expression of identity through products, in turn, also supports product attachment (Hassenzahl and Roto 2007) and “consumer love” (Ahuvia 2005; Ahuvia et al. 2009). As Ahuvia et al. (2009) discuss, consumers often talk about loving particular objects, and mean this literally, not only in a metaphorical sense. They also point out how beloved objects relate to identity and construction of the self in line with one’s ideals: “Since we construct our self in part through our choice of LOs [loved objects], it follows that we would choose LOs that allow us to become the person we want to be. Hence respondents sometimes projected their LOs as their ideal self rather than their actual self.” (Ahuvia et al. 2009, p. 347). Moreover, they found that the deepest and fullest experience of love was especially associated with objects helping consumers to meet higher-order needs such as social connection, existential meaning, or expression of ethical value, i.e., self-defining needs and values.

Not surprisingly, this kind of close attachment or even “love” for products seems to stem more from their self-related, hedonic than pragmatic, functional attributes, and thus, also more from cosmetic than functional customization. This also becomes visible in how people talk about their products. For example, in a study of consumer experience and choice of interactive technology, when talking about their attachment to products, participants referred to hedonic rather than utilitarian attributes (Diefenbach and Hassenzahl 2017). Some of the general benefits discussed in relation to product customization such as product uniqueness (Schreier 2006; Franke and Schreier 2008), have been primarily investigated and seem more likely to be induced by hedonic rather than utilitarian attributes. For example, Franke and Schreier (2008) explored the effect of mass customization on perceived product uniqueness using the example of a mass customization toolkit to design cell phone covers. When being asked after the self-design task in terms of what they liked about their self-designed product, only one (out of the 16 randomly selected participants being interviewed) referred to practical reasons for preferring a unique product, whereas most other participants emphasized the value of demonstrative differentiation from other consumers. All this speaks for a more pronounced effect of cosmetic rather than functional customization for product attachment.

Product attachment, in turn, has not only been discussed as an experiential value, but also has been associated with behavioral outcomes in the design literature such as more sustained product use. Given that products are often exchanged though they are still functioning, it has been repeatedly argued that prolonged use must not only be supported on a pragmatic level, but also through an emotionally intense product relationship, and approaches to enhance a product’s psychological lifetime are needed (Verbeek and Kockelkoren 1998; Lastovicka and Sirianni 2011). Since consumers experience an especially emotional relationship to customized products such as self-painted bikes (Mugge et al. 2009), letting the consumer participate in the design process may provide a chance to support attachment, and, in turn, prolong use. From this perspective, cosmetic customization might even be beneficial from a sustainability perspective. This line of reasoning, however, has been predominantly discussed in design philosophy and at the level of single design concepts (Blevis 2007; Verbeek 2010; Van Hinte 2004), without much empirical investigation or drawing a connection to opportunities through mass customization. In sum, an important question for empirical investigation is to what degree cosmetic and functional customization might differ in their effects, especially with regard to product attachment (as potentially relevant from a sustainability perspective), and commercial value (as of primary marketing interest) in parallel.

3. Research Questions and Hypotheses

The present research sheds light on different design factors within the implementation of consumer participation. It advances existing research by a more systematic investigation into the specific consequences of particular types of consumer participation and parallel investigation of central outcome variables from a consumer perspective (product attachment) and marketing perspective (commercial value). In addition, the present research takes a more holistic perspective on the effects of

consumer participation than most previous studies, also exploring further consequences of product attachment evoked for commercial value and sustained use of a product. From a theoretical perspective, it thus sheds light on the role of product attachment not only as an interesting outcome variable, but also as a potential mediator for variables of marketing interest as well as sustainability interest.

More specifically, we examine two scopes of consumer participation, namely, self-creation versus self-design in the consumer dimension (study 1) and functional versus cosmetic customization in the product dimension (study 2), both embedded in common real-world scenarios of consumer participation. While study 1 focuses on what degree of participation is required to evoke a surplus in product attachment and attributed commercial value, study 2 explores whether the positive effects of consumer participation are bound to specific attributes being customized, and whether hedonic attributes are more appropriate to create attachment. Each of the two studies thus highlights the consequences of specific design factors for consumer participation and provides a better understanding of their psychological consequences and their purposeful utilization for the most beneficial implementation of consumer participation (see Figure 1).

