A Lot of Work or a Work of Art: How the Structure of a Customized Assembly Task Determines the Utility Derived from Assembly Effort

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Customized assembly occurs when a consumer makes customization decisions and participates in the construction or modification of a product. While customization increases satisfaction with the end-product, less is known about the utility derived from the assembly effort. Three studies show that the structure of the customized assembly task determines whether consumers derive negative or positive utility from the assembly effort. When customization decisions and assembly processes are segregated, consumers find the assembly process disagreeable. Consequently, more assembly effort leads to a lesser appreciation for the assembly experience. When customization decisions and assembly processes are integrated, consumers become creatively engaged in the assembly process. Consequently, more assembly effort leads to a greater appreciation for the assembly experience. In each case, the assembly experience influences the value of the materials that afforded the experience (i.e., the to-be-assembled product). The results have implications for repeat purchasing in product categories that allow for coproduction.

Consumers use a variety of methods to participate in the production of products (Etgar 2008; Lusch, Brown, and Brunswick 1992). One of the more interesting acts of coproduction is customized assembly. Consumers engage in customized assembly when they make customization decisions and participate in the construction or modification of a product (Dahl and Moreau 2007). Customized assembly is particularly interesting because it involves trading off a cost (i.e., assembly effort) against a benefit (i.e., the opportunity to customize). All things being equal, consumers should prefer to have the opportunity to customize but should want to avoid the effort of assembly (see Bendapudi and Leone 2003; Dellaert and Stremersch 2005; Etgar 2008). Yet consumers seem to readily engage in customized assembly tasks. For example, many consumers expend effort arranging vacations (e.g., reserving airline flights, car rentals, hotel rooms, events), even though a travel agent could make these arrangements postcustomization (Baker 2010).

There are a variety of reasons a consumer may choose to expend effort assembling a customizable product. It could be that it is more efficient to assemble a product oneself, that the act of assembly provides information that alters customization decisions, or that third party assembly is not available. However, we expect that there is an additional reason for engaging in customized assembly. There may be situations in which the effort involved in customized assembly is enjoyable. In particular, we argue that when a task is structured so that customization and assembly are interdependent events, assembly effort becomes a positive experience. Alternatively, when a task is structured so that customization and assembly are independent events, assem-

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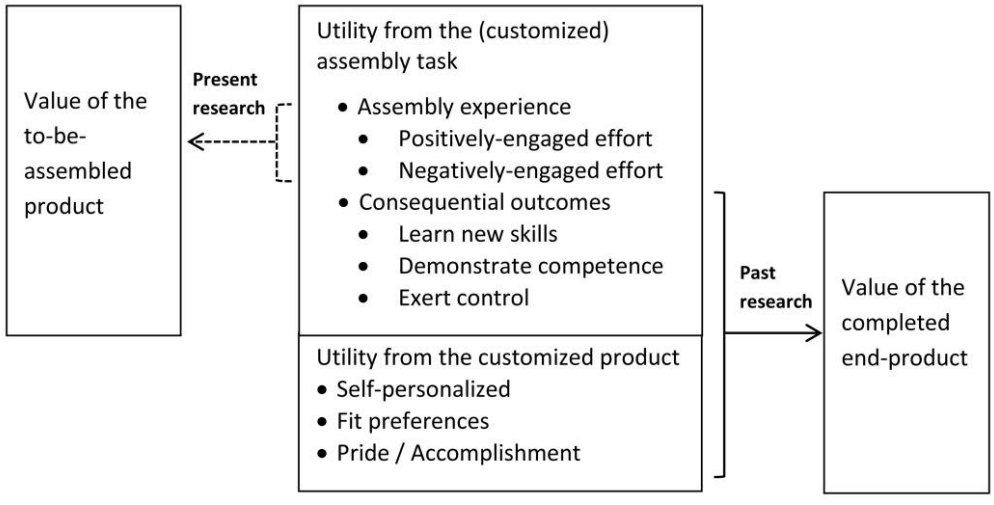
FIGURE 1

SOURCES OF UTILITY FROM A CUSTOMIZED ASSEMBLY TASK



bly effort becomes a negative experience. When assembly experiences are positive (negative), more assembly effort should increase (decrease) the value of the experience and, by extension, the perceived value of the materials that afforded the experience (i.e., the to-be-assembled product).

Our focus on the customized assembly experience and its influence on the value of the materials that afforded the experience (i.e., the to-be-assembled product) allows us to speak to repeat purchasing in product categories where consumers have the opportunity to frequently engage in customized assembly (e.g., crafting, gourmet cooking, coordinating clothing). In these product categories, companies should be able to structure customized assembly tasks so that the assembly experience is more valued. When customized assembly tasks are appropriately structured, companies should be able to charge consumers for the opportunity to assemble the customizable product. For example, consumers should be willing to pay more to assemble a customized piece of jewelry (e.g., Potomac Bead Company) than to acquire an equivalent piece of jewelry that has been assembled by a third party.

We begin with a review of past evidence showing that customization and assembly independently influence the perceived value of a successfully assembled product. Next, we discuss why the experience accompanying customized assembly should influence the value of the materials that afforded the experience (i.e., the to-be-assembled product). We follow with empirical evidence showing that the structure of a customized assembly task determines whether the assembly effort is experienced as a cost or a benefit. When customization and assembly are segregated (integrated) activities, assembly effort is an onerous (inviting) task that results in a negative (positive) experience. The experience that accompanies customized assembly influences the value of a to-be-assembled product, as opposed to the completed end-product, because the to-be-assembled product afforded the assembly experience. We conclude with a discussion of other types of customized assembly experiences that might positively influence the value of to-be-assembled products and the extent to which these experiences might generalize to similar products in the category.

CUSTOMIZED ASSEMBLY

Studies investigating product customization, or assembly, identify two sources of utility that influence the value of the completed end-product: (*a*) utility derived from having successfully engaged in assembly and (*b*) utility derived from the customized product itself. Both sources of utility have been shown to exert a positive influence on the value of the completed end-product via a variety of mediational processes (see fig. 1). Successful product assembly yields utility because it allows a person to (1) learn new skills (Etgar 2008; Lusch et al. 1992); (2) demonstrate a sense of competence (Dahl and Moreau 2007; Mochon, Norton, and Ariely 2012; Norton, Mochon, and Ariely 2012); and (3) exert control over a situation (Bateson 1985). Customization yields utility because it allows consumers to (1) express their identity (Franke and Schreier 2008; Franke, Schreier, and Kaiser 2010; Herd and Moreau 2011); (2) fit products to existing preferences (Delleart and Stremersch 2005; Deng and Hutchinson 2011; Franke and Piller 2004); and (3) experience feelings of pride and accomplishment (Bendapudi and Leone 2003; Deng and Hutchinson 2011).

