

RUNNING HEAD: Restricted Choice Can Increase Creativity

Focus! Creative Success Is Enjoyed Through Restricted Choice

ANNE-LAURE SELLIER*

DARREN W. DAHL

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* Anne-Laure Sellier is Clinical Assistant Professor of Marketing, Leonard N. Stern School of Business, New York University, 40 West 4th Street, Tisch Hall, Suite 811, New York, NY 10012-1126 (telephone: +1-212-998-0553; email: asellier@stern.nyu.edu). Darren W. Dahl is the Fred H. Siller Professor in Applied Marketing Research, Sauder Business School, University of British Columbia, 160-2053 Main Mall, Vancouver, BC, V6T 1Z2 Canada (telephone: +1-604-822-8346; email: darren.dahl@sauder.ubc.ca).

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ABSTRACT

A lay belief is that more choice of creative inputs boosts consumer creativity because it expands consumers' creative solution space. Utilizing a knitting and crafting context in two experimental studies, the research reported here challenges this intuition to suggest that restricting the choice of creative inputs actually enhances creativity for experienced consumers. The authors find that this outcome is due to the consumer's ability to enjoy the creative process more, which in turn positively affects their creative output as judged by experts. In contrast, consumers perceive themselves as more creative (regardless of experience level), the greater the choice of inputs they are provided. The authors discuss how these findings open up new avenues for research on creativity and choice overload.

Keywords: Creativity; Post-purchase experience; Enjoyment; Choice overload

Considerable research on consumer creativity has established its importance for marketing (e.g., Franke, Schreier and Kaiser 2010; von Hippel 2005). Consumers are both increasingly offered the opportunity to customize their products and experiences and actively seek to customize them (e.g., Franke and Piller 2004; Moreau and Dahl 2009; von Hippel 2005). This trend makes consumers' ability to come up with creative solutions to their needs an important antecedent to their consumption satisfaction. As a result, it is critical to study contextual factors pertaining to the consumption environment that enable consumers to be creative (Burroughs and Mick 2004; Moreau and Dahl 2005). The present research contributes to this literature by exploring the influence of input choice in consumer creativity. Specifically, we ask: does increasing choice in the number of creative inputs offered to consumers (e.g., more choice in ingredients for cooking, or paint options for an art project) affect their creativity? And more so, does the experience level of the consumer, with respect to the creative task, play a role in the outcomes realized? We examine how the number of creative inputs that an experienced versus inexperienced consumer can choose from influences both the perception of his/her own creativity and the actual objective realization of creative output.

We draw on the choice literature (e.g., Csikszentmihalyi 1990; Schwartz 2004) to provide understanding for the counterintuitive effects we identify. Interestingly, in two experiments, we find that increasing the choice of creative inputs (from a moderate to an extensive choice set) for consumers experienced in a creative task can hurt objective creative outcomes. Indeed, consumers that have experience and knowledge in a creative pursuit are shown to be objectively less creative with more input choice, while inexperienced consumers are relatively unaffected by differences in input choice. These effects on actual creativity stand in sharp contrast with consumers' perception of their own creativity: regardless of their experience level, we find that

consumers perceive themselves as being more creative, when they have more choice. Thus, restricting choice can benefit objective creativity but hurts creators' self-perception of creativity.

The notion that constraining the creative process can be beneficial is not new. This idea has been discussed in psychology (Costello and Keane 2000; Finke, Ward, and Smith 1992; Stokes 2001), and empirically observed in consumer research (see Moreau and Dahl 2009 for a review). Of particular interest, Moreau and Dahl (2005) found that the combination of restricting inputs and imposing input requirements on the creative process facilitates creative outcomes, because creators are forced off the path of least resistance, that is, these combined constraints force creators to move away from existing solutions to a problem (Ward 1994). We expand on this initial work, by providing further understanding of the way constraints benefit the creative process. First, we show that consumers' experience in a creative task is a critical moderator of the positive effects of constraint on creativity. For this reason, in contrast with prior research, we focus on creative tasks for which experience matters. Second, we demonstrate that restricting inputs *alone* impacts creativity, rather than the combination of *both* input restriction and input requirement in their studies. The implications are considerable managerially, given that marketers typically have control over the amount of choice they offer to consumers, but not over the input requirements. Our research also fundamentally differs in the type of input restrictions we examine. Moreau and Dahl's (2005) manipulation of input restriction involved half of their participants choosing five creative inputs they would work with, while the other half was randomly assigned five inputs. In contrast, we hold our participants' freedom to choose constant, and vary only the number of inputs that was offered. As a result, our participants do not differ in the extent to which choice is under their control. This difference is critical as prior research has

shown that consumers are more creative when they have more rather than less control over the situation (Burroughs and Mick 2004).

Third, we empirically document the process causing the effects we observe. We show that consumers that have a strong base of experience in a creative task enjoy the task far more when they have a constrained choice of inputs for the task. We argue that this enjoyment is derived from an improved ability to focus when choosing among moderate creative input options, and translates into more creative outcomes. By documenting this process, we answer the recent calls for research clarifying the reasons why increasing choice can hurt consumption, and emphasize the moderating role of experience in generating choice overload effects (Chernev, Böckenholt, and Goodman 2010; Scheibehenne, Greifeneder, and Todd 2010). However, while prior research has generally found that experienced consumers benefit from or are not affected by being provided more rather than less choice (Chernev 2003b; Mogilner, Rudnick, and Iyengar 2008), we find the opposite. In our general discussion, we suggest that the unique nature of creativity as a dependent variable may account for these seemingly discrepant results.