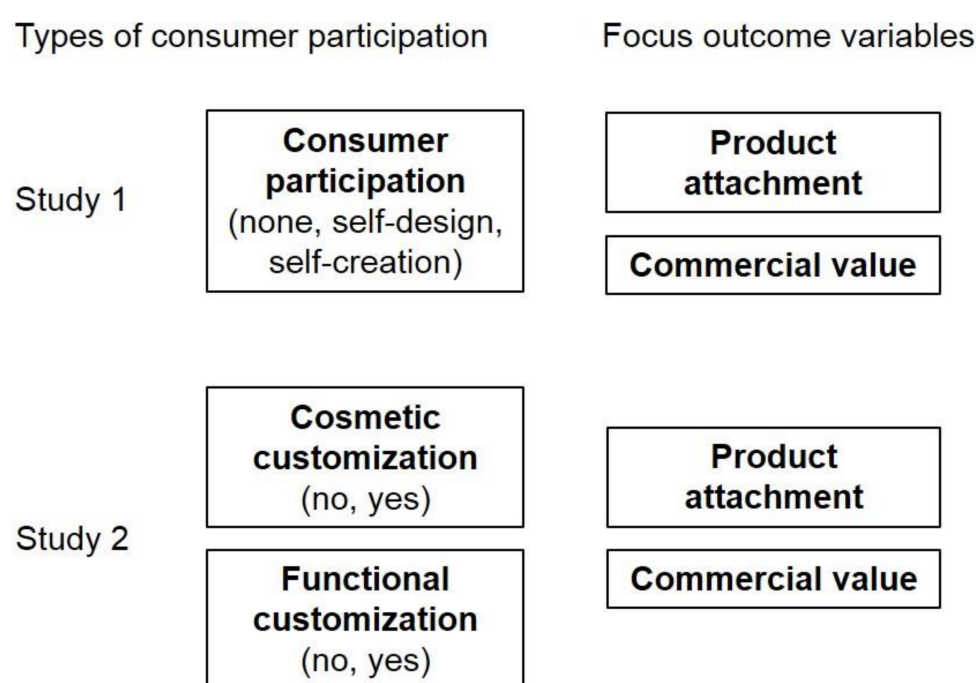


Figure 1. Study overview.

In addition to an exploratory interest into the consequences of different types of consumer participation, we derived assumptions about specific effects for single measures, based on theoretical considerations and previous findings in consumer psychology and human–computer interaction.

For study 1, we expected that different types of consumer participation would will evoke different experiences of involvement in the production process, with consequences for product attachment, commercial value, and sustained use. Compared to the control condition of a regular shopping scenario, where consumers can only choose a final product but do not participate in the production process, self-design should lead to enhanced mental effort (H1a), whereas self-creation should lead to enhanced mental and physical effort (H1b). In parallel to the previous research on personalized products and attachment (Mugge et al. 2009), as well as attachment, product value, and sustainability (Verbeek and Kockelkoren 1998; Lastovicka and Sirianni 2011), we expected both forms of consumer participation (self-design, self-creation) to increase emotional product attachment (H2), and positive correlations between product attachment and commercial value (H3a) as well as product attachment and sustained use (H3b).

For study 2, we expected cosmetic customization to be more important for product attachment than functional customization (H4). This hypothesis was based on the above discussed association of hedonic attributes with identification and self-expression (Hirschman and Holbrook 1982; Hassenzahl 2003), the association between cosmetic customization and sense of identity (Marathe 2010), and primarily self-related reasons for liking a self-designed product (Franke and Schreier 2008) as well as “loving” a product in general (Ahuvia et al. 2009). However, we expected both cosmetic and functional customization to enhance attributed commercial product value, operationalized as WTP (H5). Given that more features are associated with higher product capability—even though consumers may not actually use all of them (Thompson et al. 2005), the mere possibility of customizing product functions may also enhance the product’s assigned value.

4. Study 1: Self-Creation Versus Self-Design

4.1. Method

4.1.1. Participants and Procedure

In total, 106 individuals (82 female) aged between 17 and 47 years ($M = 23.79$; $SD = 6.03$) participated in the study at both measurement points. The first point of measurement (t1) was a laboratory study, carried out in single sessions. The second (t2) was a follow-up online survey via unipark (unipark.com), sent out to participants about four weeks later. The study was advertised as a study on product perception. Participants were recruited in the university context, and were informed that they would earn a cloth bag for their participation. In addition, students could gain two hours course credit. All participants provided their informed consent and were assured of anonymity and confidentiality. As a cover story for the laboratory session, participants were confronted with a humanoid robot (NAO robot). They interacted with the robot about three minutes and then filled out a questionnaire about their impression of it. The central study focus, however, was on the following part, where participants received the cloth bag. Consumer participation in the production process was varied as a three-level (none/control, self-design, self-creation) between-subjects factor. Participants were randomly assigned to one of the three experimental conditions. In the control condition, participants could choose between three bags, with pre-set motives and motive colors, corresponding to a regular shop without the opportunity for customization. The self-design condition corresponded to typical mass customization products, where the customer chose between different options for customization and then received the final product. Accordingly, participants could choose between three motifs for their bag, three motif colors, and five motif positions on the bag. By making use of motif stencils and textile color, the bag was created immediately by a study assistant according to the participant’s choice, and the final product was handed out to the participant. The self-creation condition corresponded to typical DIY products, where the customer was provided with a selection of materials to finalize the product. Accordingly, participants could create the bag design by making use of the same materials (motif stencils, textile color) as used in the self-design condition.

Several motivations played a role for the choice of a cloth bag for the operationalization of consumer participation. The main motivation was choosing an everyday product, being useful to a wide range of people and for many purposes, and not related to a specific target group. In addition, practical considerations with regards to the operationalization in our laboratory study played a role (i.e., being a product with potential for self-creation in a reasonable time frame and cost range). Finally, since our study did not only explore the instant evaluation of the product but also its sustained use, the product of study should bear the potential for more or less frequent use in daily life and thereby countable variance. For less interactive and decorative products such as IKEA boxes, folded origami, or built sets of Legos (Norton et al. 2012), as used in previous studies on consumer participation, frequency of usage and potential effects to sustained use would be difficult to define.