Utility Derived from the Customized Assembly Experience

To date, the utility derived from customization and successful assembly has been measured by the value consumers placed on the completed end-product (see fig. 1). Furthermore, customization and assembly have been studied in isolation, perhaps because there was no reason to expect that these activities interacted, especially with respect to the value of a completed end-product (see Dahl and Moreau [2007] for an exception). Yet the value of a completed end-product is not the only outcome of economic significance. Consumers value the experiences products provide, and these experiences influence repeat purchase decisions (Addis and Holbrook 2001; Holbrook and Hirschman 1982). Thus, we anticipate that the experience of customized assembly is relevant to the value consumers place on the value of the materials that afforded the experience (i.e., the to-be-assembled product) and the willingness to engage in future acts of customized assembly. For this reason, it is important to understand the factors that influence the value of a customized assembly experience.

There are two ways in which customized assembly might influence the utility of an assembly experience and, consequently, the value of the materials that afforded the experience. One possibility is that more opportunity to customize creates more utility, whereas more assembly effort creates less utility. Economic theory argues that labor is a cost; thus, it should follow that the effort expended during the assembly of a product should be subtracted from the value of a to-be-assembled product (Bendapudi and Leone 2003; Dellaert and Stremersch 2005; Etgar 2008). If so, a strategy for creating a valued customized assembly experience would be to maximize customization opportunities, while limiting the amount of effort required for assembly. A second possibility is that characteristics of the customized assembly process determine whether assembly effort is experienced as utility or disutility. If so, a strategy for creating valued customized assembly experiences would be to identify task structures that transform assembly effort into utility, while avoiding task structures that transform assembly effort into disutility. We discuss this second possibility in more detail.

Effort as Utility or Disutility

A number of perspectives suggest that the characteristics of a task determine whether the effort expended during the task is experienced as a positive or negative event (Arnould and Price 1993; Csíkszentmihályi 1996; Dahl and Moreau 2007; Deci and Ryan 1985; Hirschman and Holbrook 1982). Common to these perspectives is the idea that different combinations of autonomy (i.e., choice), mastery (i.e., skill), and challenge (i.e., difficulty) can make a task engaging or disengaging and, thus, make the effort expended on the task positively or negatively valued. First, the literature on experiential consumption suggests that a combination of choice, personal control, and extraordinary effort creates experiences that are engaging and valued (Arnould and Price 1993; Hirschman and Holbrook 1982). Effortful experiences lacking one or more of these dimensions are experienced as difficult and unfulfilling. Second, when (1) the environment provides sufficient structure and (2) people have the autonomy to choose behaviors, investments of effort are perceived as more intrinsically motivating (Deci and Ryan 1985; Ryan and Deci 2000) and enjoyable (Dahl and Moreau 2007). If a task is too ambiguous or regimented or if control over decision making is taken away, the experience will be less enjoyable and effort will be perceived as taxing. Third, flow theory discusses how tasks that are goal-directed, feedback-oriented, and calibrated to a person's level of skill can engage a person so that task effort is experienced as enjoyment (Csíkszentmihályi 1996). Tasks that do not conform to these requirements are less likely to sustain interest. Across these perspectives, task characteristics shape the perception of experienced effort.

Structuring Customized Assembly Tasks

The characteristics of a customized assembly task that allow for autonomy and perceived control should determine if the task encourages engagement or disengagement and whether increased effort creates utility or disutility. We propose that when the autonomy of customization and the control of assembly are both simultaneously present and integrated, the assembly task should be more positive, engaging, and creative. Specifically, we hypothesize that when customization and assembly are coupled, consumers should be more positively engaged in the customized assembly task, and more effort should result in more utility. When customization and assembly are decoupled, consumers should be negatively engaged in the customized assembly task and more effort should result in more disutility, as predicted by economic theory. Consequently, the utility from the assembly experience should influence the value of the materials that afforded the experience (i.e., the to-be-assembled product).

H1: When consumers are positively (negatively) engaged in a customized assembly task, as when customization and assembly are integrated (segregated), more assembly effort will lead to a greater (lesser) valuation of the to-be-assembled product.

There is empirical support for the idea that being positively engaged in an experience will allow for greater effort to lead to greater utility from the experience. First, Carruthers (2008) argues that when novel thoughts and actions have the opportunity to be performed in concert (i.e., are intertwined or reciprocal), there will be more perceived utility in the experience, as is the case with play, dance, and athletics. Second, the more engaging a task, the more positive affect a person experiences (Abele-Brehm 1992). Third, the more effort one devotes to an engaging task (e.g., story writing), the greater the enjoyment with the task (Zenasni and Lubart 2011). Finally, when the selection and execution

of specific activities are coordinated, it results in an increase in task involvement, task persistence, and enjoyment with the task (Csíkszentmihályi 2008). Together, these findings imply that increasing the amount of effort devoted to an integrated customized assembly task should increase the positive engagement with the task and enhance the value of the materials that afforded the task (i.e., the to-be-assembled product).

STUDY 1

The goal of study 1 was to assess whether the structure of a customized assembly task could influence how people engage in and value an assembly experience. Consistent with hypothesis 1, we expected that when customization and assembly were integrated, a person should be positively engaged in the assembly task. As a consequence, more assembly effort should result in a greater valuation of the to-be-assembled product. When customization and assembly were segregated, a person should be negatively engaged in the assembly task. As a consequence, more assembly effort should result in a lesser valuation of the to-be-assembled product.

The hypothesis was tested using a customized assembly task in which participants created a simple craft. Participants were asked to assemble a Winter Holiday Elf by (1) cutting out adornment pieces (e.g., ears, mittens, shoes) from a collection of holiday wrapping paper (i.e., a customization decision) and (2) pasting these pieces onto a line-drawing of an elf (i.e., an act of assembly). After performing the customized assembly task, participants were asked to value the kit used to assemble the elf.

The critical manipulations were the timing of the customization decisions and the assembly activity, as well as the amount of effort expended on the task. In the assemble-as-you-go condition, assembly was performed after each adornment piece was cut out from the wrapping paper. This procedure allowed the customization and assembly to be integrated, presumably leading to positive engagement in the activity. In the assemble-at-the-end condition, the assembly was performed after all adornment pieces had been cut out from the wrapping paper. This procedure kept the customization segregated from the assembly and was therefore likely to create negative engagement in the activity.

