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Consumer participation in the design and realization stages of production: How self-production shapes consumer evaluations and relationships to products

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ABSTRACT

Psychological responses of consumers to specific stages of self-production activities are investigated in four studies. Findings reveal that consumer participation in the realization stage (physical production) enhances affective commitment to the product. However, physical production without opportunity to express choice or creativity during the production process does not change the symbolic meaning of the product (how self-expressive it is) and, therefore, does not result in identification with the product. Participation during the design stage (input-specification) enhances identification, leading to affective commitment, which in turn enhances evaluation of the self-made product. Finally, engaging consumers in both the realization and design stages of the production process does not create value for consumers over and above the main effects created by a high level of participation in either stage.

1. Introduction

Self-production in consumption, the active engagement in the creation of end products by consumers, is increasingly common as companies develop more ways for consumers to participate in the production process. It enhances not only the potential input of innovative ideas, but also the subjective valuation of one's self-produced items. When consumers play an active role in the production of products, they come to overvalue their own creations (Norton, Mochon, & Ariely, 2012).

Production consists of design (specification of input), realization (manufacturing, throughput), and use, according to the service systems perspective (Lengnick-Hall, 1996; Van Raaij & Pruyn, 1998). The present paper focuses on consumers' participation in the design and realization stages of production. During the design stage, characteristics of the product or service (e.g., physical layout, design, quality) are decided on. During the realization stage, the actual creation and execution of the product or service take place. Consumers' participation in self-production primarily takes place at the design stage (such as while designing a t-shirt on a website or kitchen layout for a new home) or the realization stage (such as while assembling furniture using step-by-step instructions or cooking using a dinner kit). In some instances, consumers engage in both steps of self-production, both designing and physically creating the product.

The form of the self-production activities and the type of control consumers have over the products often vary between the design and realization stages. In the design stage, consumers engage in activities that require them to create, choose, or specify the form, layout, colors, and so on. They are mostly intellectually involved in the creation process and control the representational outcome as they specify the attributes. In the realization stage, consumers physically interact with the input materials and exert physical effort to create the product. They exercise manual control and power over the product during its creation. Also, to the extent that consumers physically shape the product, they are exposed to haptic cues in the process. Given these differences in the nature of consumer participation in design versus realization stages of production, an important question is how consumers' relationships with, and evaluation of, self-made products are differentially shaped during the two stages.

Our present research distinguishes between the design and realization stages, which at a first glance, seem to overlap with Buechel and Janiszewski's (2014) distinction between customization and physical assembly activities. However, there are key differences between our work and Buechel and Janiszewski's studies. We focus on the specific effects of each type of the self-production process (design vs. realization) on person–object relationship and valuation of the completed end-product. In particular, we investigate the underlying mechanisms governing final product evaluation (i.e., identification and affective commitment) by fully separating and integrating the two different stages of self-production activities. By contrast, Buechel and Janiszewski focus on the valuation of input materials in kits as function of the timing of the design decision (i.e., before or during the realization process);

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they do not manipulate actual physical effort exerted during assembly (i.e., realization).

We propose and test whether the psychological processes that shape consumers' evaluations depend on the production stage or type of activities that consumers engage in during self-production. Some research has examined self-design (e.g., Franke, Schreier, & Kaiser, 2010; Fuchs, Prandelli, & Schreier, 2010; Moreau & Herd, 2010), while other studies have scrutinized realization (e.g., Norton et al., 2012; Troye & Supphellen, 2012). We draw upon both streams of research and explore why and how consumer participation in design and realization stages shapes what the self-produced product means to consumers.

The rest of the paper proceeds as follows. First, we review extant findings from several literature streams, including research on the person–object relationship, extended self, and self-production. Then, we draw on touch, self-design, and organizational behavior literatures to develop our theoretical arguments, and from this generate predictions to be tested. We present four studies examining how consumers relate to self-made products as a result of participating in different stages of self-production. Study 1 focuses on the realization stage; Study 2 scrutinizes the design stage; and Studies 3A and 3B investigate whether involvement in both stages creates value for consumers, over and beyond that created by participation in either stage alone. Finally, we consider how our findings add to a better understanding of consumers and conclude by discussing implications and suggested avenues for future research.

2. Conceptual framework and research hypotheses

2.1. Psychological responses to participation in the production of products

Research on person–object relationships (Belk, 1988; Pierce, Kostova, & Dirks, 2003) indicates that creating, shaping, or physically producing a product result in powerful associations between the self and the product. The product becomes part of the extended-self due to the labor, time, and values invested into it. A product that has taken one's effort, attention and time becomes integrated into the self, since it has grown or emerged from the self (Csikszentmihalyi & Rochberg-Halton, 1981). People tend to exhibit emotional reactions to products and form feelings of attachment to objects that are connected to the self (Belk, 1988; Kleine, Kleine, & Allen, 1995). In addition to affect-laden aspects of product–self relationship, symbolic meanings of the product–self relationship contribute to one's self-concept (Grubb & Grathwohl, 1967; Kleine, Kleine, & Kernan, 1993; Atakan, Bagozzi, & Yoon, 2014). People continually compare their self-identity to the image of products and accommodate and assimilate ones that have similar or desired identities to their self-concept. During the self-production process, the product is formed in the image of its creator, revealing his tastes, preferences, and identity. The product gains symbolic meaning as a result of self-production and starts to reflect one's identity to the self as well as the outside world. Hence, the creator comes to identify with the self-made product, especially so with a self-expressive one, which self-production fosters.

Previous research suggests that people exhibit emotional reactions (affective commitment), and/or cognitively compare their identities (identification), to self-made products. In fact, Bloch (1995), in a theoretical paper, suggests that consumers may exhibit cognitive and/or affective responses to product design. However, to the best of our knowledge, no empirical research to date has investigated the dimensions of person–object relationships in the context of self-production.

Several literatures, including psychology, marketing, and organizational behavior, have conceived of emotional connections between consumers and animate or inanimate objects, such as people, groups, ideas, brands, or products. For instance, attachment theory (Bowlby, 1969; Ainsworth & Bowlby, 1991; Hazan & Shaver, 1994) informs our understanding of the emotional connection between an infant and a parent, as well as the romantic relationship between partners. It predicts relationship quality and functioning and indicates that physical contact has important positive implications for close relationships. One line of research on brand attachment within marketing utilizes attachment theory to conceptualize the relationship between consumers and brands as comprising both cognitive and emotional bonds. These bonds reflect connections developed over a relatively long time span (Park, MacInnis, & Priester, 2008). In a somewhat similar approach, Aaker, Fournier, and Brasel (2004) investigate brand–consumer relationships and discuss sincere (warm and caring) as well as exciting brands (see also Batra, Ahuvia, & Bagozzi, 2012).

Another tradition looks at person–product relationships but more specifically considers how an object helps consumers define and maintain a sense of self. Ball and Tasaki (1992) propose the term, "product attachment", and define it as the extent to which an object is used to maintain a cognitive structure of self. It is similar to the conceptualization posited by Kleine et al. (1995), who regard attachment as a reflection of the extent of "me-ness" associated with the product. Both traditions imply that product attachment is identical to self-extension and consists of cognitive (e.g., identity, a sign of self-worth) as well as affective (e.g., feelings associated with the product) components. Our conceptualization of affective commitment differs from this overall encompassing conceptualization and is more in line with the tradition of social identity research in the social psychology and organizational behavior literatures.

Research in social psychology and organizational behavior (Tajfel, 1978; Turner, 1985) informs our understanding of the relationship between individuals and groups or institutions. This literature makes a distinction between affective and cognitive components of organizational or group membership (Bergami & Bagozzi, 2000; Ellemers, Kortekaas, & Ouwerkerk, 1999). The affective component refers to the sense of belongingness, emotional involvement, and attachment to the target object (Allen & Meyer, 1990; Bergami & Bagozzi, 2000). It is measured with items such as "having a strong sense of belonging," and "feeling emotionally attached" (Allen & Meyer, 1990). The greater is the felt belongingness, the greater the affective commitment. The cognitive component, on the other hand, refers to a form of identification whereby a person comes to view himself as a member of the focal entity. This happens through cognitive processes of self-categorization, where one recognizes one's similarities with others in the organization or to the organization itself. The greater is the perceived similarity in values, goals, and characteristics, the greater the identification. It is through the perception of oneness with the focal entity and the degree to which one defines oneself by the same attributes that one develops identification with the focal entity (Dutton, Dukerich, & Harquail, 1994). Identification reflects the degree of congruence between one's own self-image and the image of the focal object and is a cognitive process.

By analogy to the relationship between a person and a group or organization, we propose two distinct dimensions of social identity, affective commitment and cognitive identification, to explain how self-production processes change consumers' relationships with products. First, we adopt the term "affective commitment" as the emotional response of consumers to their self-made product. It represents the emotional bond between a person and product and the warm feelings that one has for the object. In a similar vein, Norton et al. (2012) also talk about an emotional reaction to self-made products and propose that labor (physically building a product) leads to "love", an emotional reaction that was measured by a single item, "liking", in their study. Our conceptualization of affective commitment, based mainly on social psychology and organization behavior research, differs from that of brand attachment (cognitive as well as emotional bonds formed over intense and long-term interactions with the brand over the course of the product's life) or the extended-self (how much the product contributes to the definition and maintenance of self-identity). We focus on emotional reactions to the product occurring as a function of

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self-production that happens in a relatively short time during and immediately after participating in its construction or formulation. It entails affect-laden responses of consumers to self-made products in the moments of personal engagement during self-production rather than how much the product contributes to the self-identity, which typically unfolds over a long period of time and involves considerable cognitive self-reflection.