After receiving the cloth bag, participants of all three experimental conditions filled out a first questionnaire right away (t1) and the online survey about four weeks later (t2). The latter survey also

informed participants about the actual study focus on consumer participation. The two questionnaires on consumer participation and product perception consisted of different measures, as described in the next paragraph.

4.1.2. Measures

The perceived effort invested in the production process was assessed at t1. Based on [Atakan et al. \(2014a\)](#), three items assessed physical effort (e.g., invested physical energy, $\alpha = 0.82$) and three items assessed mental effort (e.g., invested creativity, $\alpha = 0.90$) on a seven-point scale (1 = not at all, 7 = very much).

Product attachment was assessed at t1 and t2 by the product attachment scale ([Schifferstein and Zwartkruis-Pelgrim 2008](#)). Participants indicated their opinion on eight statements with respect to product attachment (e.g., “This bag means a lot to me”) on a seven-point scale (1 = strongly disagree, 7 = strongly agree). Items were related to the product’s irreplaceability, i.e., the symbolic meaning to its owner that is not present in other products, even when they are physically identical ([Schifferstein and Zwartkruis-Pelgrim 2008](#), p. 2), and the experienced attachment, i.e., the “strength of the emotional bond a consumer experiences with a durable product” ([Schifferstein and Zwartkruis-Pelgrim 2008](#), p. 1). A global score of product attachment was calculated by averaging all items (t1: $\alpha = 0.92$, t2: $\alpha = 0.93$).

Commercial value was assessed by two measures, WTP and WOM. WTP was assessed in euros by a single item, “How much would you be willing to pay for this bag?”. WOM was assessed by three items (e.g., “To what extent is it likely that you recommend the bag to others in person?”, $\alpha = 0.80$) as suggested by [Eisingerich et al. \(2015\)](#). Sustained use was assessed by a single item (“How likely is it that you will still use this bag three months later?”) on a seven-point scale (1 = very unlikely, 7 = very likely). Both commercial value and sustained use were assessed at t2, about four weeks after receiving the bag.

4.2. Results and Discussion

As expected in H1, a one-way ANOVA revealed significant differences between the three conditions of consumer participation in perceived mental effort ($F(2, 103) = 38.38, p < 0.001$) and physical effort ($F(2, 103) = 95.58, p < 0.001$). In the control condition, both mental and physical effort were low. In the self-design condition, mental effort was enhanced, but physical effort remained at a low level. In the self-creation condition, both physical and mental effort were at an enhanced level (see Figure 2a). Post hoc Fisher’s Least Significant Difference (LSD) tests confirmed the differences between the single conditions as significant. Note, however, that all effort mean values are still below the neutral scale midpoint (=4), indicating that the task was not experienced as extremely demanding with respect to mental or physical skills.

An analysis of variance with consumer participation (none, self-design, self-creation) as the between-subjects factor, time of assessment (t1, t2) as the within-subjects factor, and product attachment as the dependent variable revealed a main effect of the time of assessment ($F(1, 103) = 14.22, p < 0.001$) and in line with H2, a main effect of the form of consumer participation ($F(2, 103) = 5.06, p < 0.001$). There was no interaction effect. As shown in Figure 2b, product attachment was generally higher at t1 compared to t2. Moreover, product attachment was higher when participants were involved in the production process (self-design, self-creation), than if they were not (control condition). Post hoc Fishers’s LSD tests confirmed significant differences to the control condition for both forms of consumer participation (self-design, self-creation) but no significant differences between self-design and self-creation. Thus, being involved in the production process evoked a raise in product attachment, independent of the particular form of consumer participation.

The WTP ranged between €0 and €15, the mean value was €3.40 (SD = 3.26) and the median value was €3.00. The mean value of WOM was 3.48 (SD = 1.40) which is significantly below the neutral scale midpoint, $T(105) = 3.80, p < 0.001$. The mean rating for sustained use was 5.23 (SD= 1.89), which is significantly above the neutral scale midpoint, $T(105) = 3.80, p < 0.001$. Thus, while for most

participants the bag had some value (only 17% declared they would not pay anything for it), and the majority planned to keep using it in the future (only 18% scored below the scale midpoint), the bag was not a product they would necessarily recommend to others (60% scored below the scale midpoint).