Potential Mediators

Our reading of the literature suggested that there were a number of processes that could mediate the influence of effort on the value of the to-be-assembled product in the integrated and segregated assembly conditions. Consequently, we measured multiple potential mediators in an attempt to document "a" mediating process (i.e., the mediating process given our stimuli and procedures) as opposed to "the" mediating process (i.e., a single mediating process that is operative across the domain of customized assembly tasks). All participants responded to all potential mediators.

First, we investigated three potential mediators that could account for the positive utility we expected to observe in the assemble-as-you-go (integrated) condition: *creativity, enjoyment*, and *imbuing self-identity* into the product. We measured creativity because Burroughs and Mick (2004) have shown that imbuing creativity into a product repair experience creates positive utility. We measured enjoyment because Franke and Schreier (2010) have shown that an enjoyable customization experience can lead to an increased valuation of a completed end-product, so it is possible that an enjoyable assembly experience could increase the valuation of a to-be-assembled product (see also Dahl and Moreau 2007). We measured the extent to which self-identity was imbued in the product because Herd and Moreau (2011) have shown that a salient self-identity can lead to a greater satisfaction with a customized product, provided design freedom is high. Thus, it is possible that imbuing self-identity into an assembled product could increase the valuation of a to-be-assembled product.

Second, we measured two potential mediators that could account for the disutility we expected to observe in the assemble-at-the-end (segregated) condition: *tediousness* and *irritation*. We measured tediousness because repetitive, boring tasks have been shown to encourage disengagement from a task (Deci and Ryan 1985). Disengagement is an indicator of declining or negative utility in an experience. We measured irritation because it exemplifies boredom with an active task, thus possibly becoming a source of disutility when effort is increased (O'Hanlon 1981).

Finally, we measured two potential mediators that could account for the positive utility in the assemble-as-you-go (integrated) condition and disutility in the assemble-at-the-end (segregated) condition: *engagement* and *efficiency*. We measured engagement because Deci and Ryan (2000) have amassed evidence that intrinsic motivation is exemplified by feelings of engagement with an activity. We measured efficiency because time is a psychological cost for consumers. Assembling at a pace that was slower or faster than anticipated could lead to a more negative or positive assembly experience (Etgar 2008).

Method

Participants and Design. One hundred and seventy-nine undergraduate business students at the University of Florida participated in return for extra credit. Participants were randomly assigned to conditions in a 2 (method of assembly: assemble-as-you-go [integrated] vs. assemble-at-the-end [segregated]) × 2 (amount of effort: low vs. high) between-participants factorial design. Twenty participants were removed from the sample because they completed the elf assembly task incorrectly (i.e., they did not paste the holiday paper onto the elf), and three participants were removed because they did not complete the questionnaire. This left a final sample of 156 participants.

Materials and Procedure. The materials for the assembly task were placed in the upper-left-hand corner of a private carrel. The materials included an instruction booklet, an 8 × 11.5-inch sheet of paper with a line-drawing of an

elf, eight assorted pieces of 3 × 3-inch holiday wrapping paper, a glue stick, and scissors.

After being seated, participants were asked to use the instruction booklet to complete the experiment. Participants read that a local entrepreneur had contacted the university's marketing department for assistance in valuing preschool "art activity kits." It was explained that art activity kits are designed for preschool children (ages 3–5). Further, kits could not sell for more than $1 each because of limited teacher support budgets. Participants then read that they would complete an activity kit and subsequently be asked to value the kit.

In the assemble-as-you-go condition, participants were instructed as follows: "Below you will find two types of shoes. Pick the shoes you would like your elf to have (you have two options), select a piece of holiday wrapping paper, cut out both shoes from the paper, and paste them on the elf." The instruction booklet showed line-drawings of two pairs of shoes below the instructions. In the assemble-at-the-end condition, the phrase "paste them on the elf" was replaced by the phrase "put them aside (on the upper right-hand corner) of your desk." The assemble-at-the-end condition asked participants to paste all of the adornment pieces onto the elf at the end of the procedure.

The low- and high-effort conditions varied in the number of adornment pieces to be cut out and pasted on the elf. In the low-effort condition, participants were asked to cut out three adornments (shoes, ears, and a hat). In the high-effort condition, participants were asked to cut out eight adornments (shoes, ears, a hat, gloves, a collar, a gift, a belt, and coat buttons). There were always two options for each adornment (e.g., two pairs of shoes, two sets of ears).

Participants were interrupted near the end of their assembly process and asked to respond to the measures of the potential mediators. Participants in the assemble-as-you-go condition turned the page to find a set of mediator questions after the second (seventh) component. Participants in the assemble-at-the-end condition were asked to paste on two (seven) components and then turned the page to find the mediator questions. The mediator questions were introduced by stating: "Preschoolers need to value this activity if it is going to be purchased by teachers. Even though you are an adult, all adults have a 'bit of child' in them. Use that 'bit of child' to tell us how you feel about this activity." Participants were then asked to respond to seven questions about their assembly experience. They were asked to indicate how engaging ("How engaging is the elf activity?"), enjoyable ("How enjoyable is the elf activity?"), tedious ("How tedious is the elf activity?"), irritating ("How irritating is the elf activity?"), efficient ("How efficient is the process you are using to create the elf?"), self-identifying ("How much of yourself [your identity] are you putting into the creation of the elf?"), and creative ("How much creativity are you able to infuse into the design of the elf?") they found the assembly experience, using 7-point scales (labeled "not at all" to "very" for the first five items and "none" to "a lot" for the last two items).

Participants then completed the last component of the assembly process and responded to additional dependent measures. The first measure was the value of the to-be-assembled product (i.e., the Winter Holiday Elf kit). The specific wording was: "If you were a preschool teacher, how much would you be willing to pay for a single kit? A kit includes the elf sheet and the holiday wrapping paper (not the glue or scissors). Please provide an amount between $0 and $1." The response was open-ended. Participants then used 7-point scales to indicate how seriously they took the task, how much work it was to create the elf, a letter grade for their elf (scale points were labeled F, D, C, C+, B, B+, A; analyzed as a 1–7 interval scale), how much they enjoyed doing arts and crafts, and how much they enjoyed the winter holidays. Next, there was a measure included to help differentiate the influence of the assembly experience on the value of the to-be-assembled product from the value of the already-assembled product. Participants were told: "Above, we asked you to assume you were a preschool teacher and to value the elf kit. Now, we want you to assume you are a child who has created the elf. How much do you value the elf you just created? Please list an amount in cents." Finally, there were measures of gender and age.