Second, we use the term "identification" to refer to consumers' cognitive perception of how similar one is to the focal object (perception of oneness with the target). It is the perceived overlap between the product's identity and a person's identity, how much the image of the product applies to the self. Previous research indicates that innate objects, such as products (Belk, 1988) and brands (Aaker, 1997), may be compared to living beings and personified to take on human traits (e.g., "cool" cars, "friendly" computers; cf., Yoon, Gutchess, Feinberg, & Polk, 2006). Identification, thus, entails the awareness that a product has similar properties to one's sense of self, wherein the product takes on attributes of the self, and the self takes on attributes of the product, making it a type of cognition and entailing a kind of psychological or social construction.

In short, we propose that although often empirically associated, affective commitment and identification are conceptually distinct and have different antecedents and consequences. Together, they constitute consumers' experienced self-identity with respect to self-made products. Designing and physically making the product are parts of the act of self-production. Our research explores how different stages of self-production distinctively shape the relationship between consumers and their self-made products.

2.2. Participation in the realization (physical production) stage

During the realization stage, consumers put physical effort into making, assembling, or modifying a product. The process involves varying levels of physical exertion from simple manual labor, such as cutting, hammering, or knitting, to more effortful physical tasks, such as carrying heavy parts, carving hard surfaces, or extensive painting. Kinesthetic movements and physical effort are the predominant forms of engagement during this stage.

The process also entails touching and physical handling of the product in a purposive manner before product use. Human beings start to respond to touch even before they are born (Krishna, 2012). Research on interpersonal touch shows that touch enhances one's general positive feelings toward the target (Fisher, Rytting, & Heslin, 1976; Patterson, Powell, & Lenihan, 1986), increases the attachment level in a relationship, and causes one to feel closer to the other person (Anisfeld, Casper, Nozyce, & Cunningham, 1990; Bell, Daly, & Gonzalez, 1987). While interpersonal touch generates affective responses, particularly feelings of closeness and attachment to human beings, research on the endowment effect and the "IKEA effect" reveal that touch generates psychological responses to even inanimate objects. Wolf, Arkes, and Muhanna (2008) find that touching objects increases people's willingness to pay for those objects. Research by Peck and Shu (2009) shows that merely touching an object results in an increase in perceived ownership of that object. Moreover, Norton et al. (2012) suggest that physical labor leads to love for the object. Overall, these results imply that the physical handling of a product during its construction process may result in an affective response to the product. Therefore, we suggest that physically handling the product during the realization stage creates an emotional bond to the product that, in turn, enhances evaluation of the final product:

H1. Participating in the production of a product during the realization stage enhances evaluation of the final product.

H2. Affective commitment to the product mediates the impact of consumer participation during the realization stage on product evaluation.

Physical engagement during the realization stage often provides little opportunity to modify the product according to one's wishes, tastes, or preferences, and to forge a tangible congruency between one's own and the product's identity. Therefore it is less likely to lead to identification. We suggest that to the extent that the production process involves minimal opportunity to modify the actual product, the realization process will contribute little to the consumer's self-identity in this early stage of one's relationship to the product before one has a chance to solidify the idea of a shared identity of self and product. In this case, production fails to signal the identity of the individual, and therefore, identification with the product is likely to be low or negligible. Greater evidence of a tangible nature is needed to solidify and create a strong sense of shared identity, such as what occurs through ongoing product use over time.

2.3. Participation in the design (input specification) stage

During the design stage, consumers design, make choices (such as color, materials, shape), or use their creativity to modify the shape or other aspects of a product. A growing body of experimental evidence indicates that being the designer of a product results in economic value for consumers, whereby the additional value does not merely accrue from functional value, i.e., better fit between the consumer's underlying preferences and product attributes (Franke et al., 2010; Moreau & Herd, 2010). There are psychological reactions to participating in the design stage, such as the "I designed it myself" effect that originates from awareness of being the creator of the design (Franke et al., 2010). In addition to the array of typically utilitarian or tangible values (e.g., customization of product attributes) that consumers derive from self-production, we propose a symbolic source of value that heretofore has not been elucidated.

Participating in the design process enables investment of mental energy and a sense of one's being (ideas, values, choices) into the product. As a consumer changes the visual appearance of a product, the product starts to reflect his or her tastes, preferences, and identity. The consumer is connected to a sense of the self (free will), body parts, personal attributes, possessions, and even one's own abstract ideas, in addition to other people and objects in close proximity to the self (McClelland, 1951; Prelinger, 1959). A self-made product is a vehicle for imbedding these aspects of the self into it. As the product becomes formed into the image of its creator, it gains symbolic meaning (Belk, 1988). Hence, we propose that to the extent that consumers can construct and change the visual representation of a product during the design stage, they start to identify with the product. Formally, we propose:

H3. Participating in the design stage of the self-production process enhances identification with the product.

To understand the relationship between the identification and affective commitment dimensions of person–object relationships, we draw on insights from the extended-self literature and organization research. Ahuvia (2005) and Kleine et al. (1995) reveal that products linked to an identity (from past, present, or possible futures) tend to be loved by their owners. In addition, Belk (1988) and Pierce et al. (2003) propose that people form feelings of attachment to products that express their self-identity. Identification with the product, a largely cognitive process, sets the stage for this. Self-image reflected in a product and the degree of self-reflection therein determines the emotional response to the product. In addition to the person-object literature, quantitative research from organizational theory (Bergami & Bagozzi, 2000; Bhattacharya & Sen, 2003) suggests that identification (the extent to which the individual sees the focal object as part of one's self-identity) leads to affective commitment (emotional response to the object). We, therefore, expect identification to indirectly affect product evaluation through affective

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commitment, whereas affective commitment directly affects product evaluation:

H4. Identification affects product evaluation through affective commitment.

We propose that identification with and affective commitment to the product represent the overall bond between the consumer and product. Peck and Shu (2009) show that stronger bonds are likely to result in higher valuation of products. We hypothesize that participating in the production process during the design stage strengthens identification with and affective commitment to the product, which in turn enhances evaluation of the product.

H5. Identification with, and affective commitment to, the product mediate the effect of consumer participation during the design stage on product evaluation.

3. Study 1: participation in the realization stage

In Study 1, we test whether higher levels of engagement in production during the realization stage (where no participation in design has occurred) lead to higher evaluation of the product due to increased affective commitment to, but not identification with, the product.

3.1. Method

3.1.1. Design and procedure

The study was a one-factor between-subjects design with two experimental treatment groups and one control group. The task involved making a picture frame from cardboard. Seventy-five undergraduate students, recruited from a paid subject pool in a large Midwestern university, were randomly assigned to control, low-realization, and high-realization groups. In the control condition, participants were given a cardboard picture frame and asked to examine it. They spent about 29 s on average ($SD = 2.21$) to examine the frame. In the low-realization condition, participants only had to glue together pre-cut, ready-to-assemble pieces by following step-by-step instructions. They spent about 9.42 min on average ($SD = .38$) assembling the pieces. In the high-realization condition, participants were given step-by-step instructions to make the frame from scratch. They spent 23.68 min on average ($SD = 2.07$). Detailed step-by-step instructions allowed for no specification of inputs (i.e., no opportunities for designing the product) in either the low- or high-realization conditions.

Previous literature on the endowment effect (Strahilevitz & Loewenstein, 1998) indicates that time spent with a product may increase attractiveness and valuation of the product. Hence, in order to equate the time spent with the frame across all conditions, before evaluating the frame, participants worked on a filler task in the control and the low-realization conditions for 25 and 20 min, respectively, while having the product in front of them during the whole time, allowing the respondents to see and touch it if desired. The filler task was unrelated to the product and consisted of a "count the articles" procedure. The filler task was introduced as an irrelevant study that was about identifying how definite and indefinite articles interfere with reading. The participants read short, historical stories about various cities in the United States and counted and entered the number of definite (e.g., the) and indefinite (e.g., a, an) articles in each paragraph. This task was chosen because it was easy to perform yet required concentration to complete.

3.1.2. Measures

After making the frame, participants in the experimental conditions rated the amount of physical engagement needed to make the frame (1 = none, 7 = a great deal). Then, all participants evaluated the frame using three 7-point bipolar evaluative items (negative/positive, bad/good, unfavorable/favorable; $\alpha = .92$) and reported on four 7-point scales (1 = not at all, 7 = extremely) how much they identified with the product: "The frame represents who I am," "I identify with the frame," and "It reflects the type of person that I am", adapted from Reed, Aquino, and Levy (2007), while the last item was "The image of the frame fits my self-image" ($\alpha = .90$). Participants also indicated their degree of affective commitment to the product on four 7-point scales (1 = not at all, 7 = extremely): the specific items were "like", adapted from Norton et al. (2012); "attached" and "connected", adapted from Thomson, MacInnis, and Park (2005); and "warm" ($\alpha = .87$). Identification and affective commitment measures were counterbalanced.

3.2. Results

3.2.1. Manipulation check

Participants in the high condition ($M = 3.78$, $SD = 1.48$) indicated higher levels of physical engagement needed to make the frame than did those in the low condition ($M = 2.46$, $SD = .74$), $t(53) = 4.19$, $p < .001$. The confidence intervals for high ($CI_{.95} = 3.22, 4.34$) and low ($CI_{.95} = 2.18, 2.74$) conditions did not include 1 ("none"), indicating that the physical engagement in both conditions was higher than none (the control condition). The manipulation was, therefore, successful.