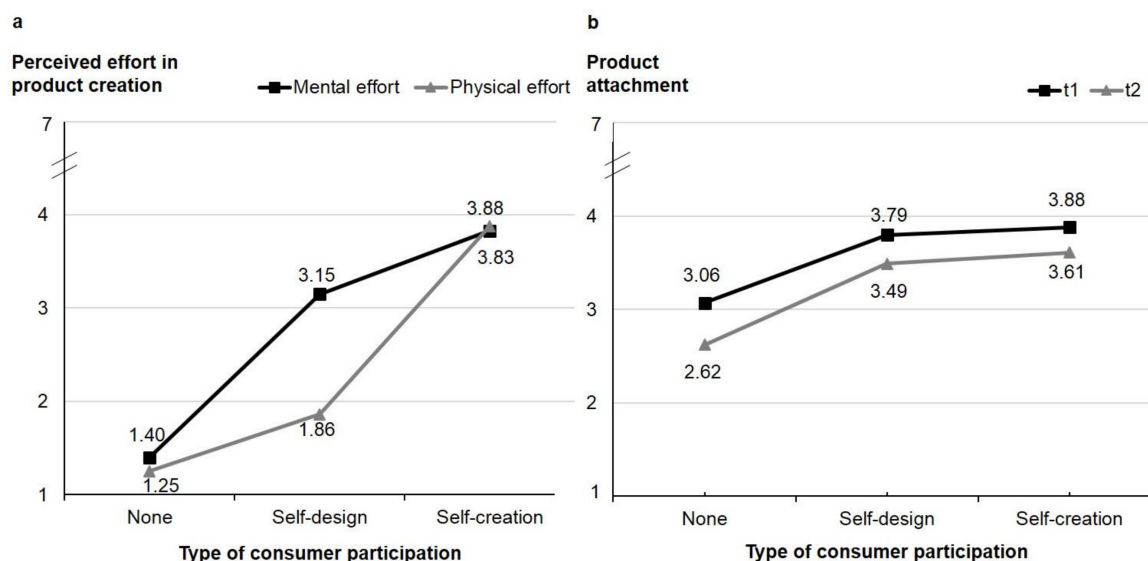


Figure 2. Effects of different types of consumer participation on (a) perceived mental and physical effort in product creation and (b) product attachment at time points t1 and t2.

A correlational analysis of the measures surveyed at t2 showed high correlations between product attachment and both measures of product value (H3a), i.e., WTP ($r = 0.52$, $p < 0.001$) and WOM ($r = 0.60$, $p < 0.001$), and a medium correlation between product attachment and sustained use (H3b, $r = 0.21$, $p < 0.05$). Emotional product attachment thus seems to be a valuable source from a vendor's perspective. People are more likely to recommend and pay more for a product they feel emotionally attached to. Product attachment may also go along with prolonged usage (intentions), but the correlation is smaller. Additional analyses tested whether the positive effect of attachment on product value and sustained use can be traced back to the consumer participation and the perceived effort during the production process. A one-way ANOVA revealed no significant effects of consumer participation on WTP, WOM, or sustained use. However, perceived mental and physical effort were positively correlated to WTP (mental: $r = 0.39$, $p < 0.001$, physical: $r = 0.37$, $p < 0.001$) and WOM (mental: $r = 0.29$, $p < 0.01$, physical: $r = 0.25$, $p < 0.05$). Linear regressions and mediation analyses further explored the relationships between effort and WTP/WOM and the potential mediating role of product attachment. Figure 3 shows beta coefficients for the mediation models for WTP (Figure 3a) and WOM (Figure 3b).

This shows that the effect of mental effort was fully mediated via product attachment. Without considering product attachment as a mediator, mental effort was a significant predictor of WTP ($\beta = 0.39$, $T = 4.30$, $p < 0.001$) and WOM ($\beta = 0.29$, $T = 3.04$, $p < 0.01$). However, when included in the regression with the mediator (i.e., product attachment), mental effort was no longer a significant predictor of WTP ($\beta = 0.17$, $T = 1.79$, $p = 0.08$), but product attachment was ($\beta = 0.43$, $T = 4.52$, $p < 0.001$). A mediation test with bootstrapping and 5000 replications showed a significant mediation as the 95% confidence interval [CI] = [0.253; 0.733] did not include zero. Sobel's Z was also significant ($Z = 3.56$, $p < 0.001$), further proving the existence of the mediation effect for WTP. In parallel to this, mental effort was no longer a significant predictor of WOM ($\beta = -0.02$, $T = -0.23$, $p = 0.82$) when the mediator was included, but product attachment was ($\beta = 0.61$, $T = 6.71$, $p < 0.001$). Again, the 95% CI = [0.162; 0.404] did not include zero and Sobel's Z was significant ($Z = 4.41$, $p < 0.001$).

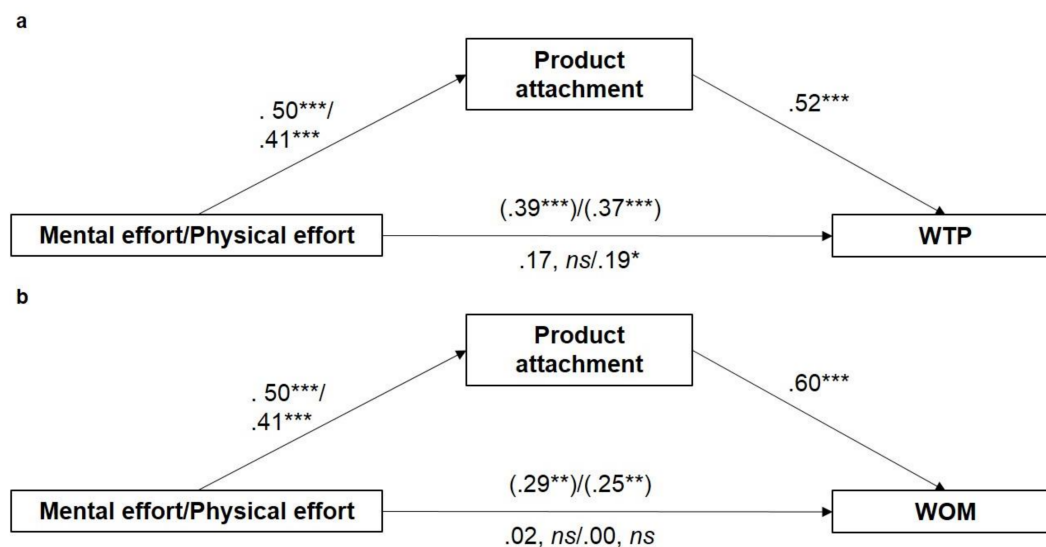


Figure 3. Beta coefficients for mediation models for WTP (a) and WOM (b). Values in parentheses represent total effects. Note: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. WTP: willingness to pay; WOM: word-of-mouth.