Results

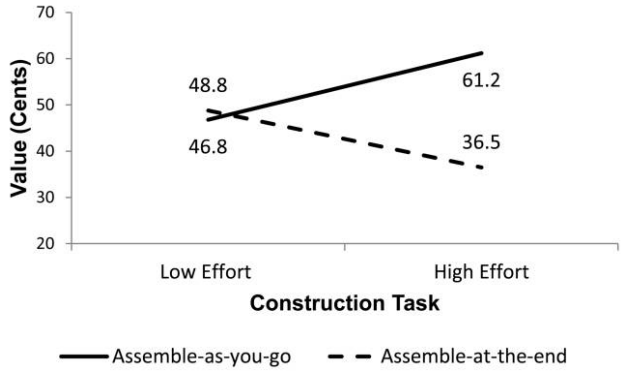
Manipulation Check. Participants reported that it was more work to create the elf in the high-effort condition ($M = 4.67$) than in the low-effort condition ($M = 3.44$; $F(1, 152) = 34.4$, $p < .05$). There was no influence of the method of assembly ($F(1, 152) = 1.60$, $p > .1$) or an interaction of the two variables ($F(1, 152) = 0$, $p > .1$) on the perceived amount of work.

Value of the To-Be-Assembled Product. The valuation of the kit was analyzed using a two-way ANOVA, with *method of assembly* and *amount of effort* as independent variables. The analysis revealed a significant method of assembly by effort interaction ($F(1, 152) = 11.46$, $p < .05$; see fig. 2). As predicted, increasing the amount of effort from low ($M = 46.8$) to high ($M = 61.2$) significantly increased the valuation of the kit for participants who assembled as-they-went ($F(1, 152) = 6.75$, $p < .05$). In contrast, increasing the amount of effort from low ($M = 48.8$) to high ($M = 36.5$) significantly decreased the valuation of the kit for participants who assembled at-the-end ($F(1, 152) = 4.81$, $p < .05$).

Value of the Already-Assembled Product. We anticipated that the experimental manipulations would influence the value of the already-assembled product (i.e., the completed end-product) differently than the value of the to-be-assembled product. The reason for this is that the experimental manipulations were designed to influence the customized assembly experience, not the outcome of the customized assembly. Two variables were analyzed to assess the value of the already-assembled product. There was no assembly by effort interaction on the letter grade participants assigned

FIGURE 2

RESULTS OF STUDY 1



to their already-assembled elf ($F(1, 152) = .68$, $p > .1$) or on the dollar value they assigned to their already-assembled elf ($F(1, 152) = .14$, $p > .1$). There was a main effect of effort on the letter grade assigned to the already-assembled elf ($M_{Low} = 4.65$, $M_{High} = 5.35$; $F(1, 152) = 8.33$, $p < .05$), but no other main effect approached significance for the letter grade or dollar value of the already-assembled elf measures.

Moderated Mediation. A moderated mediation analysis was used to assess the conditional indirect effects of the seven mediators on the value of the to-be-assembled product. The seven potential mediators were tested using model 8 from the PROCESS macro (Hayes 2012). The PROCESS macro allows the simultaneous assessment of the indirect effects of multiple mediators at each level of a moderator. That is, PROCESS can be used to determine which of the mediators were responsible for the increased utility from effort in the assemble-as-you-go condition and the decreased utility from effort in the assemble-at-the-end condition. The simultaneous testing of mediators makes the PROCESS macro a conservative test.

In the assemble-as-you-go condition, infusing creativity was a significant mediator (95% CI = .56, 9.22), whereas enjoyable (95% CI = −.76, 6.71), self-identifying (95% CI = −3.91, 10.18), irritating (95% CI = −3, 2), tedious (95% CI = −.16, 5.32), efficient (95% CI = −1.78, .43), and engaging (95% CI = −.54, 3.01) were not. In the assemble-at-the-end condition, irritating was a significant mediator (95% CI = −7.6, −.06), whereas enjoyable (95% CI = −5.13, 1.91), self-identifying (95% CI = −3.1, .66), infusing creativity (95% CI = −4.66, 2.63), tedious (95% CI = −.62, 4.33), efficient (95% CI = −3.14, .72), and engaging (95% CI = −.73, 2.35) were not. When only infusing creativity (95% CI = .95, 10.49) and irritating (95% CI = −8.01, −.31) were retained in a reduced model, their indirect effects remained significant in the assemble-as-you-go and assemble-at-the-end conditions, respectively.

Ancillary Study. In study 1, the measures of mediating processes were collected in the midst of the assembly process. This created the possibility that the act of measuring the mediating processes could have influenced the participants' assessment of the value of the to-be-assembled product. Thus, study 1 was rerun ($n = 94$) with the measures of the mediating processes removed from the procedure. The results replicated study 1. There was a significant method of assembly by effort interaction ($F(1, 90) = 12.38$, $p < .05$). As predicted, increasing the amount of effort from low ($M = 35.5$) to high ($M = 56.8$) significantly increased the valuation of the kit for participants who assembled as-they-went ($F(1, 90) = 8.03$, $p < .05$). In contrast, increasing the amount of effort from low ($M = 43.4$) to high ($M = 28.4$) significantly decreased the valuation of the kit for participants who assembled at-the-end ($F(1, 90) = 4.50$, $p < .05$).

Discussion

Study 1 showed that the effort associated with a customized assembly task could add or detract from the perceived value of the to-be-assembled product. When customization decisions and assembly actions were performed concurrently, more effort led to a higher valuation of the to-be-assembled product. The higher valuation was a consequence of participants feeling that they were infusing creativity into the assembly task. When customization decisions and assembly actions were performed separately, more effort led to a lower valuation of the to-be-assembled product. The lower valuation was a consequence of participants feeling that the assembly effort was irritating. The experimental manipulations did not have an equivalent influence on the value of the already-assembled product.

STUDY 2

Study 1 showed that the coupling of customization decisions and assembly actions made the assembly experience more creative and added value to the to-be-assembled product, whereas the decoupling of these two activities made the assembly experience more irritating and detracted value from the to-be-assembled product. These results suggest that it was the timing of the customization decision during the assembly task that encouraged participants to become positively engaged in the assembly experience, not the assemble-as-you-go process itself. One way to provide additional evidence for our hypothesis is, therefore, to separate the customization decisions from the assembly process in the assemble-as-you-go procedure. If participants had to create a plan of the components to be used in an assemble-as-you-go procedure prior to the assembly, then the assemble-as-you-go procedure should no longer encourage positive engagement in the assembly task. Instead, it should encourage negative engagement and, thus, influence the perceived value of the to-be-assembled product accordingly.