3.2.2. Discriminant validity for affective commitment and identification measures

Confirmatory Factor Analysis (CFA) and Structural Equation Models (SEM) revealed that the three constructs (product evaluation, identification, and affective commitment) are distinct factors. For identification and affective commitment latent variables, the four items of each were combined to produce two indicators each, using the partial disaggregation model (Bagozzi & Heatherton, 1994). The first indicator was the average of two (out of four) items, and the remaining two measures were averaged to form the second indicator. This approach yields models with fewer parameters to estimate and reasonable ratios of cases to parameters while smoothing out measurement error to a certain extent. Fig. 1a reports the results of the SEM analyses including the standardized path coefficients. Overall, the goodness-of-fit measures ($\chi^2(11) = 12.86$, $p \approx .30$, SRMR = .030, NNFI = .99, CFI = 1.00, RMSEA = .04) show an excellent fit. An analysis of the ϕ_{ij} entries (correlations between constructs, corrected for attenuation) indicated that the correlation between product evaluation and affective commitment was .66 ($SE = .09$; $CI_{.95} = .48, .84$), product evaluation and identification was .40 ($SE = .10$; $CI_{.95} = .20, .60$), and identification and affective commitment was .59 ($SE = .10$; $CI_{.95} = .39, .79$). None of the confidence intervals included the value of one, providing evidence of discriminant validity for measures of product evaluation, identification, and affective commitment.

3.2.3. Test of hypotheses

An ANOVA on product evaluation indicated a significant main effect of participation during the realization stage ($F(2, 72) = 12.21$, $p < .001$), thereby providing support for H1. Planned contrasts revealed that, participants in the high ($M = 5.56$; $t(72) = 4.24$, $p < .001$) as well as low ($M = 5.65$; $t(72) = 4.52$, $p < .001$) conditions evaluated the product more favorably than those in the control condition ($M = 4.02$); no difference was found between high and low conditions ($t(72) = .26$, $p = .79$). Even low levels of engagement during the realization stage enhanced product evaluation.

An ANOVA on affective commitment revealed a significant main effect of participation during the realization stage ($F(2, 72) = 9.98$, $p < .001$). Participants in the high ($M = 4.01$) condition indicated higher affective commitment to the product than the ones in the low ($M = 3.12$; $t(72) = 2.48$, $p < .05$) or control ($M = 2.27$; $t(72) = 4.44$, $p < .001$) conditions; the difference between low and control conditions was also statistically significant ($t(72) = 2.19$, $p < .05$).

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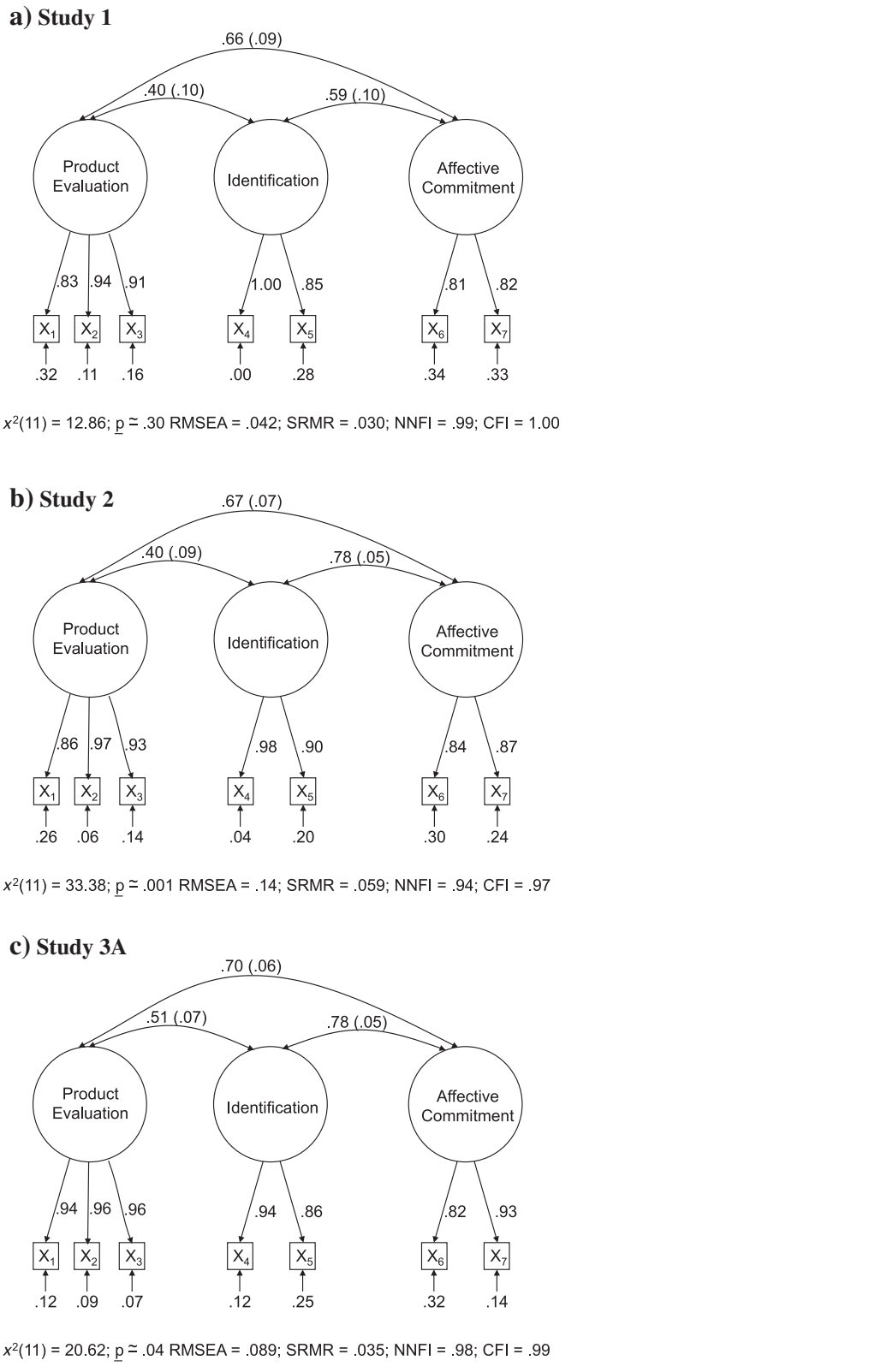

Fig. 1. Structural equation modeling results.

Next, to test whether affective commitment mediates the positive impact of participation during the realization stage on product evaluation (H2), mediation analysis followed the bootstrapping method for multi-categorical causal agents (Hayes & Preacher, 2013; Preacher & Hayes, 2008). Using dummy coding with the control group as the reference, two separate models were run: one for low-realization level and one for high-realization level. For both models, the bootstrapping confidence intervals based on 5000 samples yielded 95% confidence intervals for the relative indirect effects that exclude zero (low-realization: indirect effect = .39, SE = .18, $CI_{.95}$ = {.05, .76}; high-realization: indirect effect = .80, SE = .23, $CI_{.95}$ = {.38, 1.29}), indicating that both low- and high-realization conditions indirectly influence product evaluation

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through affective commitment; we thus obtain support for H2. As expected, an ANOVA on identification revealed no effect of participation during the realization stage ($M_{high} = 2.71$, $M_{low} = 2.14$, $M_{control} = 2.11$; $F(2, 72) = 2.09$, $p = .13$).

3.3. Discussion

Findings from Study 1 provide empirical evidence that participation during the realization stage (a) affects how consumers relate to self-made products, and b) changes their product evaluations. CFA and SEM analyses indicate that identification and affective commitment are two distinct dimensions of person–object relationships. An emotional bond (affective commitment) to the product is formed as a result of physical investment of self into the product during the realization stage. This emotional bond mediates the impact of participation during the realization stage on product evaluation. However, participation in the realization stage alone does not necessarily result in identification with the product because little opportunity is provided to design the product in concert with one's self-image. Study 2 focuses on identification processes during participation in the design stage.

4. Study 2: participation in the design stage

We investigate how participation during the design stage alone shapes person–object relationships and whether it has different effects than the realization stage in shaping how consumers relate to self-made products. Study 2 tests Hypotheses 3–5.

4.1. Method

4.1.1. Design and procedure

Similar to Study 1, Study 2 is a one-factor between subjects design with two experimental treatment groups and one control group. The study involved designing an insert for a travel coffee mug. One hundred and three undergraduate students at a large Midwestern university completed the study in partial fulfillment of course requirements. Participants were told that they would participate in several unrelated studies. The first task, presented as an investigation of PowerPoint (PPT) in terms of ease of use, was designed to control the PPT skills of participants when creating a design. It involved a basic tutorial on how to insert and modify figures, text, and ClipArt in PPT. After the tutorial, participants reported how difficult it was to edit figures, to edit text, and to do the tutorial examples (1 = very easy, 7 = very difficult; $\alpha = .77$) in PPT.

Participants were then randomly assigned to control, low-design, and high-design conditions. All participants were given a travel mug with a removable blank insert and told that they would have the option to keep the mug at the end. The base of the mug could be twisted off to remove the inner insert, and one could draw or write on the insert before reinserting and twisting on the base. In the control condition, the participants were encouraged to examine the mug but could not modify or change it in any way. They spent about 2.5 min reading the directions and examining the mug. In the low- and high-design conditions, the participants designed the insert using PPT. In the low-design condition, the participants could insert only one figure/image from PPT ClipArt, change its size, and place it anywhere they wanted. They spent an average of 5.3 min on this task. In the high-design condition, they could design the insert in any way they wanted (e.g., insert figures or images from ClipArt, change colors, write on the insert) and were encouraged to be creative. The participants spent about 11 min designing the mug. In the experimental conditions, after the design stage, the insert was printed and placed back in the travel mug by the experimenter in another room, and the mug was returned back to the participant in less than a minute.