For physical effort, there was a partial mediation via product attachment for WTP and a full mediation for WOM. Without considering product attachment as a mediator, physical effort was a significant predictor of WTP ($\beta = 0.37$, $T = 4.10$, $p < 0.001$) and WOM ($\beta = 0.25$, $T = 2.59$, $p < 0.01$). When included in the regression with the mediator, the effect of physical effort on WTP was weaker ($\beta = 0.19$, $T = 2.15$, $p < 0.05$), and product attachment was the more important predictor ($\beta = 0.44$, $T = 4.89$, $p < 0.001$). The mediation effect was further confirmed by the 95% CI = [0.234; 0.679] and Sobel's Z ($Z = 3.29$, $p < 0.001$). For WOM, physical effort was no longer a significant predictor ($\beta = 0.00$, $T = 0.03$, $p = 0.98$) when the mediator was included, but product attachment was ($\beta = 0.60$, $T = 6.95$, $p < 0.001$). Again, the 95% CI = [0.136; 0.382] did not include zero and Sobel's Z was significant ($Z = 3.78$, $p < 0.001$).

In sum, product attachment was thus generally higher when participants were involved in the production process (self-design, self-creation), than if they were not (control condition). Beyond this, the present detailed analyses provide a more differentiated picture of the potential of variable types of consumer participation. Altogether, the type of consumer participation appeared as less relevant for attachment than the subjective perceived effort. In line with previous studies highlighting consumers' subjective feeling of "being the originator" as a main reason for product value (Franke et al. 2010), the perceived effort during the production process was positively correlated to the WTP for the product and recommending it to others (WOM). However, this feeling could be induced by both types of consumer participation, i.e., self-design and self-creation showed equally positive effects on product attachment. In other words, self-design is sufficient to create a sense of attachment and provide a basis for an emotionally intense product relationship, whereas physical involvement of the consumer in the creation process was not needed.

While study 1 focused on effects of self-design versus self-creation, characterized by varying degrees of mental and physical effort for the consumer, and their effects on product attachment and commercial value, study 2 further explored product-related variations within self-design and contrasted the customization of pragmatic versus hedonic attributes (i.e., functional vs. cosmetic customization).

5. Study 2: Functional Versus Cosmetic Customization

5.1. Method

5.1.1. Participants and Procedure

In total, 272 individuals (186 female) aged between 18 and 65 years ($m = 27.58$, $SD = 8.77$) took part in the study. The study was carried out online with soscisurvey (soscisurvey.de), and participation took about 15 min. Again, the study was advertised broadly as a “study on product perception”. An invitation link to the study was distributed via diverse mailing lists and university panels. As an incentive, three Amazon gift vouchers (€20) were raffled among all participants who completed the survey.

Before starting the survey, all participants provided their informed consent via a tick box on the first page on the online questionnaire and were assured of anonymity and confidentiality. The experimental scenario asked participants to make a hypothetical choice of their preferred smartphone. Depending on the experimental conditions, participants had the opportunity to customize the smartphone or not. More specifically, the study design consisted of two two-level between-subjects factors: cosmetic customization (no, yes) and functional customization (no, yes). Participants were randomly assigned to one of the four resulting experimental conditions. The control condition (no cosmetic, no functional customization) corresponded to a regular online shop, without the opportunity for customization. Participants could choose between six different smartphones (current models in a comparable price range), each presented by a feature list and a picture. The customization conditions corresponded to a mass customization online shop (i.e., Motorola’s moto maker), where participants saw pictures of the smartphone from different angles and could see how their choices affected the final product. In the cosmetic customization conditions, participants could customize four design attributes: front case color (black, white), back case color (black, white, blue, red, pink, turquoise, grey, wood), front case accent color (grey, silver, gold, bronze), and a gravure for the back case. In the functional customization conditions, participants could customize eight functional attributes (e.g., operating system, display resolution, battery capacity), each with three options to choose from. Similar to study 1, one consideration for the choice of a smartphone for the operationalization of consumer participation was that it builds a product of relevance to a wide population. The choice of a smartphone thus built a plausible task to study the effects of customization, and the real existence of web shops offering customized smartphones underlines the ecological validity of the study design. Moreover, a smartphone is a product where hedonic and utilitarian attributes are both of general relevance, so that both types of customization, functional as well as cosmetic customization, form reasonable activities. Such a contrast of functional versus cosmetic customization would have been less adequate for products which per se have a strong relation to one of the dimensions, such as jewelry being primarily related to the hedonic/cosmetic customization, or a dishwasher being primarily related to the utilitarian/functional customization (for a broader discussion see also [Diefenbach et al. \(2014\)](#)).

After they had made their choice, participants rated the degree of product attachment and product value as described in the next paragraph. Since study 2 did not include actually using the customized product and only focused on product assessment at one point in time, sustained use was not assessed.