The prediction was investigated using the assemble-as-you-go procedure from study 1. The critical manipulation was the

timing of the customization decisions. The *no plan, assemble-as-you-go* condition was identical to the assemble-as-you-go procedure in study 1. The *plan, assemble-as-you-go* condition asked participants to select the type of holiday wrapping paper for each adornment at the beginning of the procedure, thus, separating the customization decisions from the assembly process. The two conditions were therefore identical except for the timing of the customization decisions (i.e., at each stage of assembly or prior to assembly). We anticipated that the no plan, assemble-as-you-go condition participants would value the elf kit more as additional adornments were added, thus replicating the results of study 1. We anticipated that the plan, assemble-as-you-go condition participants would value the elf kit less as additional adornments were added because preplanning would segregate the customization from the assembly task and make it negatively engaging.

Method

Participants and Design. One hundred and eighty undergraduate business students at the University of Florida participated in return for extra credit. Participants were randomly assigned to conditions in a 2 (planning: no plan, assemble-as-you-go vs. plan, assemble-as-you-go) × 2 (amount of effort: low vs. high) between-participants factorial design. Thirteen participants were removed from the sample because they completed the elf assembly task incorrectly (i.e., they did not paste the holiday paper onto the elf), and one participant was removed because the participant did not complete the questionnaire. This left a final sample of 166 participants.

Materials and Procedure. The materials and the procedure were similar to that used in study 1. The primary difference was the instruction booklet. In the no plan, assemble-as-you-go condition, the instructions were identical to study 1. Recall that participants were told: "Below you will find two types of shoes. Pick the shoes you would like your elf to have (you have two options), select a piece of holiday paper, cut out both shoes from the holiday paper, and paste them on the elf." The instruction booklet then asked participants to select and paste additional items, depending on the effort condition. In the plan, assemble-as-you-go condition, the instructions told participants to take the elf and the wrapping paper, decide what wrapping paper would be used for each of the three [eight] adornments (e.g., shoes, ears, hat), and record the plan by pasting a small piece of the wrapping paper in a box next to the name of each adornment, as listed on the first page of the instruction booklet. After the plan was created, the participant turned the page and engaged in the same adornment choices as participants in the no plan condition. The only difference was that participants had already selected the color of each adornment. Similar to study 1, participants were interrupted after all but one item had been pasted on the elf. All dependent measures were the same as in study 1.

Results

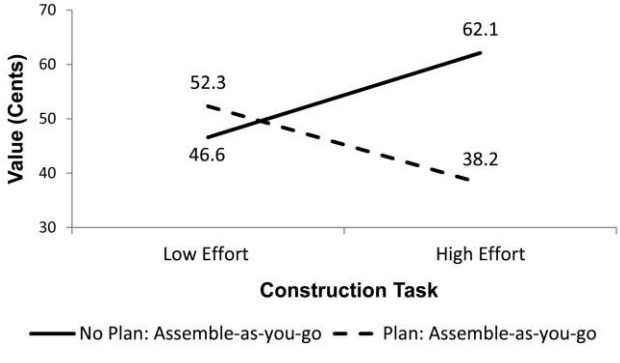
Manipulation Check. Participants reported that it was more work to create the elf in the high-effort condition ($M = 4.70$) than in the low-effort condition ($M = 3.87$; $F(1, 162) = 15.34$, $p < .05$). There was also an influence of planning ($M_{\text{No plan}} = 3.95$, $M_{\text{Plan}} = 4.59$; $F(1, 162) = 8.48$, $p < .05$), but no interaction of the two variables ($F(1, 162) = .47$, $p > .1$) on the perceived amount of work.

Value of the To-Be-Assembled Product. The valuation of the kit was analyzed using a two-way ANOVA, with *planning* and *amount of effort* as independent variables. The analysis revealed a significant planning by effort interaction ($F(1, 162) = 16.14$, $p < .05$; see fig. 3). As predicted, increasing the amount of effort from low ($M = 46.6$) to high ($M = 62.1$) significantly increased the valuation of the kit for participants who did not plan and assembled-as-they-went ($F(1, 162) = 8.38$, $p < .05$). In contrast, increasing the amount of effort from low ($M = 52.3$) to high ($M = 38.2$) significantly decreased the valuation of the kit for participants who planned and assembled-as-they-went ($F(1, 162) = 7.76$, $p < .05$). There was no influence of planning in the low-effort condition ($M_{\text{No plan}} = 46.6$, $M_{\text{Plan}} = 52.3$; $F(1, 161) = 1.20$, $p > .1$).

Value of the Already-Assembled Product. Two variables were analyzed to assess the value of the already-assembled product. First, there was no planning by effort interaction on the letter grade participants assigned to their already-assembled elf ($F(1, 162) = .62$, $p > .1$) or on the dollar value they assigned to their already-assembled elf ($F(1, 162) = 1.15$, $p > .1$). There was an influence of effort on the letter grade assigned to the already-assembled elf ($M_{\text{Low effort}} = 4.87$, $M_{\text{High effort}} = 5.28$; $F(1, 162) = 3.05$, $p < .1$), but no other main effect approached significance for the letter grade or dollar value of the already-assembled elf measures.

FIGURE 3

RESULTS OF STUDY 2



Moderated Mediation. The PROCESS macro was used to assess the conditional indirect effects of the seven mediators on the value of the to-be-assembled product (Hayes 2012). In the no plan, assemble-as-you-go condition, infusing creativity was a marginally significant mediator (93% CI = .01, 7.80), whereas enjoyable (95% CI = −1.44, 8.33), self-identifying (95% CI = −1.26, 4.70), irritating (95% CI = −5.73, .93), tedious (95% CI = −.77, 3.91), efficient (95% CI = −1.10, 1.81), and engaging (95% CI = −2.88, .97) were not. In the plan, assemble-as-you-go condition, irritating was a significant mediator (95% CI = −9.50, −.44), whereas enjoyable (95% CI = −8.83, .03), self-identifying (95% CI = −2.32, .46), infusing creativity (95% CI = −5.11, .54), tedious (95% CI = −.54, 2.51), efficient (95% CI = −.72, .82), and engaging (95% CI = −2.61, .63) were not. When only infusing creativity (95% CI = 1.15, 10.16) and irritating (95% CI = −11.59, −2.48) were retained in a reduced model, their indirect effects remained significant in the no plan and plan conditions, respectively.