In order to equate the time spent with the product, the participants in the control and the low-design conditions worked on a filler task for 12 and 7 min, respectively, before evaluating the mug. The filler task involved a "word generation" procedure in which participants were asked to generate words starting with the letters N, D, C and words with letters E or S in the middle (Liu, 2008).

4.1.2. Measures

Participants in the experimental conditions answered the manipulation check questions regarding the amount of effort exerted on design. They indicated the degree of original thinking and creativity that went into the design and how intellectually stimulating they found the task (1 = none at all, 7 = very much; $\alpha = .89$). They then completed the dependent measures identical to those used in Study 1: product evaluation ($\alpha = .94$), identification with ($\alpha = .94$), and affective commitment to ($\alpha = .88$) the product.

4.2. Results

Reported PPT difficulty levels did not differ across the three conditions ($F < 1$). Therefore, difficulty is excluded from subsequent analyses.

4.2.1. Manipulation check

Participants in the high-design condition ($M = 4.24$, $SD = 1.54$) reported higher levels of effort that went into the design than did those in the low-design condition ($M = 2.74$, $SD = .94$), $t(64) = -4.77$, $p < .001$. The confidence intervals for high ($CI_{.95} = 3.68, 4.79$) and low ($CI_{.95} = 2.42, 3.07$) conditions did not include 1 (none), indicating that the level of effort that went into the design in both conditions was higher than none (the control condition). The manipulation was thus successful.

4.2.2. Discriminant validity for affective commitment and identification measures

As in Study 1, CFA and SEM revealed that product evaluation, identification, and affective commitment are distinct constructs. Fig. 1b reports the results of the SEM analyses including the standardized path coefficients. The model yields a good representation of the data ($\chi^2(11) = 33.38$, $p < .001$). Three out of four goodness-of-fit measures (SRMR = .059, NNFI = .94, CFI = .97, RMSEA = .14) give a satisfactory fit, which points to an acceptable model (Hu & Bentler, 1998). An analysis of the ϕ_{ij} entries indicated that the correlation between product evaluation and affective commitment was .67 ($SE = .07$; $CI_{.95} = .53, .81$), between product evaluation and identification was .40 ($SE = .09$; $CI_{.95} = .22, .58$), and between identification and affective commitment was .78 ($SE = .05$; $CI_{.95} = .68, .88$). None of the CIs included the value of one, providing evidence of discriminant validity.

4.2.3. Test of hypotheses

An ANOVA on product evaluation showed that the effect of level of participation during the design stage was significant ($F(2, 100) = 5.22$, $p < .01$). Evaluation of the product was higher in the high-design ($M = 5.85$) than in the control condition ($M = 4.95$; $t(100) = 3.19$, $p < .01$). There was no difference between low-design ($M = 5.47$) and high-design conditions ($t(100) = 1.31$, $p = .19$). The difference between the control and the low-design conditions was marginally significant ($t(100) = 1.90$, $p = .06$). Thus, higher levels of participation during the design stage enhanced evaluation of the mug.

As expected, an ANOVA on identification revealed a significant effect of level of participation during the design stage ($F(2, 100) = 29.87$, $p < .001$); H3 was supported. Identification was lower in the control ($M = 2.28$) than in the low- ($M = 3.65$; $t(100) = 4.14$, $p < .001$) or high-design ($M = 4.89$; $t(100) = 7.70$, $p < .001$) conditions. The difference between the high- and low-design conditions was also statistically significant ($t(100) = 3.56$, $p < .01$).

An ANOVA on affective commitment revealed a significant main effect ($F(2, 100) = 23.02$, $p < .001$). Contrasts indicated that affective commitment was significantly lower in the control ($M = 3.13$) than

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in the low- ($M = 4.54$; $t(100) = 4.90$, $p < .001$) or high-design ($M = 5.03$; $t(100) = 6.43$, $p < .001$) conditions. Although directionally consistent with what was expected, there was no difference between the high- and low-design conditions ($t(100) = 1.61$, $p = .11$). Unlike participation in the realization stage (Study 1), participation in the design stage is found to enhance both identification with, and affective commitment to, the product.

To examine whether one mediator (identification) causally affects the other mediator (affective commitment), the multiple-step, multiple mediator model (Hayes, Preacher, & Myers, 2011) was used. Consistent with H5, we found that level of participation in the design stage enhances identification, and identification influences affective commitment, which in turn augments evaluation of the product; see Fig. 2b. The independent variable (level of participation during design stage — a categorical variable with three levels) was dummy coded for the analysis. We ran two models, using one of the dummy codings as the independent variable and the second one as the covariate in each model; see Table 1a for estimates of the path coefficients and the bootstrapping results. The indirect path from level of participation to product evaluation through identification and affective commitment, in that order, was significant whether there was low-design (indirect effect = .36, $SE = .15$, $CI_{.95} = \{.14, .73\}$) or high-design (indirect effect = .69, $SE = .24$, $CI_{.95} = \{.34, 1.30\}$) participation; H5 is supported. As predicted by H4, the indirect path from level of participation to product evaluation through identification (independent of affective commitment) was not significant when level of participation was low (indirect effect = −.11, $SE = .12$, $CI_{.95} = \{-.35, .10\}$) or high (indirect effect = −.20, $SE = .21$, $CI_{.95} = \{-.69, .15\}$). The indirect path from level of participation to product evaluation through affective commitment (independent of identification) was significant when level of participation was low (indirect effect = .39, $SE = .16$, $CI_{.95} = \{.12, .75\}$) but not when level of participation was high (indirect effect = .33, $SE = .20$, $CI_{.95} = \{-.03, .76\}$). Two other models were run to test the following causal chain: design participation → affective commitment → identification → product

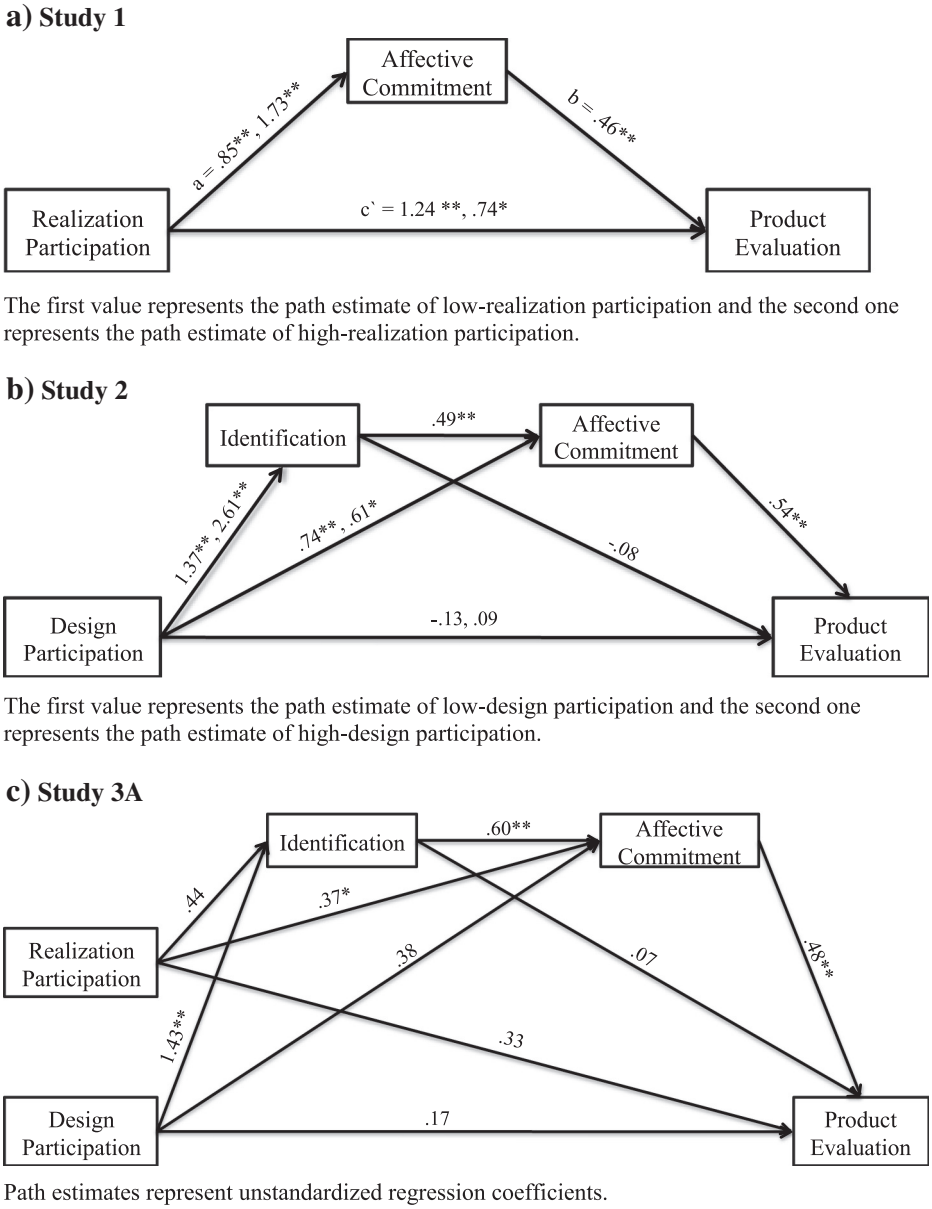

Fig. 2. Mediation models. a. Study 1: The first value represents the path estimate of low-realization participation and the second one represents the path estimate of high-realization participation. b. Study 2: The first value represents the path estimate of low-design participation and the second one represents the path estimate of high-design participation. c. Study 3A: Path estimates represent unstandardized regression coefficients. *$p < .05$, **$p < .01$.