To summarize, our research makes three important contributions to the literature. First, we show that increasing input choice from a moderate to an extensive choice set has a deleterious effect on experienced consumers' actual creativity, but not for consumers with limited experience in the creative task. Second, we juxtapose the findings for objective assessment by showing that more choice in inputs creates an illusion for consumers (both experienced and inexperienced), who wrongly assume that they are more creative when they have an extensive rather than a moderate level of input choices to work with – confirming a lay belief that more is better. Third, we pinpoint enjoyment during the creative process as an

antecedent of creativity rather than a by-product of the creative process and document its role as the critical mechanism that underlies the choice effects we identify.

THEORETICAL BACKGROUND

Creativity and Consumption

Creativity is the production of novel, useful ideas or problem solutions (Amabile et al. 2005). Creative thinking follows similar principles as normative thinking (Ward, Smith, and Finke 1999), and it is the extent to which creative cognitive processes are used in coming up with a solution that determines the likelihood that a more creative idea will result (Ward, Smith, and Finke 1999). The Geneplore model (Finke, Ward, and Smith 1992) theoretically identified two critical cognitive inputs that consumers cycle between when they deal with a problem for which they must build a new solution themselves: generative and exploratory processes. The model suggests that generative processes are used initially to create preliminary mental representations of a solution, that involve retrieving existing structures from memory (Perkins 1981), and then generating combinations between these structures (Murphy 1988). Once a preliminary representation of a solution is available (e.g., a gourmet consumer can combine lentils, mushrooms, tomatoes, and broth to make a soup), the next stage of the creative task involves exploring different meanings to attach to and/or interpret this solution (e.g., if our gourmet consumer add bits of Parmesan cheese, s/he created an Italian lentil soup). At that stage, the solution is either given a satisfactory interpretation, or the creator generates another solution altogether (e.g., based on other ingredients that s/he may find). In sum, the Geneplore model

represents creative cognitive processing as an iterative process between generative and exploratory processes until a new solution the creator deems satisfactory is obtained.

Empirical research in marketing shows support for the use of these processes when consumers are creative (e.g., Burroughs and Mick 2004). Given this, it seems logical to believe that the more inputs that are available to this creative process, the better. In our lentil soup example, this suggests that the more extensive the set of ingredients that are available to the consumer, the more creative the eventual soup should be. Indeed, because increasing choice of inputs offers an increased solution space, extensive choice should increase the likelihood that a more creative solution is produced (Anderson 2006). Consistent with such thinking, suppliers of creative inputs (e.g., art stores, gourmet supermarkets) try to offer as many options as possible; the implicit assumption being that extensive choice helps when people are selecting inputs for a creative task. Most consumers also believe that more choice is better in this regard (Schwartz 2004). It follows that – independent of their actual creativity - consumers being provided with extensive rather than moderate choice of creative inputs should feel more creative. Formally, we hypothesize:

H1: Consumers' perception of their own creativity will be enhanced when they are provided with an extensive rather than a moderate choice set of creative inputs.

Choice and Creativity: The Moderating Role of Consumer Experience

Prior research has shown that in a number of contexts too much choice can lead to suboptimal decision outcomes (e.g., Baumeister et al. 2008; Chua and Iyengar 2008; Iyengar and

Lepper 2000; Schwartz 2004). Focusing on creativity, the provision of more rather than less choice of creative inputs can make the domain of possible creative solutions drastically greater. In this situation, we argue that consumers who are experienced in the creative task may produce suboptimal, less creative solutions. We hypothesize that this choice overload effect on creativity should only apply to consumers experienced in the creative task, because inexperienced consumers' lack of domain-relevant cognitive resources and technical skills should translate into a limited ability to combine inputs and interpret combinations, as well as successfully identify creative solutions. It follows that their ability to focus should remain unaffected by the level of input choices available, and they should therefore enjoy the creative process regardless of the level of input choices available (Amabile 1983; Weisberg 1999).

In contrast, experienced consumers have the domain relevant knowledge and skills that will allow them to be successful in developing creative solutions (e.g., Csikszentmihalyi 1996; Ericsson, Krampe, and Clemens 1993). The more choice of creative inputs experienced consumers have, the drastically greater their consideration set of potential creative solutions will be. Interestingly, while more choice of creative inputs theoretically increases the chance of a more creative solution being derived from the choice set, it also comes at a considerable cost: in order to successfully identify a truly creative solution, the experienced consumer will need to navigate a drastically greater domain of possible creative solutions, go through a greater number of generative and exploratory cycles, presumably experiencing heavily increased cognitive busyness in the process (Gilbert and Osborne 1989). Cognitive busyness, the mental state that arises as a result of cognitive load, was showed to compromise the use and availability of information, thereby impairing decision-making (e.g., Brandstätter, Lengfelder, and Gollwitzer 2001; Ferrari and Dovidio 2001). In other words, more choice makes experienced creators more

likely to lose their creative focus and thus be more prone to the hypothesized choice set effect. Prior research has identified creators' ability to focus their cognitive efforts "like a laser beam" as a critical trait of creative success (Csikszentmihalyi 1996), and we suggest that extensive choice compromises this ability to focus for experienced consumers. In sum:

H2: A moderate rather than an extensive input choice set will lead to greater objective creativity for experienced consumers, but not for inexperienced consumers.