Ancillary Study. Again, there was a concern that collecting measures of mediating processes in the midst of the product assembly could have influenced the participants' assessments of the value of the to-be-assembled product. Thus, study 2 was rerun ($n = 101$) with the measures of the mediating processes removed from the procedure. The results replicated study 2. The analysis revealed a significant planning by effort interaction ($F(1, 97) = 8.66$, $p < .05$). As predicted, increasing the amount of effort from low ($M = 36.9$) to high ($M = 52.6$) significantly increased the valuation of the kit for participants who did not plan and assembled-as-they-went ($F(1, 97) = 3.97$, $p = .05$). In contrast, increasing the amount of effort from low ($M = 50.0$) to high ($M = 34.9$) significantly decreased the valuation of the kit for participants who planned and assembled-as-they-went ($F(1, 97) = 4.79$, $p < .05$).

Discussion

Study 2 showed that the timing of the customization decision influenced participants' interpretation of the assembly effort. When customization decisions and assembly occurred concurrently, more effort led to a higher valuation of the to-be-assembled product. When customization decisions were made prior to assembly, more effort led to a lower valuation of the to-be-assembled product. Again, we argue that the concurrent execution of customization decisions and assembly effort allowed for participants to be positively engaged in the assembly task (i.e., infuse creativity into the process), so that more effort increased the utility of the assembly experience and the value of the to-be-assembled product. Preplanning customization decisions led participants to be negatively engaged in the assembly task (i.e., irritated by the process), so that more effort decreased the utility of the assembly experience and the value of the to-be-assembled product.

STUDY 3

We claim that customized choice and concurrent assembly encouraged participants to be positively engaged in the assembly task. Nevertheless, it is the positive engagement that is responsible for the increased utility that accompanies the assembly experience; the integration of the customization decisions and assembly is simply a theoretically and managerially relevant way of encouraging this engagement. If the type of engagement yields (dis)utility, it should be possible to manipulate whether or not an assembly task is positively/negatively engaging, independent of the timing of the customization decisions and the act of assembly. If a decoupled and negatively engaging customized assembly task (e.g., the assemble-at-the-end procedure) were reframed as a positively engaging assembly task, then nonconcurrent customization decisions and assembly should no longer encourage negative engagement in the assembly task. Instead, it should encourage positive engagement and, therefore, influence the perceived value of the to-be-assembled product accordingly.

This prediction was investigated using the assemble-at-the-end procedure from study 1. The critical manipulation was the mind-set during the assembly process. The procedure in the *no mind-set, assemble-at-the-end* condition was identical to the assemble-at-the-end condition in study 1. The procedure in the *positively engaged mind-set, assemble-at-the-end* condition asked participants to assemble the product using a specific frame of mind. Participants were asked to recall what it was like to be young, create art at school, bring that art home, and share it with family. They were then asked to adopt this frame of mind when assembling the product. Thus, our intent was to have the participants become positively engaged in the assembly task (Csíkszentmihályi 1996).

We anticipated that the no mind-set, assemble-at-the-end condition participants would value the to-be-assembled product less as additional adornments were added, thus replicating the results of study 1. We anticipated that the positively engaged mind-set, assemble-at-the-end condition participants would value the to-be-assembled product more as additional adornments were added.

Method

Participants and Design. Two hundred and six undergraduate business students at the University of Florida participated in return for extra credit. Participants were randomly assigned to conditions in a 2 (mind-set: no mind-set vs. positively engaged mind-set) × 2 (amount of effort: low vs. high) between-participants factorial design. Twenty-four participants were removed from the sample because they completed the bunny assembly task incorrectly (i.e., they did not paste the construction paper onto the bunny), and four participants were removed because they did not complete the questionnaire. This left a final sample of 178 participants.

Materials and Procedure. The assembly task was changed to an Easter Bunny Kit because the data were gathered in the

spring semester, in the months prior to the Christian holiday Easter. The materials included an instruction booklet, an 8 × 11.5-inch sheet of paper with a line drawing of an Easter Bunny, construction paper, a glue stick, and scissors.

The procedure was similar to that used in the assemble-at-the-end procedure of study 1, with the following changes: In the *low-effort* condition, participants were asked to cut out three adornments (feet, ears, and tail). In the *high-effort* condition, participants were asked to cut out eight adornments (feet, ears, tail, a tie, teeth, a basket, a prop, and a head decoration).

The no mind-set, assemble-at-the-end procedure was identical to the assemble-at-the-end procedure used in study 1. In this procedure, participants selected each adornment from a set of two, cut it out, and placed it to the side. The adornments were pasted on the bunny after they all had been cut out. The positively engaged mind-set, assemble-at-the-end procedure included an additional instruction just prior to the pasting of the pieces on the bunny. Participants were reminded that the project was supposed to appeal to 3–5-year-olds and then were told: "Recall that when you did an art project, you were doing it so that it could be placed on a wall in the classroom or on the refrigerator at home. In order to help you recreate this perspective, we want you to list three types of art you brought home from school at that age." After listing three pieces of art, participants were asked to describe how they felt when they brought art home and to try to recreate the experience of a 4-year-old working on art as they pasted their pieces onto the bunny.

Similar to studies 1 and 2, participants were interrupted after all but one item had been pasted on the bunny. All dependent measures were the same as in studies 1 and 2.

Results

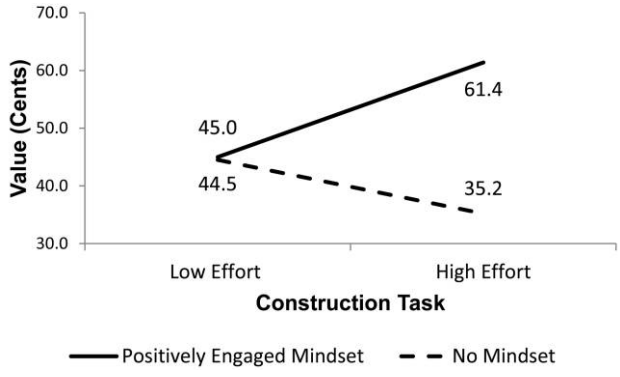
Manipulation Check. Participants reported that it was more work to create the bunny in the high-effort condition ($M = 4.52$) than in the low-effort condition ($M = 3.55$; $F(1, 174) = 18.69$, $p < .05$). The mind-set manipulation ($F(1, 174) = .04$, $p > .1$) and the interaction between effort and the mind-set manipulation ($F(1, 174) = 1.93$, $p > .1$) did not influence the perceived amount of work.