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Table 1
Path coefficients and indirect effects for the model.

a. Study 2	Path coefficients		
	To product evaluation	To identification	To affective commitment
From low-design participation	−.13 (.27)	1.37** (.33)	.74** (.33)
From high-design participation	.09 (.31)	2.61** (.34)	.61* (.31)
From identification	−.08 (.09)		.49** (.07)
From affective commitment	.54** (.10)		

	Indirect effects	
	Estimate	Bootstrap 95% CI
Independent variable: Low-design participation		
Total	.65	.32, 1.10
Specific: Low-design → I → PE	−.11	−.35, .10
Specific: Low-design → A → PE	.39	.12, .75
Specific: Low-design → I → A → PE	.36	.14, .73
Independent variable: High-design participation		
Total	.82	.36, 1.30
Specific: High-design → I → PE	−.20	−.69, .15
Specific: High-design → A → PE	.33	−.03, .76
Specific: High-design → I → A → PE	.69	.34, 1.30

b. Study 3A	Path coefficients		
	To product evaluation	To identification	To affective commitment
From realization participation	.33 (.20)	.44 (.23)	.37* (.18)
From design participation	.17 (.23)	1.43** (.23)	.38 (.21)
From identification	.07 (.10)		.60** (.07)
From affective commitment	.48** (.10)		

	Indirect effects	
	Estimate	Bootstrap 95% CI
Independent variable: Realization participation		
Total	.33	.11, .60
Specific: Realization → I → PE	.03	−.06, .16
Specific: Realization → A → PE	.18	.01, .37
Specific: Realization → I → A → PE	.13	−.01, .32
Independent variable: Design participation		
Total	.70	.38, 1.08
Specific: Design → I → PE	.10	−.22, .42
Specific: Design → A → PE	.18	−.01, .42
Specific: Design → I → A → PE	.41	.17, .75

Presented are estimates of the path coefficients and the bootstrapping results, parentheses contain the standard errors.
I = Identification, A = Affective Commitment, PE = Product Evaluation.
* $p \leq .05$.
** $p \leq .01$.

evaluation. In these models, the indirect paths from level of design participation to product evaluation through affective commitment and identification were not significant whether participation involved low-design (indirect effect = .07, SE = .08, $CI_{.95}$ = {−.26, .05}) or high-design (indirect effect = .10, SE = .11, $CI_{.95}$ = {−.36, .07}). Thus, this outcome strengthens the findings for the hypothesized ordering from identification to affective commitment.

Next, we tested whether self-expressiveness of the product affects identification. Identification with the product should increase to the extent that the product reflects one's sense of self. Two independent raters coded the mug insert designs made by participants in the experimental conditions. The mug designs included such items as the slogans of the university that the participants attended to, their own names, sports team symbols, and pictures of drink or food items. Participants had also used various colors such as red, green, and pink to design the mugs. The raters used three seven-point scales (1 = not at all, 7 = very much) to evaluate how self-expressive the designs were ("the design is self expressive", α = .69; "one can get a sense of the designer's personality from this", α = .72; "it reflects the designer's self-image", α = .74). The ratings were averaged to form a single self-expressiveness index. Identification and affective commitment were separately regressed onto the index. As expected, self-expressiveness of the design predicted the level of identification (β = .62, t = 2.88, p < .01), indicating that identification with the product increases as the self-expressiveness of the product increases. Self-expressiveness did not have any direct effects on affective commitment (β = .10, t = .59, p = .55).

4.3. Discussion

Findings from Study 2 provide further evidence that there are two dimensions through which a person relates to a self-made product: identification and affective commitment. As expected, level of participation during the design process positively influences product evaluation, and the impact of participation on product evaluation is mediated through identification and affective commitment, while the impact of identification is mediated through affective commitment. Participation during the design stage enables consumers to modify the product to reflect who they are, their self-identity, their tastes and preferences, resulting in enhanced identification with the product. Identification increases affective commitment, which in turn enhances product evaluation.

5. Studies 3A and 3B: participation in both the design and realization stages

It is possible that the divergent results for identification between Studies 1 and 2 are due to the products used in the studies. Consumers might be more likely to identify with a mug, a product used dynamically and frequently, than they would with a picture frame, a product passively displayed and viewed infrequently. We, therefore, sought to replicate our results in the next two studies with the same product for both stages of the production process.

Moreover, from a managerial standpoint, the question remains as to whether it is beneficial for a firm to invest in enabling its consumers to engage in both stages of production. In the present study, we thus test the interactive effects of participation in the design and realization stages. On the one hand, two stages could interact with each other to further enhance (additively or multiplicatively) product evaluation and strengthen the person–object relationship. On the other hand, a high level of participation in only one stage could be sufficient to enhance product evaluation to some maximum level, and any other effects resulting from participation in an additional stage could be minimal. Studies 3A and 3B aim to address these questions.

5.1. Study 3A: method

5.1.1. Design and procedure

Study 3A was a 2 (level of participation during design stage: low vs. high) × 2 (level of participation during realization stage: low vs. high) between-subjects design. The task involved designing and making a music CD with its case. One hundred and twenty-two undergraduate students were recruited from a paid subject pool at a large Midwestern university. First, participants were administered the same PPT tutorial from Study 2, which measured their skills in PPT (α = .73). After completing filler studies, the participants were told that the next study would investigate music preferences of students. They were asked to choose five songs from a list containing six genres with six songs under each genre that were the most popular among students according to a pretest. The instructions indicated that the chosen songs would be burned onto a CD and the CD placed in a case. Participants were told that they would have the option to keep the CD and its case. After choosing the songs, they were randomly assigned to low- or high-realization and low- or high-design conditions.

In the low-realization conditions, the songs were burned onto a CD, and its case was made for the participant by the experimenter in another room. In the high-realization conditions, a blank CD case template on PPT was provided to the participants. They made the CD case following step-by-step guidelines; first they had to type the titles of the songs and the artists, then print the template on white cardboard, and finally cut and glue the template. Following the guidelines, the participants also burned the songs onto a CD themselves. In the low-design conditions, the participants could not modify the case template except for typing up the song titles and the artists. In the high-design conditions, they could title the CD and design the case in any way they wanted using PPT.

The low-realization/low-design condition, comprising only choosing the songs, served as the control condition representing the baseline evaluation of the CD and its case. The participants spent 3.5 min on average choosing the songs. In the low-realization/high-design condition, participants spent 16.4 min on average choosing the songs and designing the case. In the high-realization/low design condition, they spent 16.6 min on average choosing the songs, burning the CD, and making the case. In the high-realization/high design condition, they spent 27 min on average choosing the songs, burning the CD, and designing and making the case. In the low-realization conditions, the final product was returned to the participant in less than three minutes. To equate the time spent with the product, participants worked on the same filler task as in Study 2 while the CD and its case were in front of them. They did so for 20, 15, and 10 min in the low-realization/low-design, low-realization/high design, and high-realization/low-design conditions, respectively.

5.1.2. Measures

All participants, except for those in the low-realization/low-design condition, indicated the level of effort (1 = none at all, 7 = very much) that went into the physical construction ("how much basic physical effort did you use", "how much simple manual labor did you use", "how much basic physical energy did you put into making the product"; α = .78) as well as the design ("how much original thinking went into making the CD and its case", "how much creativity did you use", "how much did you think to make it"; α = .91). Then, all participants answered the product evaluation (α = .97), identification (α = .91), and affective commitment (α = .88) questions.

5.2. Study 3A: results

PPT difficulty was significantly different between low (M = 1.16) and high (M = 1.32) design conditions ($F(1, 117)$ = 4.65, p < .05). Analyses conducted with and without PPT difficulty yielded the same substantive results. We thus report only the findings without PPT difficulty.

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5.2.1. Manipulation checks

An ANOVA on reported design effort indicated a significant main effect of design participation ($F(1, 90) = 59.71$, $p < .001$), and a non-significant effect of realization participation ($F < 1$) levels; the design manipulation was thus successful. An ANOVA on reported physical effort indicated a significant main effect of realization participation ($F(1, 90) = 9.55$, $p < .01$), and a non-significant effect of design participation ($F(1, 90) = 1.91$, $p = .17$) levels; the realization manipulation was successful.

5.2.2. Discriminant validity for affective commitment and identification measures

As in Studies 1 and 2, CFA and SEM revealed that measures of product evaluation, identification, and affective commitment are distinct (see Fig. 1c). The model yields a good representation of the data ($\chi^2(11) = 20.62$, $p \approx .04$). Three out of four goodness-of-fit measures (SRMR = .035, NNFI = .98, CFI = .99, RMSEA = .089) give a satisfactory fit, pointing to an acceptable model. An analysis of the ϕ_{ij} entries indicated that the correlation between product evaluation and affective commitment was .70 ($SE = .06$; $CI_{.95} = .58, .82$), between product evaluation and identification was .51 ($SE = .07$; $CI_{.95} = .37, .65$), and between identification and affective commitment was .78 ($SE = .05$; $CI_{.95} = .68, .88$). None of the confidence intervals included the value of one, providing evidence of discriminant validity for the measures of the three constructs.