Choice and Creativity: The Critical Role of Task Enjoyment

By what mechanism will creators' ability to focus impact their actual creativity? A critical aspect of the creative process is the extent to which consumers enjoy the creative experience (Henderson 2004; Russ 1993, 1999) as task enjoyment is often consumers' very reason for engaging in creative thinking (Csikszentmihalyi 1996; Moreau and Dahl 2009). In fact, prior research suggests that a positive experience enhances creativity (Csikszentmihalyi 1996; Frederickson 1998; Isen 1999). Extensive choice options, however, can generally cause anxiety (Csikszentmihalyi 1990), as can cognitive busyness (e.g., Smart and Verninsky 1977).

In the case of creative processing, we propose that anxiety can come from consumers exposed to extensive choice simultaneously pursuing many possible avenues for creative solutions, thereby losing their ability to focus their creative efforts on only a few promising creative paths. Prior research suggests that the ability to focus is a direct antecedent of creators' enjoyment of the creative task (Henderson 2004). Indeed, creators derive affective pleasure from an intensive focus, which enables them to get emotionally involved in the creative process

(Henderson 2004), an experience consistent with what Csikszentmihalyi (1990) has termed “flow”. A reduced focus will have spillover effects in the whole creative process, as less focused consumers will enjoy the entire creative experience less. In sum, because choice of creative inputs is an integral part of the creative process, we propose that too much choice adversely affects enjoyment of the creative process, which in turn hampers actual creativity.

We therefore conceptualize task enjoyment as a critical driver of the positive impact of restricting choice on actual creativity. Prior research showed that constraining the choice of creative inputs – comparing, in particular, creators who could choose their inputs versus being assigned their inputs – enhanced actual creativity but *decreased* task enjoyment (see Moreau and Dahl 2009 for a review). We suggest that the discrepancy between our prediction and these prior findings is due to creators’ freedom to choose not being held constant in prior research. In our experiments, all creators choose their inputs; unbeknownst to them, we vary the selection of inputs presented. This allows us to document, for the first time, the causal influence of task enjoyment on creativity. Thus far, task enjoyment was noted as a by-product of the creative process. This research suggests it has creative potential in and of itself, thereby supporting Csikszentmihalyi’s (1996b) remark that *“Perhaps the most important quality, the one that is most consistently present in all creative individuals, is the ability to enjoy the process of creation for its own sake. Without this trait, poets would give up striving for perfection and would write commercial jingles (...)”*

Of course, more choice does not necessarily negatively affect consumption experiences: If consumers know exactly what they want, more choice is likely to lead to a better experience because it is more probable that consumers will find a close match to what they desire (Chernev 2003a; Chernev 2003b; Schwartz 2004). However, creative outcomes are typically not well-

defined a priori (Guilford 1950; Newell and Simon 1972). In this type of situation, too much choice has been linked to decision-making paralysis, and generally found to be detrimental to consumers' emotional well-being (Schwartz 2004). As a result, we expect that moderate choice in creative consumption contexts should be conducive to a more enjoyable and playful creative experience, which in turn should transcend into the creative outcome.

H3: Consumers' enjoyment of the creative process mediates the influence of choice of creative inputs on objective creativity.

We tested our predictions in two creative settings. In a field study, experienced and inexperienced knitters created a scarf after choosing from a moderate versus a relatively extensive choice set of input materials. In a second study, we gained further support for our conceptualization by studying experienced crafters creating a Christmas tree ornament after choosing creative components from a moderate versus a relatively extensive choice set.

EXPERIMENT 1: A STUDY IN RECREATIONAL KNITTING

Method

Recreational knitting offers several advantages for research on consumer creativity. First, it provides a number of creative opportunities, as the process itself involves substantial choice in both materials and approach taken. Second, the choice of inputs marks the beginning of the creative process, because a knitter needs to know (1) how many skeins of a specific yarn they

need to buy and (2) have a sense of how the yarn will look once knit. Thus, our setting ensured that the creative process started at the same time for all participants. Note that yarn bought is wound into skeins, which makes returns impossible. Therefore, choosing is a binding phase in the creative process – any change in the yarn used comes at an additional cost. Third, studying the impact of increasing choice on creativity in the context of knitting offers direct practical relevance: Yarn stores typically offer a wide choice of yarn (varying in thickness, material and color), presented in unwound skeins stacked on top of one another up to the store's ceiling. These outlets illustrate the implicit belief in retailing that more choice of inputs is better – or at least will not hurt the creative process. Finally and importantly, our setting allowed us to observe the impact of a subtle manipulation – the provision of a moderate versus extensive choice – on a weeklong creative task, therefore providing solid ecological validity to our findings.

Overview. The study was a 2 (Choice: moderate vs. extensive) x 2 (Knitting level: experienced vs. inexperienced) between-subjects design facilitated by Purl Soho, a yarn store promoting creative knitting, where knitters received instructions and materials. Experienced and inexperienced knitters knitting primarily for creative expression were recruited through the store, from knitting blogs (e.g., ravelry.com), or associations (e.g., Stitch N' Bitch). The study was presented as an investigation of creativity requiring participants to knit a scarf over a one-week period. Knitters with at least a beginner level (i.e., they could knit, purl, and had knit at least one scarf) were invited to the store to take part in the study.