5.1.2. Measures

Product attachment was assessed with the sense of identity scale ([Marathe 2010](#)). It consists of seven items (e.g., “The product reflects my personal identity”, “I feel ownership toward the product”), and participants stated their consent on a seven-point scale (1 = strongly disagree, 7 = strongly agree). A score value was calculated by averaging all items ($\alpha = 0.87$). We did not use the same measure as in study 1 here, since the scale by [Schifferstein and Zwartkruis-Pelgrim \(2008\)](#) and its focus on aspects such as irreplaceability is more suited for attachment to actually owned products and their effects over time. Instead, we used product identification as a proxy, which is more suitable for a quick assessment

of the spontaneous sense of ownership and bonding. WTP was again assessed in euros by a single item, i.e., “How much would you be willing to pay for this smartphone?”.

5.2. Results and Discussion

A two-way ANOVA tested the effects of cosmetic and functional customization on attachment. In line with H4, there was a main effect of cosmetic customization ($F(1, 268) = 4.55, p < 0.05$) but no main effect of functional customization. Product attachment was generally stronger when participants were given the opportunity for cosmetic customization ($m = 3.92, SD = 1.30$), than if they were not ($m = 3.60, SD = 1.29$). In addition, also the interaction effect between cosmetic and functional customization was significant ($F(1, 268) = 4.12; p < 0.05$). As shown in Figure 4a both forms of customization in combination lead to the highest degree of attachment and the lowest degree of attachment occurs when functional customization is given, but cosmetic customization is not.

A second two-way ANOVA tested the effects of cosmetic and functional customization on WTP. As expected in H5, there was a main effect of functional customization. WTP was generally higher when participants were given the opportunity for functional customization ($m = €304.43, SD = 137.14$), than if they were not ($m = €255.34, SD = 139.54$). However, other than expected, there was no main effect of cosmetic customization on WTP but an interaction effect of the two forms of customization. In parallel to attachment, both forms of customization together lead to the highest WTP, and the lowest value occurs if only one form of customization is given (here: cosmetic customization) but the other is not (see Figure 4b).

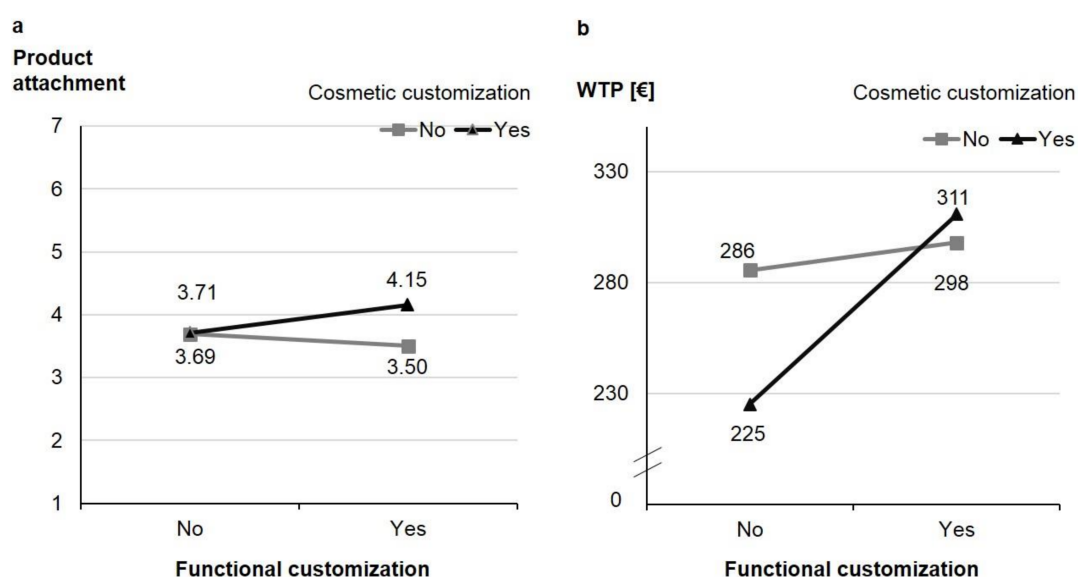


Figure 4. Effects of cosmetic and functional customization on (a) product attachment and (b) WTP.

In sum, cosmetic customization appeared as more relevant for attachment and functional customization as more relevant for WTP. For both measures, the combination of both cosmetic and functional customization appeared to be the most effective. Interestingly, the mean values also indicated a contrast effect, i.e., lower values if only one opportunity for customization is given, than if none is given. One interpretation could be that the opportunity to customize activates a general awareness for the consideration of personal preferences in the production process. This awareness, however, only has positive effects if the “right” attributes can be customized. Otherwise, the effect is negative rather than positive. For attachment (primarily supported by cosmetic/hedonic attributes) functional customization alone leads to lower values than no customization at all. For WTP (primarily boosted by functional attributes) cosmetic customization alone leads to lower values than no customization at all.

6. General Discussion

In the following, we first highlight the two studies' theoretical and practical contributions, and then discuss limitations and subsequent questions for future research.