5.2.3. Test of hypotheses

Replicating findings from Studies 1 and 2, an ANOVA on product evaluation showed that the main effects of levels of participation during realization ($F(1, 118) = 9.01$, $p < .01$) and design ($F(1, 118) = 14.81$, $p < .001$) were significant. The main effects were qualified by a marginally significant interaction ($F(1, 118) = 2.91$, $p = .09$). We did not have an a priori hypothesis regarding the interaction; however, we explored further what happens when consumers engage in both stages of production by decomposing the interaction. Simple effects tests indicated that during low levels of design participation, evaluation of the product was significantly more favorable when realization was high ($M = 5.26$) rather than low ($M = 4.18$) ($F(1, 118) = 10.43$, $p < .01$). However, during high levels of design participation, evaluation of the product did not differ between the high ($M = 5.75$) and low ($M = 5.46$) realization conditions ($F < 1$). Similarly, when realization participation was low, higher levels of design participation enhanced evaluation of the product ($F(1, 118) = 15.02$, $p < .001$). However, when realization participation was high, design participation did not enhance evaluation of the product ($F < 1$). A high level of participation in either stage of the production process was enough to enhance evaluation of the final product. Participation in an additional stage of production did not necessarily enhance the evaluation of the product.

An ANOVA on identification revealed a significant main effect for design participation ($M_{low} = 2.63$, $M_{high} = 4.06$; $F(1, 118) = 37.81$, $p < .01$), but only a marginally significant effect for realization participation ($M_{low} = 3.13$, $M_{high} = 3.56$; $F(1, 118) = 3.40$, $p = .07$). The interaction effect was not significant ($F < 1$). As hypothesized, design participation enhanced identification with the product; however, realization participation exhibited a minimal effect on identification.

As anticipated, an ANOVA on affective commitment revealed significant main effects for both realization ($F(1, 118) = 8.04$, $p < .01$) and design ($F(1, 118) = 30.21$, $p < .001$) participation. The interaction was not significant ($F < 1$). Participants reported higher affective commitment in the high ($M = 4.21$) than low ($M = 3.56$) realization condition, and in the high ($M = 4.51$) than low ($M = 3.26$) design condition.

To test the proposed mediations, bootstrapping analyses were conducted to estimate direct and indirect effects with two independent variables and two mediators; see Fig. 2c. Product evaluation was the dependent variable; realization and design participation were the independent variables. Identification and affective commitment were hypothesized mediators for the effects of design and realization participation. Two separate models were run using bootstrapping. In each of the models, design or realization participation was specified as the independent variable and the other was treated as a covariate. Covariates are treated exactly like independent variables in the estimation, with paths to all mediators and the outcome. Including the other independent variable as a covariate in the model corrects for the effect of the independent variable, and each model generates the desired indirect effect for the variable currently listed as the independent variable.

First, realization participation was the independent variable and design participation was the covariate. The results indicated that the total (indirect + direct) effect of realization participation on product evaluation (total effect = .66, $p < .01$) was nonsignificant when the mediators were included in the model (direct effect of realization participation = .33, $p = .11$). The total indirect effect of realization participation on product evaluation was significant, with a point estimate of .33 and a 95% CI of .11 to .60. Only the indirect effect through affective commitment (indirect effect = .18, $SE = .09$, $CI_{.95} = \{.01, .37\}$) was significant. The indirect paths through identification (indirect effect = .03, $SE = .05$, $CI_{.95} = \{-.06, .16\}$), and through identification and affective commitment (indirect effect = .13, $SE = .08$, $CI_{.95} = \{-.01, .32\}$) were not significant, because their confidence intervals contained zero. The impact of realization participation on product evaluation was mediated only through affective commitment. Furthermore, consistent with predictions, the path estimates from realization participation to affective commitment (path estimate = .37, $SE = .18$, $p < .05$) and from affective commitment to product evaluation (path estimate = .48, $SE = .10$, $p < .01$) were significant, whereas those from realization participation to identification (path estimate = .44, $SE = .23$, $p = .06$) were not.

In the second model, design participation was the independent variable and realization participation was the covariate. The results indicate that the total effect of realization participation on product evaluation (total effect = .87, $p < .01$) was non-significant when the mediators are included in the model (direct effect of design participation = .17, $p = .46$). The total indirect effect of design participation on product evaluation was significant, with a point estimate of .70 and a 95% CI of .38 to 1.08. The indirect effects through identification (indirect effect = .10, $SE = .16$, $CI_{.95} = \{-.22, .42\}$), and through affective commitment (indirect effect = .18, $SE = .11$, $CI_{.95} = \{-.01, .42\}$) were not significant. The indirect path to product evaluation through both identification and affective commitment, in that order, was however significant (indirect effect = .41, $SE = .15$, $CI_{.95} = \{.17, .75\}$). Consistent with predictions, the effects from design participation to identification (path estimate = 1.43, $SE = .23$, $p < .001$), from identification to affective commitment (path estimate = .60, $SE = .07$, $p < .001$), and from affective commitment to product evaluation (path estimate = .48, $SE = .10$, $p < .001$) were significant. See Table 1b for the estimates and bootstrapping results. Another model where design participation was again the independent variable and realization participation was the covariate tested the following causal chain: design participation → affective commitment → identification → product evaluation. In this model, the indirect path to product evaluation through affective commitment and identification was not significant (indirect effect = .06, $SE = .09$, $CI_{.95} = \{-.10, .24\}$). This result demonstrates that affective commitment does not influence identification and thereby bolsters the reported findings for the hypothesized sequence.

In sum, the analyses indicate that the effect of realization participation on product evaluation is mediated through affective commitment only, whereas the impact of design participation on product evaluation is mediated through both identification and affective commitment. Furthermore, identification precedes affective commitment in the case of design participation.

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Next, we investigated whether self-expressiveness of the design affects identification with the product. Two independent raters coded the CD case designs made by the participants in the high-design participation conditions. The CD cases from the low-design conditions only listed the songs, without any particular design, and therefore were not rated. The raters used the same scales from Study 2 to evaluate how self-expressive the designs were (the design is self expressive, $\alpha = .93$; one can get a sense of the designer's personality from this, $\alpha = .88$; it reflects the designer's self-image, $\alpha = .64$). The ratings were averaged to form a self-expressiveness index. Identification and affective commitment were regressed onto the index separately. As expected, self-expressiveness of the design predicted the level of identification ($\beta = .51$, $t = 6.76$, $p < .001$). It also affected the level of affective commitment ($\beta = .41$, $t = 5.25$, $p < .001$).

5.3. Study 3B: method

The above studies presented the manipulation check questions before the main dependent variable questions. Thus we cannot rule-out the possibility that the manipulation checks might have influenced participants' responses to product evaluation, as well as identification and affective commitment measures, by priming them to the physical and/or design effort that they have invested into the product. Thus, Study 3A was rerun (n = 144) using the process of designing and physically making a picture frame (instead of a CD with its case), with the measures of manipulation check questions asked at the end. The participants were recruited at a large private university in Turkey. All measurement scales from Study 3A were translated into Turkish using a back-translation procedure (Brislin, 1976; Cavusgil & Das, 1997).

5.4. Study 3B: results

The results replicated Study 3A findings. An ANOVA on product evaluation revealed significant main effects of realization ($F(1, 140) = 9.19$, $p < .01$) and design ($F(1, 140) = 17.25$, $p < .001$) participations, as well as a significant interaction effect ($F(1, 140) = 4.14$, $p < .05$). Identical to Study 3A findings, simple effects tests indicated that during low levels of design participation, evaluation of the product was significantly more favorable when realization was high ($M = 5.34$) rather than low ($M = 4.24$) ($F(1, 140) = 10.9$, $p < .01$). However, during high levels of design participation, evaluation of the product did not differ between the high- ($M = 5.80$) and low- ($M = 5.59$) realization conditions ($F < 1$). Similarly, when realization participation was low, higher levels of design participation enhanced evaluation of the product ($F(1, 140) = 17.09$, $p < .001$). However, when realization participation was high, design participation did not enhance evaluation of the product ($F(1, 140) = 2.55$, $p = .11$).

Also identical to Study 3A, an ANOVA on identification revealed a significant main effect for design participation ($M_{low} = 2.32$, $M_{high} = 4.14$; $F(1, 140) = 53.46$, $p < .001$). However, the main effect of realization participation ($F(1, 140) = 1.28$, $p = .26$) and the interaction effect ($F < 1$) were not significant. As in Study 3A, an ANOVA on affective commitment revealed significant main effects for both realization ($F(1, 140) = 4.89$, $p < .05$) and design ($F(1, 140) = 27.56$, $p < .001$) participation. The interaction was not significant ($F(1, 140) = 1.41$, $p = .24$). Participants reported higher affective commitment in the high- ($M = 3.99$) than low- ($M = 3.46$) realization condition, and in the high- ($M = 4.42$) than low- ($M = 3.07$) design condition.[1]

The results indicate that the order of the manipulation check questions did not affect the Study 3A findings. Moreover, replication of our findings in two different countries and languages enhances the generalizability of the results.

[1] The complete analyses and results for Study 3B are available upon request.

5.5. Discussion

Studies 3A and 3B replicate findings from Studies 1 and 2, and provide convergent evidence that participation in different stages of self-production differentially affects how consumers relate to products. We find that participation during the realization stage enhances affective commitment, but not identification; whereas participation during the design stage enhances identification with the product, which in turn results in stronger affective commitment to the product. Finally, engaging in both stages of production does not create value for consumers over and above the main effects obtained for a high level of participation in either stage alone.

These results are consistent with the suggestion by Franke et al. (2010) that marginal effects of consumer participation may diminish as the level of contribution increases. It is possible that there is a saturation point beyond which higher levels of participation may be perceived as a cost rather than a value for consumers, and that moderate levels of consumer engagement provide the highest value. We speculate that there may be even an inverse-U shape relationship between the level of effort in self-production activities and valuation of the self-made products. Future research is needed to clarify this relationship.

6. General discussion

Our research focused on elucidating the psychological responses of consumers to specific stages of self-production activities. In particular, we sought to contribute to insights about self-made products by specifying two dimensions through which consumers may relate to them: identification and affective commitment. To the best of our knowledge, this is the first empirical study that investigates the dimensions through which consumers relate to self-made products. Our results indicated that affective commitment and identification are closely related, yet distinct, concepts that predict consumers' favorable evaluation of products.