Participants and experience categorization. $N = 76$ recreational knitters (2 men, 74 women, mean age = 29.82 years) participated in return for a \$20 gift certificate for yarn. Before the data collection, discussion with knitting instructors indicated that knitting experience was best captured as a step function versus a continuous process. These instructors unanimously

agreed that a discriminating criterion between experienced and inexperienced knitters was the ability to knit cables (i.e., a knitting stitch that produces a pattern resembling the twist of a usually two-ply cable). For this reason, in the study, we categorized participants who could not knit cables as inexperienced, and participants who could knit cables as experienced. A pretest with knitters ($N = 27$) confirmed this categorization. Specifically, pretest participants were asked if the ability to complete a series of stitches and projects (i.e., knit a scarf, hat, cable, or i-cord) would be good criteria to distinguish experienced from inexperienced knitters on a seven-point scale (1 = very bad criterion/7 = very good criterion). Only stitching cables was shown to be rated significantly higher than the midpoint ($M = 4.96$, $t(26) = 4.96$, $p < .001$, $r^2 = .49$). Using 1-7 scales, these participants also indicated their agreement to four statements that indicated knitting cables was the mark of an experienced knitter (e.g., “A solid level in knitting is required before learning to knit cables” / “When a knitter tells me they know how to knit cables, I infer s/he is an experienced knitter”, $\alpha = .91$). Participants showed agreement to these statements ($M = 4.60$, $t(26) = 3.41$, $p < .002$, $r^2 = .31$, compared to the scale midpoint).

Procedure. At the store, participants were told that they would have one week to complete a scarf for a three-year old girl from a selection of yarn provided. After signing a consent form, they answered demographics questions, indicated their knitting level by ticking in front of a number of stitches listed (among which cables), whether they had ever knit a scarf, and whether they were color-blind. Color-blind participants were excluded from the study.

Next, participants were presented with a display of either a moderate (6) or relatively extensive (12) selection of yarn colors - we used a brand of wool of average quality and thickness. We selected the store’s 12 bestselling colors in that brand, out of 54 colors available. The 6 bestselling colors - bright blue, black, white, red, green and purple - were retained for the

moderate choice condition. Twelve colors were used in the extensive choice condition: brown, magenta, pale blue, baby pink, orange and yellow were added to the first six colors. In the moderate (extensive) choice condition, the skeins were presented on two rows of three (six), in a randomized order for each participant. Participants took as much time as they wanted to select their yarn colors. Once they made their choice, participants were told we had wound mini-skeins in each color, and only needed to know which 12 mini-skeins they wanted. This choice manipulation allows a conservative test of our hypotheses, since all choices available to participants exposed to limited choice (6,188 possible combinations of skeins) are also available to participants exposed to extensive choice (who face 1,352,078 possible combinations). Also, because the additional colors in the extensive conditions sell relatively less, they are likely to contribute to more novel outputs if picked, compared to the colors in the limited choice conditions. In sum, *ex ante*, our manipulation made it more likely that participants exposed to extensive choice would produce more original scarves.

The skeins were provided in a paper bag, along with identical needles for every participant, of the recommended size for that yarn. Each participant received 240 yards of yarn, which we had calibrated to be more than enough for a child's scarf. Participants were given instructions to be creative and utilize only the materials provided. In doing so, they were told that they neither had to use all the yarn provided, nor all the colors chosen, but only what they wanted to use. Participants were also asked to not talk about or show their project to anyone until the end of the study, and to not look at external sources (e.g., magazines or websites) for creative ideas. They also had to track the amount of time that they were actively working on their project, and come back the following week with their scarf, their needles, as well as all left-over yarn.

Before they left, participants were asked to report their current mood using a nine-point scale anchored at “-4” (I am in a very bad mood) and “+4” (I am in a very good mood), and were handed out a sheet summarizing the instructions they had just received.

A week later, participants returned their completed scarf and leftover material, and were handed out a paper-and-pencil questionnaire. Using seven-point scales (1-7), they reported how creative they thought their scarf was (not at all/very creative), and assessed how pleasant the creative process had been (not at all enjoyable/very enjoyable, very boring/very fun). Next, they answered an item about the weeklong creative process “Did the number of avenues possible in creating your design cause you some struggle?” (1 = not at all; 7 = very much so). Participants also reported the total time that they took to create the scarf and how much time they spent on the design alone. All participants confirmed that they had not been influenced by external sources, reported whether they knew the brand of yarn we used for the study, and if yes, how many colors were available in that brand. Participants were then debriefed, paid and thanked.

After all scarves were collected, two experts in creative knitting - both professionally involved in creative knitwear design – came in turn to our lab to evaluate the creativity of the scarves. They were first told that knitters had been asked to create a scarf for a three-year old girl in one week, and that their task was to assess the creativity of the scarves (randomized order) through handling and inspection (Burroughs and Mick 2004; Dahl and Moreau 2002; Goldenberg, Mazursky and Solomon 1999). All scarves were exposed on a large board, and experts were provided with a child mannequin head so they could see how the scarf looked when worn by a three-year old. They first reported their evaluation of each scarf on a 10-point scale (“not creative at all” (1)/“extremely creative” (10)). Next, again for each scarf, they reported their evaluation on specific dimensions of creativity. Using 10-point scales anchored at “not at

all” and “extremely,” they indicated the extent to which each scarf was original/novel/unique/useful/functional. After they had rated all the scarves, they indicated what percentage of their creativity judgment was driven by novelty versus appropriateness, the two subdimensions of creativity that are documented in prior research (Deci and Ryan 1987; Goldenberg, Mazursky, and Solomon 1999). They were then debriefed, paid (\$100) and thanked.