6.1. Study 1

Study 1 shed light on the specific effects of different degrees of consumer participation and the related effort on the consumers' side as well as product attachment as a potential mediator of product value. More specifically, study 1 contrasted self-design, only involving mental effort, versus self-creation, also involving physical effort. In fact, the induced product attachment appeared as a critical factor for consumers' willingness to pay and give recommendations to others. This insight provides an important theoretical advancement beyond previous studies, shedding light on the interplay of consumers' invested effort in the product process and attributed commercial value, as well as product attachment as a mediator. While previous studies either only discussed such relations as a potential explanation for higher WTP for self-designed products (e.g., [Norton et al. 2012](#)) or focused only on consumers' subjective product evaluations but not commercial value ([Atakan et al. \(2014a, 2014b\)](#)), the present research also demonstrated such relations empirically for marketing-related outcome variables such as WTP and WOM. As a practical implication, this suggests that marketers would be wise to pay more attention to what allows consumers to build a bond with a product, and consumer participation appears to be one such opportunity, as shown by the higher levels of attachment for self-designed and self-created products as compared to the control condition.

However, the fact that subjective perceived effort appeared as even more relevant for attachment than the type of consumer participation also highlights the importance of considering the potential of consumer participation from the perspective of its psychological consequences. Besides the opportunity for participation as a prerequisite for felt effort, the question of how much consumers actually feel involved in the production process, i.e., the perceived effort, is crucially relevant for attachment and resulting quality attributions. Again, the gained insights on a theoretical level also suggest practical implications for marketers. If successfully boosting product attachment, even using small customizations with relatively low costs during the production process (i.e., mass customization), may result in a considerable advantage over competitors, given that the positive effect of mental effort on WTP and WOM was similar or even slightly better than that of mental and physical effort in combination.

6.2. Study 2

Study 2 explored another relevant influencing factor of attachment in the context of consumer participation, i.e., the product attributes being customized. More specifically, study 2 explored the specific and combined effects of cosmetic and functional customization. As expected, cosmetic customization appeared to be a more effective booster of product attachment, indicated by a main effect of cosmetic but not functional customization. For WTP, however, functional customization appeared to be more relevant, indicated by the main effect of functional but not cosmetic customization. In addition, for both measures (product attachment and WTP), there was an interaction effect between cosmetic and functional customization, and the combination of both opportunities to customize the smartphone led to the highest values. More interestingly, for particular measures, the pattern of mean values indicated contrast effects, i.e., lower values if only one opportunity for customization is given, as compared to when none is given. As noted above, the opportunity for customization as such may serve as a general trigger to reflect on individual preferences and attributes one would like to change in order to adjust the product in line with one's preferences. If, however, the actual given opportunities for customization do not refer to those kinds of attributes that one sees as most preferable to change and only the "wrong" attributes can be affected, the opportunity and reflection on customization may

result in more negative ratings for the product than if the issue of customization was not activated at all. Depending on the measure, different product attributes might appear as the “right” or “wrong” attributes to customize. For attachment, primarily supported by cosmetic/hedonic attributes, these are the right attributes to customize. Thus, the opportunity to customize cosmetic attributes is beneficial to attachment, whereas the opportunity to customize only functional attributes is more destructive than no customization at all. For WTP, primarily boosted by functional attributes, these are the right attributes to customize. Consequently, the opportunity to customize functional attributes is beneficial to WTP, whereas the opportunity to customize only cosmetic attributes is more destructive.

From a theoretical and research perspective, such findings highlight the general need to investigate the differentiated consequences of customization for different variables of consumer value. Depending on which exact measure one picks, results can vary or even seem contradictory. Though product attachment and WTP both express some positive valuation, the two measures may imply a focus on different product attributes, and thus will also be affected to a different degree by opportunities for customization. From a marketing perspective, the present hints of contrast effects highlight the complexity of creating successful customization offerings and avoiding unwanted consequences. Though consumers value the opportunity to customize their products, they may also become more aware of what they still cannot customize.

6.3. Limitations and Future Research

Besides a more comprehensive understanding of the consequences of different types of consumer participation and related practical implications, the present studies are subject to some limitations and highlight interesting aspects for future research. First, some basic limitations need to be discussed with regards to the present study designs and used operationalizations of consumer participation. Obviously, the different experimental conditions only represent a simplified form and limited selection of the wide variety of current opportunities for consumer participation on the market. Further studies in other domains are necessary, preferably longitudinal studies across larger time spans. In addition, it could be studied as to whether the same pattern of results can be revealed for larger and long-lasting goods, e.g., self-design versus self-creation of furniture or the whole kitchen, with the option to customize functional (e.g., worktop height) or cosmetic (e.g., color) attributes. Moreover, the present study designs cannot totally rule out confounding factors such as, for example, the impact of choice variety per se being confounded with the type of consumer participation. For study 1, in the control condition participants were confronted with a more limited set of choice options (i.e., three products to choose from) than in the self-design and self-creation conditions, where participants could make up a number of different combinations. We could have provided a higher number of options to choose from in the control condition also (e.g., a choice set consisting of all possible combinations of motifs and color). However, we refrained from this and decided for a limited number of options in the control condition for the sake of ecological validity, mirroring a typical real-life choice situation. In general, the number of non-customized products available (e.g., different design variants of one sports shoe) is lower than the hypothetical number of different options in mass customization (e.g., different design variants of one type of sports shoe users can create on miadidas.com). Another limitation is the use of a hypothetical choice scenario in study 2. Studying hypothetical choice is a common practice in consumer research, and studies repeatedly showed that there are no major differences between hypothetical and real trading, as seen for example in studies on the endowment effect ([Horowitz and McConnell 2002](#)). There also is no apparent assumption as to in which direction making a hypothetical instead of a real product choice might have affected and biased the present findings. Nevertheless, future research should expand studies on cosmetic versus functional customization and its effects on product attachment and other variables to real choice situations. Finally, while the combined findings of our two studies suggest that the kind of product attributes consumers can affect is more important than whether they do this on a mental or physical level, future research needs to combine both aspects in one study to come to definite conclusions. Thus, future research is necessary to assure