We demonstrated that consumers feel a greater emotional bond (i.e., affective commitment) with the product when they physically invest themselves in the product during the realization stage. During the design stage, consumers form a cognitive bond (i.e., identification) with the product, when they are able to manipulate the product to symbolize their self-identity. Additionally, identification with the product enhances affective commitment to the finished end-product. This latter link suggests that participation in the design of products contributes to one's identification with products, a cognitive process, and identification then enhances one's affective commitment to products, an affective process. This identification-to-affective commitment sequence has been found in research on group identity and social identity within organizations (e.g., Ellemers et al., 1999). We contribute to a better understanding of affective commitment to products by showing that identification during the design stage, as well as consumers' physical construction of a product during the realization stage, can create a sense of emotional bond (affective commitment) to the product and thereby enhance evaluation of the self-made end-product. Our findings also contribute to the literatures on self-production, co-production, and do-it-yourself products by identifying psychological and social processes underlying consumer responses and the different dimensions through which consumers may relate to a self-made product at different stages of its production.

We offer insights that go beyond what has been uncovered in prior studies that have employed a variety of operationalizations of self-production. For example, Mochon, Norton, and Ariely (2012) and Norton et al. (2012) provided step-by-step directions to participants to make origami figures. Bendapudi and Leone (2003) asked participants to consider situations where they select and then physically build the product (e.g., bookshelf, poster frame). Franke et al. (2010) required participants to virtually design a t-shirt, scarf, or a cell phone cover. Buechel and Janiszewski (2014) had participants engage in physical assembly of a simple craft kit (Winter Holiday Elf) and manipulate

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the timing of the customization decision (i.e., whether design occurs before or during realization); hence they did not systematically vary the level of participation during both design and realization stages as we did in four studies.

In our research, the design and realization stages were fully separated and examined individually (Studies 1 and 2), as well as combined and examined together (Studies 3A and 3B). Buechel and Janiszewski (2014) suggest that when the design and assembly activities are segregated (vs. integrated), consumers' valuations of the input kit materials decrease. However, they report no significant effects on valuations of the finished end-product. We speculate that the null effects were due to the fact that participants used input kits that they were unlikely to perceive as being part of their self-identity. Moreover, there was no actual separation of the physical assembly and customization decisions in their study. They manipulated the timing of the customization decisions when there was already physical assembly as opposed to the engagement in only one or two different stages of self-production, as in our studies. The present research shows that, in line with previous research, even when customization (design) decisions and assembly actions (realization) are performed separately, higher levels of participation, in fact, do lead to enhanced evaluation of the finished outcome product. In addition, we provided a theoretical basis for proposing and documenting how identification and affective commitment mediate the effect of the level of design and realization participation on evaluation of self-made products.

From a managerial viewpoint, both identification and physical construction can be used to create affective commitment to products and could be the target of marketing communications and activities designed to enhance affective commitment to products. Affective commitment not only enhances evaluation of the product but also lengthens its usage duration and increases the care a consumer shows for the product and, therefore, contributes to sustainable consumption (Nieuwenhuis, 2008). From a practical perspective, the relative significance of affective commitment to, and identification with, the product may vary by context. One factor that may affect the relative significance is the type of the product that is produced or whether the product will be used privately or publicly. Publicly (vs. privately) consumed products are signals of identity to the outside world. Hence, consumers may be more likely to publicly use products that they identify with, especially if they have high needs for self-expression. Consequently, identification with the product may turn out to be more important for managers especially if their products tend to be consumed publicly. On the other hand, in some contexts, affective commitment may provide greater motivation to consumers for promoting positive word-of-mouth.

Furthermore, we highlight the importance of encouraging consumers to take part in the production process physically during the realization stage. Previous research (Moreau & Herd, 2010; Deng, Hui, & Hutchinson, 2010) focuses mostly on self-design (e.g., creativity and choice), not physical engagement. Researchers have largely neglected to study the specific role of the realization stage in the production of products. Advancements in the online environment have been providing ever-increasing opportunities for design participation at the expense of the realization stage. However, we empirically show that participation during the realization stage is distinct from participation during the design stage and can enhance product evaluations as much as design participation.

Finally, our results suggest that engaging consumers even in a limited amount of physical assembly rather than having them build from scratch, or asking them to choose a limited number of features, instead of having them design from scratch, may have similar effects in terms of enhancing evaluation of the finished end-products. Hence, from a managerial perspective, investing in relatively easy-to-implement systems that enable consumers to participate in even limited amounts of self-production activities (either in the realization or the design stage) is likely to create customer value and prove to be useful for the firms to do. For example, while marketing ready-to-assemble furniture such as an IKEA bookcase, companies may provide stickers or special pencils that allow consumers to write on the product and enable consumers to transform products to symbols of self-identity.

7. Limitations and future research

Our research presents several other interesting questions that have considerable practical implications. For example, personality variables (i.e., creativity, liking to work with one's hands) may moderate the value created through different stages of production and are domains ripe for exploration. Consumers who enjoy working with their hands and expressing themselves through physical labor may identify with self-made products even if they only participate in the realization stage, since manual labor is part of their self-identity. Our studies involved university students who may have higher needs for cognition than many non-students and may value design more than assembly or customized construction opportunities. Hence, design participation may have been relatively more important for our population and may add more value than craftsmanship or manual effort.

In our studies, in order to equate time spent with the product, we used filler tasks in the control and low-level of participation conditions. In the high-level of participation conditions, participants evaluated the finished product right after the haptic experience. Therefore, for consumers in the control and low-level of participation conditions, the gap in time between the haptic experience and the evaluation of the product could have affected these consumers. However, in all conditions, participants were not limited in their handling of the product insofar as it was always in front of them while they worked on the filler tasks. They could look at and touch the products whenever they wanted, as well as experience the visual cue of the product to remind them of actually experiencing it a few minutes earlier. We submit that using filler tasks reflects a conservative test of our hypothesized relationships, since consumers in real-world settings would presumably spend less time with the product than what we imposed in the control and low-level of participation conditions as a result of the filler task (Strahilevitz & Loewenstein, 1998). Future research is needed to clarify whether eliminating or changing the duration of filler tasks affects consumers' evaluation of self-made products.

We measured only one consequence of the mediating mechanisms (i.e., identification and affective commitment), that is product evaluation. However, by scrutinizing product evaluation, we provide results for a central variable that determines other variables. For example, in attitude theory, evaluations are important, often the most important, antecedents to decisions, intentions, and behavior. Future research may address how affective commitment and identification affect other variables such as word-of-mouth, loyalty, length of product usage, and satisfaction with the performance of the product.

The theoretical framework that we used in our research was adopted from the social identity literature that emphasizes the distinction among cognitive identification, affective commitment, and collective self-esteem (an evaluative component) derived from the target object (i.e., group). Our research explored only two dimensions (identification and affective commitment) in this relationship. Future research might investigate whether and how self-production contributes to self-esteem that is derived from the product. Products can be used to build and restore the sense of self (Belk, 1988; Gao, Wheeler, & Shiv, 2009) as the extended-self literature indicates. As our work reveals, self-made products may be symbols of identity. To the extent that they serve as constant reminders of one's sense of self, owning or using self-made products may make consumers feel good about themselves, feel smart and confident, and help them gain respect from others, especially if the products symbolize positive aspects of identity. This implies an interaction between the self and the product. First, the person changes the image of the product to reflect his or her identity (identifies with the product); later on, the product changes the person's sense of self-esteem as it reminds one of him- or herself and his or her actions. In

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fact, in the context of organizational behavior, Bergami and Bagozzi (2000) found that identification with the organization determined organization-based self-esteem. Hence, identification with, but not necessarily affective commitment to, the product is likely to affect product-based self-esteem. This too is a fruitful direction for future research.

Additionally, future research is needed to investigate other conditions under which identification and affective commitment dimensions and their functioning differ. We expect that the current versus ideal self may have unique effects. Consumers may identify with products that reflect their current identity; however, affective commitment to the product may depend on the extent to which that part of identity is perceived positively or desirable.

Finally, we found that engaging consumers in both stages of self-production did not create value over and above a high level of participation in either stage alone. In our studies, the participation level in the production process was necessarily limited due to experimental constraints. Higher levels of participation in both stages may result in additive or multiplicative effects depending on the circumstances. For instance, designing and building a home may result in a much more favorable evaluation of the final product than that resulting from building the home without participating in actual construction. Nevertheless, situations involving such extreme levels of production participation are likely to be limited, given the high cost of investing time and effort in these situations and infrequent opportunities to do so. Hence, we expect our results to hold in many everyday consumption situations.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at http://dx.doi.org/10.1016/j.ijresmar.2014.05.003. Estimation code for this article can be found online at http://www.runmycode.org. Interested scholars may contact either the corresponding author or IRJM's editorial office in order to request the dataset.

References

Aaker, J. (1997). Dimensions of brand personality. *Journal of Marketing Research*, *34*(3), 347–356.

Aaker, J., Fournier, S., & Brasel, S. A. (2004). When good brands do bad. *Journal of Consumer Research*, *31*(1), 1–16.

Ahuvia, A.C. (2005). Beyond the extended self: Loved objects and consumers' identity narratives. *Journal of Consumer Research*, *32*(June), 171–184.

Ainsworth, M.D. S., & Bowlby, J. (1991). An ethological approach to personality development. *American Psychologist*, *46*, 333–341.

Allen, N. J., & Meyer, J. P. (1990). The measurement and antecedents of affective, continuance and normative commitment to the organization. *Journal of Occupational Psychology*, *63*, 1–18.