Results

Controls. A series of Choice x Knitting level ANOVAs using, as dependent variables: mood in the beginning of the study, the time taken to create the scarf, and the time taken for its design revealed no effects ($M_{\text{mood}} = 2.64$, $M_{\text{total time}} = 11.16$ hours, $M_{\text{design}} = 1.16$ hours, all p 's > .10). We also examined participants' awareness of how many colors were available in the yarn that we used in the study, since this could have influenced perceptions of selection choice. Only 14 knitters knew the yarn we used and results were not affected when we excluded those knitters.

Self-report of creativity. Focusing on knitters' self-report of creativity, a Choice x Knitting level ANOVA only revealed two main effects: one of Choice, such that knitters with extensive rather than moderate choice reported that their scarf was *more* creative ($M_{\text{moderate}} = 4.55$ vs. $M_{\text{extensive}} = 5.09$, $F(1, 72) = 4.19$, $p < .05$, $r^2 = .05$); and a main effect of Knitting level, such that experienced knitters reported that their scarf was more creative than inexperienced knitters ($M_{\text{experienced}} = 5.17$ vs. $M_{\text{inexperienced}} = 4.34$, $F(1, 72) = 10.23$, $p < .002$, $r^2 = .12$). Thus, in support of H1, more choice of inputs made knitters feel more creative (see Table 1).

Experts' creativity ratings. To test our key prediction that restricting choice can increase creativity, we averaged the knitting experts' creativity ratings ($r = .66$, $p < .01$) to form an

objective creativity index, which we subjected to a Choice x Knitting level ANOVA. We found a significant Choice x Knitting level interaction ($F(1, 72) = 7.75, p < .007, r^2 = .10$). In support of H2, scarves knit by experienced knitters under moderate rather than extensive choice were more creative ($M_{\text{moderate}} = 7.67$ vs. $M_{\text{extensive}} = 5.56, t(72) = 3.80, p < .001, r^2 = .17$, see Figure 1, Table 1). Scarves knit by inexperienced knitters were equally creative under moderate and extensive choice ($t < 1$). We also found a main effect of Knitting level, such that the scarves of experienced knitters were judged more creative than those of inexperienced knitters ($M_{\text{experienced}} = 6.74$ vs. $M_{\text{inexperienced}} = 4.60, F(1, 72) = 24.05, p < .007, r^2 = .25$). Finally, there was a main effect of Choice, such that the scarves knit under moderate rather than extensive choice were judged more creative ($M_{\text{moderate}} = 6.20$ vs. $M_{\text{extensive}} = 5.15, F(1, 72) = 5.71, p < .02, r^2 = .07$).

Insert Figure 1 and Table 1 about here

Knitters' enjoyment as mediator. After averaging the two measures of knitters' enjoyment during the process ($r = .29, p < .02$), we found that this enjoyment index mediated the experts' creativity ratings. In particular, we found that (1) the interaction of Choice and Knitting ability significantly influenced the experts' creativity index ($F(1, 72) = 7.75, p < .007, r^2 = .10$), (2) the Choice x Knitting ability interaction also influenced knitters' enjoyment during the creative process ($F(1, 71) = 4.80, p < .03, r^2 = .06$). Experienced knitters enjoyed the creative process more under moderate rather than extensive choice ($M_{\text{moderate}} = 5.90$ vs. $M_{\text{extensive}} = 5.11, t(71) = 2.71, p < .01, r^2 = .09$); inexperienced knitters equally enjoyed the process ($t < 1$, see Table 1). Finally, (3) in an ANCOVA with the experts' creativity index as the dependent variable and

knitters' enjoyment index as a covariate the Choice x Knitting ability interaction remained significant ($F(1, 70) = 4.40, p = .05, r^2 = .06$), but its effect was significantly attenuated (Sobel $z = 2.00, p < .05$). The knitters' enjoyment index, as a covariate, was significant ($F(1, 70) = 7.55, p < .008, r^2 = .10$), supporting our theorizing that knitters' enjoyment mediated the influence of choice on objective creativity (Baron and Kenny 1986).

Creativity subdimensions. To understand the nature of expert's creativity ratings, we subjected the five creativity subdimensions to a principal components analysis (using Varimax rotation) that revealed two components accounting for 97% of the variance. The first component was Novelty (original/novel/unique items, Cronbach- $\alpha = .73$, 57% of the variance), while the second captured Appropriateness (functional/useful items, $r = .96, p < .01$). These findings converge with research identifying novelty and appropriateness as the key components of a creative outcome (Deci and Ryan 1987; Goldenberg, Mazursky, and Solomon 1999).