Value of the To-Be-Assembled Product. The valuation of the kit was analyzed using a two-way ANOVA, with *mind-set* and *amount of effort* as independent variables. The analysis revealed a significant mind-set by effort interaction ($F(1, 174) = 13.55$, $p < .05$; see fig. 4). As predicted, increasing the amount of effort from low ($M = 45.0$) to high ($M = 61.4$) significantly increased the valuation of the kit for participants in the positively engaged mind-set condition ($F(1, 174) = 11.22$, $p < .05$). In contrast, increasing the amount of effort from low ($M = 44.5$) to high ($M = 35.2$) significantly decreased the valuation of the kit for participants in the no mind-set condition ($F(1, 174) = 3.49$, $p = .06$).

Value of the Already-Assembled Product. Two variables were analyzed to assess the value of the already-assembled product. First, there was no mind-set by effort interaction on the letter grade participants assigned to their already-assembled bunny ($F(1, 174) = .64$, $p > .1$) or on the dollar value they assigned to their already-assembled bunny ($F(1, 174) = .05$, $p > .1$). There was an influence of effort on the letter grade assigned to the already-assembled bunny ($M_{\text{Low effort}} = 5.32$, $M_{\text{High effort}} = 5.74$; $F(1, 174) = 3.96$, $p < .05$), but no other main effect approached significance for the letter grade or dollar value of the already-assembled bunny measures.

FIGURE 4

RESULTS OF STUDY 3



Moderated Mediation. The PROCESS macro was used to assess the conditional indirect effects of the seven mediators on the value of the to-be-assembled product (Hayes 2012). In the positively engaged mind-set condition, infusing creativity was a significant mediator (95% CI = .30, 8.53), whereas enjoyable (95% CI = −1.21, 1.58), self-identifying (95% CI = −1.06, 3.72), irritating (95% CI = −8.07, .12), tedious (95% CI = −1.36, 2.72), efficient (95% CI = −.96, .88), and engaging (95% CI = −1.65, 3.2) were not. In the no mind-set condition, irritating was a significant mediator (95% CI = −16.84, −3.64), whereas enjoyable (95% CI = −2.64, .62), self-identifying (95% CI = −.86, 3.06), tedious (95% CI = −1.82, 3.06), efficient (95% CI = −.98, 1.35), and engaging (95% CI = −1.92, 2.98) were not. Unexpectedly, infusing creativity was also a significant mediator (95% CI = .002, 6.03) in this condition. When only infusing creativity (95% CI = .66, 7.84) and irritating (95% CI = −15.37, −3.88) were retained in a reduced model, their indirect effects remained significant in the positively engaged and no mind-set conditions, respectively.

Ancillary Study. Again, there was concern that collecting measures of mediating processes in the midst of the product assembly activity could have influenced the participants' assessments of the value of the to-be-assembled product. Thus, study 3 was rerun ($n = 119$) with the measures of the mediating processes removed from the procedure. The results replicated study 3. The analysis revealed a significant

mind-set by effort interaction ($F(1, 115) = 8.70$, $p < .05$). As predicted, increasing the amount of effort from low ($M = 50.3$) to high ($M = 65.5$) significantly increased the valuation of the kit for participants in the positively engaged mind-set condition ($F(1, 115) = 5.21$, $p < .05$). In contrast, increasing the amount of effort from low ($M = 55.5$) to high ($M = 42.8$) significantly decreased the valuation of the kit for participants in the no mind-set condition ($F(1, 115) = 3.59$, $p = .06$).

Discussion

Study 3 directly manipulated the participants' mind-set in order to transform a customized assembly task that would typically result in negative engagement into a task that resulted in positive engagement. When participants were positively (negatively) engaged in the customized assembly task, more effort led to a higher (lower) valuation of the to-be-assembled product. The positively engaged mind-set encouraged participants to infuse creativity into the assembly task, which in turn increased the value of the to-be-assembled product. When there was no mind-set, the negative engagement made the assembly task irritating, which in turn decreased the value of the to-be-assembled product.

GENERAL DISCUSSION

Investing effort in the customized assembly of a product can increase or decrease the value of the to-be-assembled product that afforded the assembly experience. Study 1 found that higher assembly effort led to a higher valuation of a to-be-assembled product when customization and assembly were integrated and positively engaging but led to a lower valuation of a to-be-assembled product when customization and assembly were segregated and negatively engaging. Study 2 showed how preplanning customization decisions could segregate customization from assembly, turning a positively engaging experience into a negatively engaging experience. Study 3 showed that a creativity mind-set could change a negatively engaging customization and assembly task into a positively engaging experience. Together, the studies contribute to our understanding of when and how the assembly of a product can allow for an experience that leads to a higher or lower valuation of a to-be-assembled product. They also provide evidence that product customization and assembly do not always create value, as previous research suggests (Franke et al. 2010; Herd and Moreau 2011; Norton et al. 2012).

Theoretical Implications

Our results speak to Dahl and Moreau's (2007) recommendations concerning how to structure customized assembly tasks. Dahl and Moreau have provided evidence that design freedom is not always beneficial; a customized assembly process may have to be structured when the assembly process is complex and potentially overwhelming. Our findings suggest that—keeping design freedom constant—some structured assembly tasks can also create less utility than unstructured assembly tasks. Customized assembly tasks are a mix of freedoms and constraints, each having the potential to influence the utility derived from the assembly experience. Although it might be conceptually convenient to assume that all constraints create disutility and all freedoms create utility, both our work and that of Dahl and Moreau (2007) suggest that it is the interaction between constraints and freedoms that maximizes utility (see also Deng and Hutchinson 2011). Whether utility or disutility is derived from the assembly experience depends on how the assembly experience is perceived (e.g., a creative, self-assuring act versus an irritating, boring effort), which requires a fine balance between freedom and structure. This suggests that other combinations of assembly constraints and freedoms (e.g., structure and outcome ambiguity, effort and design flexibility, hierarchical assembly and breadth of choice) could influence the utility/disutility derived from the assembly experience as well.