Anisfeld, E., Casper, V., Nozyce, M., & Cunningham, N. (1990). Does infant carrying promote attachment? An experimental study of the effects of increased physical contact on the development of attachment. *Child Development*, *61*, 1617–1627.

Atakan, S. S., Bagozzi, R., & Yoon, C. (2014). Make it your own: How process valence and self-construal affect evaluation of self-made products. *Psychology & Marketing*, *31*(6), 451–468.

Bagozzi, R. P., & Heatherton, T. F. (1994). A general approach to representing multifaceted personality constructs: Application to state self-esteem. *Structural Equation Modeling*, *1*(1), 35–67.

Ball, A.D., & Tasaki, L. H. (1992). The role and measurement of attachment in consumer behavior. *Journal of Consumer Psychology*, *1*(2), 155–172.

Batra, R., Ahuvia, A., & Bagozzi, R. P. (2012). Brand love. *Journal of Marketing*, *76*, 1–16.

Belk, R. (1988). Possessions and the extended self. *Journal of Consumer Research*, *15*(2), 139–168.

Bell, R. A., Daly, J. A., & Gonzalez, M. C. (1987). Affinity-maintenance in marriage and its relationship to women's marital satisfaction. *Journal of Marriage and Family*, *49*(2), 445–454.

Bendapudi, N., & Leone, R. P. (2003). Psychological implications of customer participation in co-production. *Journal of Marketing*, *67*(Jan), 14–28.

Bergami, M., & Bagozzi, R. P. (2000). Self-categorization, affective commitment and group self-esteem as distinct aspects of social identity in the organization. *British Journal of Social Psychology*, *39*, 555–577.

Bhattacharya, C. B., & Sen, S. (2003). Consumer-company identification: A framework for understanding consumers' relationships with companies. *Journal of Marketing*, *67*(2), 76–88.

Bloch, P. H. (1995). Seeking the ideal form: Product design and consumer response. *Journal of Marketing*, *59*(3), 16–29.

Bowlby, J. (1969). *Attachment and loss: Vol. 1. Attachment*. London: Hogarth Press.

Brislin, R. W. (1976). Comparative research methodology: Cross-cultural studies. *International Journal of Psychology*, *11*(3), 215–229.

Buechel, E. C., & Janiszewski, C. (2014). A lot of work or a work of art: How the structure of a customized assembly task determines the utility derived from assembly effort. *Journal of Consumer Research*, *40*. http://dx.doi.org/10.1086/673846.

Cavusgil, S. T., & Das, A. (1997). Methodological issues in empirical cross-cultural research: A survey of the management literature and a framework. *Management International Review*, *37*, 71–96.

Csikszentmihalyi, M., & Rochberg-Halton, E. (1981). *The meaning of things: Domestic symbols and the self*. Cambridge University Press.

Deng, X., Hui, S. K., & Hutchinson, J. W. (2010). Consumer preferences for color combinations: An empirical analysis of similarity-based color relationships. *Journal of Consumer Psychology*, *20*(4), 476–484.

Dutton, J. E., Dukerich, J. M., & Harquail, C. V. (1994). Organizational images and member identification. *Administrative Science Quarterly*, *39*, 239–263.

Ellemers, N., Kortekaas, P., & Ouwerkerk, J. W. (1999). Self-categorisation, commitment to the group and group self-esteem as related but distinct aspects of social identity. *European Journal of Social Psychology*, *29*, 371–389.

Fisher, J.D., Rytting, M., & Heslin, R. (1976). Hands touching hands: Affective and evaluative effects of an interpersonal touch. *Sociometry*, *39*, 416–421.

Franke, N., Schreier, M., & Kaiser, U. (2010). The "I designed it myself" effect in mass customization. *Management Science*, *56*(1), 125–140.

Fuchs, C., Prandelli, E., & Schreier, M. (2010). The psychological effects of empowerment strategies on consumers' product demand. *Journal of Marketing*, *74*, 65–79.

Gao, L., Wheeler, S.C., & Shiv, B. (2009). The "shaken self": Product choices as a means of restoring self-view confidence. *Journal of Consumer Research*, *36*, 29–38.

Grubb, E. L., & Grathwohl, H. L. (1967). Consumer self-concept, symbolism, and market behavior: A theoretical approach. *Journal of Marketing*, *31*, 22–27.

Hayes, A. F., & Preacher, K. J. (2013). *Statistical mediation analysis with a multicategorical independent variable*. British Journal of Mathematical and Statistical Psychology. http://dx.doi.org/10.1111/bmsp.12028.

Hayes, A. F., Preacher, K. J., & Myers, T. A. (2011). Mediation and the estimation of indirect effects in political communication research. In E. P. Bucy, & R. L. Holbert (Eds.), *Sourcebook for political communication research: Methods, measures, and analytical techniques* (pp. 434–465). New York: Routledge.

Hazan, C., & Shaver, P. R. (1994). Attachment as an organizational framework for research on close relationships. *Psychological Inquiry*, *5*, 68–79.

Hu, L., & Bentler, P.M. (1998). Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological Methods*, *3*, 424–453.

Kleine, S. S., Kleine, R. E., III, & Allen, C. T. (1995). How is a possession "me" or "not me"? Characterizing types and an antecedent of material possession attachment. *Journal of Consumer Research*, *22*(Dec), 327–343.

Kleine, R. E., III, Kleine, S. S., & Kernan, J. B. (1993). Mundane consumption and the self: A social-identity perspective. *Journal of Consumer Psychology*, *2*(3), 209–235.

Krishna, A. (2012). An integrative review of sensory marketing: Engaging the senses to affect perception, judgment and behavior. *Journal of Consumer Psychology*, *22*(3), 332–351.

Lengnick-Hall, C. A. (1996). Customer contributions to quality: A different view of the customer-oriented firm. *The Academy of Management Review*, *21*(3), 791–824.

Liu, W. (2008). Focusing on desirability: The effect of decision interruption and suspension on preferences. *Journal of Consumer Research*, *35*(4), 640–652.

McClelland, D. (1951). *Personality*. New York: Holt, Rinehart, and Winston.

Mochon, D., Norton, M., & Ariely, D. (2012). Bolstering and restoring feelings of competence via the IKEA effect. *International Journal of Research in Marketing*, *29*, 363–369.

Moreau, C. P., & Herd, K. B. (2010). To each his own? How comparisons with others influence consumers' evaluations of their self-designed products. *Journal of Consumer Research*, *36*(5), 806–819.

Nieuwenhuis, P. (2008). From banger to classic — a model for sustainable car consumption? *International Journal of Consumer Studies*, *32*, 648–655.

Norton, M., Mochon, D., & Ariely, D. (2012). The IKEA effect: When labor leads to love. *Journal of Consumer Psychology*, *22*, 453–460.

Park, C. W., MacInnis, D. J., & Priester, J. (2008). Brand attachment: Constructs, consequences, and causes. *Foundations and Trends in Marketing*, *1*(3), 191–230.

Patterson, M. L., Powell, J. L., & Lenihan, M. G. (1986). Touch, compliance, and interpersonal affect. *Journal of Nonverbal Behavior*, *10*(1), 41–50.

Peck, J., & Shu, S. B. (2009). The effect of mere touch on perceived ownership. *Journal of Consumer Research*, *36*(Oct), 434–447.

Pierce, J. L., Kostova, T., & Dirks, K. T. (2003). State of psychological ownership: Integrating and extending a century of research. *Review of General Psychology*, *7*(1), 84–107.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, *40*(3), 879–891.

Prelinger, E. (1959). Extension and structure of the self. *Journal of Psychology*, *47*(1), 13–23.

Reed, A., Aquino, K., & Levy, E. (2007). Moral identity and judgments of charitable behaviors. *Journal of Marketing*, *71*, 178–193.

Strahilevitz, M.A., & Loewenstein, G. (1998). The effect of ownership history on the valuation of objects. *Journal of Consumer Research*, *25*(3), 276–289.

Please cite this article as: Atakan, S.S., et al., Consumer participation in the design and realization stages of production: How self-production shapes consumer evaluations ..., *Intern. J. of Research in Marketing* (2014), http://dx.doi.org/10.1016/j.ijresmar.2014.05.003

Tajfel, H. (1978). *Differentiation between social groups: Studies in the social psychology of intergroup relations*. London: Academic Press.

Thomson, M., MacInnis, D. J., & Park, C. W. (2005). The ties that bind: Measuring the strength of consumers' emotional attachments to brands. *Journal of Consumer Psychology*, *15*(1), 77–91.

Troye, S. V., & Supphellen, M. (2012). Consumer participation in coproduction: "I made it myself" effects on consumers' sensory perceptions and evaluations of outcome and input product. *Journal of Marketing*, *76*(2), 33–46.

Turner, J. C. (1985). Social categorization and the self-concept: A social cognitive theory of group behavior. In E. J. Lawler (Ed.), *Advances in group processes: Theory and research, Vol. 2*. (pp. 77–122). Greenwich, CT: JAI Press.

Van Raaij, W. F., & Pruyn, A. Th. H. (1998). Customer control and evaluation of service validity and reliability. *Psychology and Marketing*, *15*, 811–832.

Wolf, J. R., Arkes, H. R., & Muhanna, W. A. (2008). The power of touch: An examination of the effect of duration of physical contact on the valuation of objects. *Judgment and Decision Making*, *3*(6), 476.

Yoon, C., Gutchess, A. H., Feinberg, F., & Polk, T. A. (2006). A functional magnetic resonance imaging study of neural dissociations between brand and person judgments. *Journal of Consumer Research*, *33*(1), 31–40.

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