A Choice x Knitting level ANOVA on the Novelty component only revealed a significant two-way interaction ($F(1, 71) = 4.12, p < .05, r^2 = .05$, see Table 1). As with the creativity item, we found that the scarves of experienced knitters were judged more original under moderate rather than extensive choice ($M_{\text{moderate}} = 5.50$ vs. $M_{\text{extensive}} = 4.45, t(72) = 3.80, p < .001, r^2 = .17$). Scarves knit by inexperienced knitters were evaluated as equally original under moderate and extensive choice ($M_{\text{moderate}} = 4.16$ vs. $M_{\text{extensive}} = 4.78, t(72) = 1.04, p > .30$). As with the creativity index, we found that the enjoyment index mediated the impact of Choice and Knitting level on the experts' evaluations of Novelty. Finally, a 2x2 ANOVA on the Appropriateness component only revealed a marginally significant two-way interaction ($F(1, 71) = 3.32, p < .08, r^2 = .04$, see Table 1). These findings converge with experts' report that Novelty accounted for a greater share of their judgment (60% and 70%) compared to Appropriateness (40% and 30%).

Struggle with creative possibilities. We proposed that moderate rather than extensive choice of creative inputs makes experienced consumers more effectively focus on a few rather than many creative paths. As a result, they should struggle less with creative possibilities. To examine this possibility, we subjected the item “Did the number of avenues possible in creating your design cause you some struggle” to a 2x2 ANOVA, which revealed a significant two-way interaction ($F(1, 62) = 3.82, p = .05, r^2 = .06$). Supportive of our conceptualization, experienced knitters who had been offered moderate choice reported struggling less than experienced knitters offered extensive choice ($M_{\text{experienced moderate}} = 3.00$ vs. $M_{\text{experienced extensive}} = 4.31, t(62) = 2.46, p < .02, r^2 = .09$). Inexperienced participants equally struggled ($t < 1$, see Table 1).

Color-related covariates. We also found that participants in the extensive choice conditions chose more colors than participants in the limited choice conditions ($M_{\text{colors moderate choice}} = 3.24$ vs. $M_{\text{colors extensive choice}} = 4.06, t(74) = 2.11, p < .04, r^2 = .06$). It is possible, then, that the creativity of the scarves resulted from the specific colors being combined rather than the amount of choice participants had. There are two ways that this could have occurred: first, the total number of colors chosen varying across conditions could explain the creativity ratings; a second possibility is that it is the number of *unique* colors chosen in the extensive conditions (i.e., the colors only available in these conditions) that is responsible for our creativity findings.

To examine these possible alternative explanations, we first ran analyses using knitters’ self-reported creativity rating as the dependent variable. A first Choice x Knitting level ANOVA used the number of colors chosen as a covariate, while a second used the number of colors uniquely chosen as a covariate. In both cases, the covariate was significant (both p ’s $< .02$). Most important, in both cases, the main effect of choice we previously observed was no longer significant (both p ’s $> .20$). This suggests that our knitters felt more creative (1) the more colors

they chose, and (2) the more unique colors they chose. In other words, the provision of choice gave knitters an illusion of creativity through the quantity and quality of colors they chose.

Did these covariates also explain our experts' creativity ratings? To examine this possibility, we ran two Choice x Knitting level ANCOVAs using experts' creativity ratings as the dependent variable. A first ANCOVA used the number of colors chosen as a covariate, and a second ANCOVA used the number of unique colors chosen as a covariate. In both cases, the Choice x Knitting level interaction remained significant (both p 's < .009), above and beyond the significant impact of each covariate (both p 's < .05). Thus, while the color mix of inputs chosen explained knitters' self-perceptions of creativity, it failed to fully account for experts' creativity ratings, that appeared to significantly result from the amount of choice knitters had.

Discussion. This field study provides a real-world setting in which we could conservatively test our predictions. A subtle manipulation – the provision of 6 versus 12 colors – had a significant influence on our knitters' post-choice creative experience. We found that, a week after they chose the yarn, knitters (regardless of their experience level) perceived their own creativity as greater when initially provided with an extensive rather than a moderate choice of yarn (H1). In contrast, the creativity of experienced knitters was rated as objectively greater when they were provided with moderate rather than extensive choice, while the amount of choice did not affect the creativity of inexperienced knitters (H2). Finally, we found that the enjoyment of the weeklong creative process caused the actual creativity results we observed (H3).

The enjoyment of a creative process is a multi-dimensional experience (Henderson 2004). To illustrate, distinct sources of enjoyment include the affective pleasure in the creative challenge, the pleasure in self-expression, the ability to focus on creative solutions or the pleasure in problem-solving (Russ 1993, 1999). In our conceptualization of how the provision of

choice influences creativity, we proposed that it is specifically creators' ability to focus that is conducive to greater task enjoyment when creators are presented with a restricted choice of creative inputs. In turn, this greater enjoyment transcends into more creative outcomes. We directly tested this proposed mechanism in a second study we present next.

EXPERIMENT 2: A STUDY IN MAKING CHRISTMAS TREE ORNAMENTS

Recall that choice overload research suggests that restricting choice should prevent stress and anxiety (e.g., Csikszentmihalyi 1990), thereby positively influencing creators' enjoyment of the creative process. We further suggested that restricting choice also enhances creators' ability to focus on promising creative paths, and more fully develop those. If it is creators' ability to focus that drives the enjoyment and subsequent creativity results we observed in the knitting study, then compromising this ability to focus should eliminate the mediating influence of enjoyment of the creative process on actual creativity, independent of the amount of choice provided to creators.