the broader validity of the present findings and provide a more profound basis for generalizations. Finally, it must be noted that the operationalizations of consumer participation within the present study settings only represent a small selection of the potential range of products and product categories that can be subject to consumer participation. Depending on the product category, price level, and involvement, different psychological processes may be relevant in varying degrees. For example, previous studies found that the relevance of hedonic product quality for product attachment increases the more products become integrated in daily life, especially products “you are daily faced with” (Diefenbach and Hassenzehl 2017). This probably applies more to smartphones and other long-term investments than to cloth bags or other products with low involvement in a similar price range. The product category and level of involvement could thus be relevant moderators for the present findings with respect to the customization of hedonic product attributes, and future studies could look at such effects by systematic comparisons between product categories. Moreover, the relevance of customization could further be moderated by individual factors such as age and generational differences. As one reviewer of this paper noted, “a Baby Boomer might not necessarily want to have any input into the customization (functional or cosmetic) of their mobile phone, but a Millennial might be the opposite.”

In addition to a general exploration of further influencing factors regarding person and product type and study settings of higher internal and ecological validity, future studies could pick up some of the interesting psychological phenomena revealed by the present research. This for instance includes gaining more insights into potential “backfire effects of consumer participation”. For example, study 2 gave evidence of potential negative effects in consumer participation if consumers feel they can adjust the product attributes too little or only the wrong product attributes can be changed. Future research is needed to come to definite conclusions about the existence of such effects. It is important to note that in the present study, even when having far fewer options than provided through the different combinations in the customization conditions, participants in the control condition also had some choice (i.e., between six phones). For more profound insights into potential contrast effects, future studies should also compare customization conditions against a no-choice condition (i.e., just one fixed product). Referring to study 1, an important question for future studies is what can be done to increase customers’ perceived contributions with respect to their participation in the production process, to actually have a positive effect on commercial value. However, pointing at potential backfire effects, the question is as to whether this is a linear relationship, i.e., the higher the subjective contribution, the more commercial value, or whether too much of a perceived contribution on the consumer’s side could backfire and diminish the commercial value. In fact, previous research contrasting different (hypothetical) scenarios of customer participation in co-production (Bendapudi and Leone 2003) has already revealed self-serving bias in the context of consumer participation, with a negative impact on customer satisfaction. Customers allocate the credit for a positive outcome to themselves rather than the company: when an outcome is better than expected, customers who participate in production with the firm are less satisfied with the firm than customers who do not participate in production. In contrast, customers who participate in the production are less likely to take responsibility for a bad outcome. If consumers overvalue their own contribution and transfer the whole credit to themselves, this could diminish benefits for the company. In consideration of such self-serving effects, a central challenge seems to find a good balance which highlights the consumer’s and the company’s contributions to the resulting positive product experience at the same time. Hence, from a marketing perspective, it seems important to acknowledge the interplay between both the consumers’ participation and efforts, and the company’s contribution in enabling this. A similar example could be seen in the recent Apple advertising campaign showing beautiful pictures shot by the iPhone camera. The advertising posters value the consumer’s contribution and mention his or her name (e.g., “Nicki’s holiday pictures”), but in even bigger letters it says “shot with the iPhone”.

Also, study 1 lent first empirical indications with respect to the idea of consumer participation and product attachment as a chance for sustainability. This finding, however, must be regarded

as preliminary, given that sustained use was only measured with one item asking for consumers' estimations of future usage behavior, and not actual usage or future product replacement. Future studies must deliver deeper insights into different sustainability-related variables and long-term usage behavior, and may also explore the integration of customization as a sustainability statement in product promotion and strategic company communication, as well as in the context of corporate social responsibility (CSR).

Finally, an interesting pattern revealed in study 1 is that even though participants valued the bag and intended to keep on using it, WOM was relatively low. It could be that because the product is so well customized to one's personal desires, it may not fit others' preferences. Even if one considers that others would customize the product to their own preferences, people may still see the general value of customization as something very personal that may not be comprehensible for others, as occurs with the personal and self-referential value of hedonic attributes (e.g., beauty, design) in general (Diefenbach and Hassenzahl 2011). Thus, an interesting question for future research is whether the gap between personal valuation (WTP, own usage) and other oriented types of valuation (WOM) varies between cosmetic and functional customization. What might be done to enable a more abstract representation of one's own positive product experience (that can be transferred to a vision of a positive experience for others as well) should also be studied. Again, this underlines the need for a thorough understanding of the complex consequences of different types of consumer participation to exploit its potential and maximize perceived product value from a holistic perspective. In conclusion, the present studies thus provided important insights into the "secret of self-made products" but also revealed a number of facets of this phenomenon that are yet to be discovered.

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