The findings also further our understanding of the value of creativity, a topic that is underresearched in the consumer behavior domain (Burroughs, Moreau, and Mick 2008; Dahl and Moreau 2007; Sellier and Dahl 2011). The results show that an assembly process should incorporate both action/effort and the freedom to create in order to yield utility. Consistent with the Geneplore Model (described in Finke, Ward, and Smith [1992]), the generation and the exploration inherent in the creative process should be temporally integrated for utility to emerge. This may explain the appeal of creative acts such as art, music, literature, and dance. These types of creative endeavors generate a utility in experience and hence are self-reinforcing. In other words, when customized assembly affords valued experiences, it may further the need for additional creative experiences in the domain, leading to a self-reinforcing circle of creativity and positive affect (Isen, Daubman, and Nowicki1987; Moreau and Dahl 2005). Furthermore, as demonstrated in this research, deriving utility from customized assembly experiences creates value for the products that afford these experiences and likely encourages additional consumption. Therefore, there is an opportunity to investigate how infusing creativity into product assembly enhances intrinsic involvement with other products within the same product category (Sellier and Dahl 2011).

The findings also raise an interesting conceptual issue. When should a customized assembly task influence the value of a to-be-assembled product versus the value of a completed end-product? Our contention is that it is the utility in the assembly experience itself, as opposed to the inferences and attributions made subsequent to engaging in the assembly task, that influences the value of the to-be-assembled product. Our view implies that there could be situations in which there is disutility in an assembly experience (i.e., the value of the to-be-assembled product declines as a consequence of assembly) and utility in the assembly outcome (i.e., the value of the end-product increases), or vice versa. For example, a person might be negatively engaged in the assembly

of a craft (i.e., executing the craft is painful and time-consuming) but be quite proud of the outcome. The opportunity is to understand the moderators that encourage the person to rely on the experience versus the outcome when deciding whether or not to complete a similar craft.

Practical Implications

The findings have practical implications for marketers. Having consumers engage in customized assembly can have beneficial effects on the value of the to-be-assembled product if consumers experience the assembly as positively engaging. Furthermore, our findings provide important suggestions about how to structure any given consumer activity to maximize value derived from the activity. Importantly, and in contrast to previous research on customization, our findings suggest that value can be created for unbounded activities where there is no immediate end product (e.g., a vegetable garden) or activities where the end product is of less importance due to repeat production and timely consumption (e.g., gourmet cooking). For example, while a vegetable garden involves many tangential activities (e.g., soil preparation, planting, pest control, fertilizing, tending), each of these activities can be infused with choice and executional control. Similarly, gourmet cooking provides choices in ingredients (substitutes), cooking technique, and plating while at the same time providing control over these activities. Encouraging the integration of customization decisions and assembly tasks should create positive engagement in the activity. Consequently, novice chefs can be transformed into enthusiasts.

Importantly, infusing choice might be particularly value enhancing for consumption activities involving a great deal of effort and activity (e.g., exercising), as they may alter retrospective perceptions of the value of these activities. For example, high-effort exercise sessions could incorporate choice into the session, which should add utility to the experience. Consequently, the retrospective value of each individual exercise should increase. Consistent with this claim, Dishman et al. (2005) found that giving children more choice when engaged in physical activity increased their enjoyment and self-efficacy, which in turn led to greater current and future physical activity. The same may be true for other activities involving high levels of choice and effort, such as social interactions (e.g., relationships, child-rearing) and willpower behaviors (e.g., studying, dieting). Indeed, marriage counseling, tutoring, and rehabilitation have been shown to be more successful when the effort put into the program is accompanied by real-time, autonomous decisions (e.g., creative problem solving; Deci and Ryan 2000). In effect, these are situations where the solution to a problem is creatively assembled.

Limitations and Future Research

What remains unclear is what type of customized assembly effort will amplify (dis)utility. Future research should address whether the effort expended has to be physical effort, as in our experiments, or whether it can also be cognitive effort (Burroughs and Mick 2004). Furthermore, one could assess whether our findings can be generalized to computerized customization, which has become an important tool in product customization (Deng and Hutchinson 2011). It is unclear whether selecting online options can create the same experience as hands-on assembly. If online effort is similar to hands-on assembly, our findings suggest that online tools should be interactive so that the choices and the assembly are integrated. If online effort is dissimilar from hands-on assembly, it would be important to determine how different sources of effort (e.g., number of activities, ambiguity concerning the order in which activities should be performed, contingencies between performed activities) interact with execution factors to create positive or negative engagement in a customized assembly task.

Future research could also assess when the higher (lower) valuation of a to-be-assembled product generalizes to similar to-be-assembled products. We anticipate that generalization is more likely to occur in three situations. First, as the to-be-assembled product and the associated product become more similar (i.e., similar components, assembly activities, and benefits of the assembled product), generalization should be more likely. For example, one would expect that being positively engaged in the assembly of one needlepoint activity should influence the appeal of a second needlepoint activity. Second, as knowledge about customized assembly increases (e.g., a person becomes more of an expert hobbyist), generalization should be more likely. Third, there are likely to be traits (e.g., need for creativity, expertise) that encourage generalization.

Finally, a caveat of this research is that it does not allow for a definitive assessment of the point at which a task becomes positively or negatively engaging. The present work shows that utility from an experience emerges when an activity involves a balance between task complexity, autonomy, structure, and effort. The precise amount of each of these components, however, is not specified (e.g., how much effort is necessary to make a task positively or negatively engaging?). Future research could explore when positive or negative engagement emerges in a novel task, is triggered in a familiar task, or changes over time. It could also explore when a task goes from positively to negatively engaging, or if a customized assembly task might require intermittent positive or negative reinforcers in order for positive or negative engagement to emerge. It may be that a customized assembly task has to afford an experience of mastery, and that it is this mastery that encourages positive engagement (or lack thereof that encourages negative engagement). Finally, in the case of negative engagement, it must be that completion of the task is more important than experienced utility, as negative engagement would encourage disengagement from the task.

Conclusion

In summary, the current research provides insight into the (dis)utility created by a customized assembly task. To the extent that a customized assembly task is structured to encourage positive (negative) engagement in the task, consumers will perceive more (less) utility in the experience

and the value of the materials that afforded the experience. Consumers who perceive more (less) value in to-be-assembled products should be more (less) likely to repeat purchase the same or similar to-be-assembled products.

DATA COLLECTION INFORMATION

The second author supervised the collection of data for all of the studies. Data were collected in the University of Florida Behavioral Lab between November 2010 and February 2013. The data were collected by lab managers supervised by the second author. The second author analyzed the data.

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