To test this prediction, we recruited creators experienced in making crafts, from craft stores offering advanced classes in preparation for the upcoming Holidays, as well as from our University pool. We asked these experienced crafters to create a Christmas tree ornament after choosing from a moderate or an extensive choice of shapes they could use as creative components. Orthogonally to this choice manipulation, creators were required to either rehearse a two-digit or an eight-digit number as they were creating their ornament, following an established manipulation of cognitive busyness (Gilbert and Osborne 1989). We predicted that participants rehearsing a two-digit number - an effortless task - would enjoy the creative process

more when provided with a moderate rather than an extensive choice of shapes, which should transcend into more creative ornaments. In contrast, participants rehearsing an eight-digit number would be cognitively busy and should generally find it relatively difficult to focus during the creative task. If restricting choice should make them generally enjoy the process more, this enjoyment should no longer translate into more creative outcomes when their ability to focus is simultaneously compromised. In sum, we predicted that cognitive busyness (not busy vs. busy) moderates the mediating influence of enjoyment of the creative process on actual creativity.

Another purpose of this follow-up study was to fully randomize the creative inputs provided in the moderate choice conditions, as a potential issue in the knitting study is that our findings may have resulted from the average quality in the moderate assortment being perceived as greater than in the large assortment, rather than from the provision of choice per se.

Method

Overview. The study was a 2 (Choice: moderate vs. extensive) x 2 (Cognitive busyness: not-busy vs. busy) between-subjects design. N = 59 experienced crafters (13 men, 46 women, age = 21.2 years) participated in return for \$8. The study was presented as an investigation of creativity requiring participants to draw a Christmas tree ornament. All crafters had a degree in applied arts (e.g., sculpture, ceramics), had recently taken classes in crafts (e.g., class on gift-wrapping), or were continuously involved in a crafts project (e.g., making crafts with kids).

Procedure. In the lab, participants were told that they would be requested to create a Christmas tree ornament using a selection of shapes provided as components for their ornament. After signing a consent form, participants filled out a 13-item “crafts scale” that we developed to

further check their experience in making crafts (e.g., “In my spare time, I look to work on crafts projects,” or “I always have a craft project under way,” seven-point scales anchored at “completely disagree”/“completely agree”).

Next, participants were told that they were going to work on a creative task and that, in addition, the experimenter was interested in learning how well people can perform two dissimilar tasks simultaneously, and that they would therefore be required to rehearse either a 2-digit number (not-busy conditions) or an 8-digit number (busy conditions) while working on the creative task (Gilbert and Osborne 1989). All participants were given 25 seconds prior to receiving the creative task instructions to memorize their assigned number, and were instructed to hold the number in memory until the experimenter later asked them to recall it.

Then, the experimenter instructed participants to express their creativity to the best of their ability as they drew a Christmas tree ornament from a selection of shapes that we provided. This task was adapted from prior creativity research (e.g., Dahl and Moreau 2007; Finke et al. 1992) to fit the purpose of our study. In particular, we manipulated the number of shapes that participants could use as components for their ornament. Half of the participants were given six shapes – randomized for each participant (moderate choice conditions), while the other half of participants was given all 20 shapes (extensive choice conditions, see Appendix). All participants were told that they could use all of the shapes or only some of them, and that they could use a given shape as many times as they wanted. They were given drawing paper and a pen, and told that they had 10 minutes to work on the task.

After 10 minutes, the experimenter collected the drawings and gave participants a paper-and-pencil questionnaire. Participants first reported the number they had been asked to rehearse. Then, they reported, using 7-point scales anchored at “1” (not at all) and “7” (very) the extent to

which they found the creative process “not at all / very enjoyable” and “very boring/ very much fun” ($r = .46, p < .001$), and the time they spent thinking about the ornament before they started drawing it. They also listed what aspects of their ornament made it interesting, answered six items capturing their attitude towards Christmas (e.g., “I love Christmas” or “Regardless of religion, I enjoy the Christmas spirit”), and reported their religion, ethnicity, gender and age. Finally, participants were fully debriefed, paid and thanked.

Next, we invited another 10 experienced crafters to our lab to evaluate the creativity of the ornaments (Dahl, Chattopadhyay, and Gorn 1999; Olney, Holbrook, and Batra 1991). These peers were told that crafters had been asked to create a Christmas tree ornament from a number of shapes provided and were briefly shown the page containing all 20 shapes. They were further told that their task was to assess the creativity of the ornaments (randomized order). All drawings were exposed on a large board, along with crafters’ list of the aspects making their ornament interesting. Using a booklet we provided, peers reported their evaluation of each ornament on a 7-point scale ranging from “not at all” to “extremely creative / original / inspired / artistic / innovative / resourceful / clever / useful”. Then, they indicated what share of their judgment was driven by novelty versus appropriateness. They were then debriefed, paid (\$15) and thanked.

Results

Controls and checks. A Principal Components Analysis of the crafts scale items revealed three components of participants’ experience; for all three components, creators’ average score was significantly greater than the middle of the scale (all p ’s $< .005$), thereby confirming that our participants’ selection was effective with respect to experience in making crafts. Also, a series of

ANCOVAs showed that creators' attitude toward Christmas, religion, ethnicity, gender and age showed no impact of these variables, and they are therefore not discussed further.

Peers' creativity ratings. After averaging peers' "creative" item ($\alpha = .89$), we ran a Choice x Cognitive busyness ANOVA using this creativity index as the dependent variable. It only revealed a significant two-way interaction ($F(1, 55) = 9.22, p < .02, r^2 = .14$). As we predicted, the tree ornaments of not-busy participants with limited choice were rated as significantly more creative compared to the ornaments of busy participants with limited choice ($M_{\text{limited not-busy}} = 5.18$ vs. $M_{\text{limited busy}} = 3.93, t(55) = 2.76, p < .008, r^2 = .12$), and participants with extensive choice (whether busy or not busy) ($M_{\text{extensive not-busy}} = 3.98, t(55) = 2.73, p < .008, r^2 = .12$; $M_{\text{extensive busy}} = 4.32, t(55) = 1.79, p < .05$, one tail – see Table 2).

Insert Table 2 about here

Crafters' enjoyment as moderated mediator. After averaging the two enjoyment items, we ran a Choice x Cognitive Busyness ANOVA on the resulting enjoyment index. This analysis revealed a main effect of Choice, such that participants with moderate choice enjoyed the creative process more than participants with extensive choice ($M_{\text{moderate}} = 5.13$ vs. $M_{\text{extensive}} = 4.43, F(1, 55) = 5.34, p < .03, r^2 = .09$). It also revealed a main effect of Cognitive Busyness, such that crafters who rehearsed two digits enjoyed the creative process more than crafters who rehearsed eight digits ($M_{\text{2-digits}} = 5.08$ vs. $M_{\text{8-digits}} = 4.44, F(1, 55) = 4.70, p < .04, r^2 = .08$).

We predicted that the mediating role of crafters' enjoyment of the creative process would be moderated by whether crafters would be cognitively busy or not. That is, we hypothesized that the impact of Choice on creativity is mediated by enjoyment of the creative task, but only when crafters were not cognitively busy. When crafters were cognitively busy, we expected their ability to focus to be compromised, which would prevent enjoyment of the creative task to transcend into more creative ornaments. We tested this moderated mediation following Preacher, Rucker and Hayes (2007, model 2). As predicted, the Choice x Digit interaction in the mediator model was significant ($t(55) = 2.20, p < .04, r^2 = .08$). In particular, the conditional indirect effect of choice on enjoyment of the creative task was significant when crafters were not cognitively busy ($z > -1.94, p = .05$). In contrast, when crafters were cognitively busy, the indirect effect of choice on enjoyment was not significant ($z = -.84, p > .40$). Thus, the results suggest that it is indeed creators' ability to focus that drives the enjoyment that eventually boosts the actual creativity of the ornaments.¹

Creativity subdimensions. The inter-rater reliability for each of the seven creativity subdimensions ranged between .74 and .90. A principal components analysis (using Varimax rotation) revealed that the subdimensions loaded on two components accounting for 61% of the variance. A Novelty component (original/inspired/artistic/innovative, $\alpha = .96$, 37.4% of the variance) and an Appropriateness component (clever/resourceful/useful, $\alpha = .90$, 23.4% of the variance) was identified. A Choice x Cognitive busyness ANOVA on the Novelty component revealed a significant two-way interaction ($F(1,55) = 4.68, p < .04, r^2 = .08$), such that the

¹ Complementing these enjoyment results, we note that participants also filled out the negative items from the Positive Affect Negative Affect Schedule (Watson, Clark and Tellegen 1988). A 2x2 ANOVA using the averaged negative items as the dependent variable ($\alpha = .78$) revealed a significant two-way interaction, $F(1, 55) = 4.10, p < .05, r^2 = .07$. We found that not-busy participants with limited choice experienced less negative affect over the creative process, compared with participants in each of the other three conditions, all p 's $< .05$.

ornaments of not-busy participants with limited choice were judged more novel than ornaments in each of the other conditions ($M_{\text{limited not-busy}} = 5.04$ vs. $M_{\text{all others}} = 3.83$, all p 's $< .008$). There was no difference in Novelty in the other three conditions (all p 's $> .80$). We found marginal support for the moderated mediation of enjoyment on creativity when crafters were not busy ($z > 1.87$, $p < .06$), but not when they were ($z = -0.83$, $p > .40$). Finally, a 2x2 ANOVA on the Appropriateness component only revealed a marginally significant two-way interaction ($F(1, 55) = 3.13$, $p < .09$, $r^2 = .05$, see Table 2). These findings converge with what peers reported was driving their judgments: all but one peer rater reported giving more weight to Novelty (63.5% on average) than Appropriateness (36.5% on average).

GENERAL DISCUSSION

Our findings reveal that restricted choice increases enjoyment and objective creativity for experienced consumers, but generally decreases subjective creativity ratings made by consumers. Indeed, consumers that have a strong base of experience in a creative task seem to enjoy the task far more when they have a constrained choice of inputs. This enjoyment is shown to translate into more creative outcomes, but just for experienced consumers. Our data further suggests that it is the difficulty consumers have to focus when choosing among extensive creative input options that drives this effect. Anxiety and potential decision paralysis (Schwartz 2004) over creative inputs likely results in less focus and reduced task enjoyment, which has negative implications for the creative outcomes produced by consumers. This pattern of effects is not realized for inexperienced consumers who lack domain-relevant knowledge and ability and thus are unlikely to be sensitive to change in the input choice set. Interestingly, choice gives consumers the

illusion that an extensive selection of creative inputs will make them more creative. This illusion seems to result from consumers sampling more inputs, as well as seemingly more unique inputs. The juxtaposition of the knitting experts' and the knitters' creativity ratings we observed in our field study creates a conflict as reducing choice to a moderate level appears to enhance creative output, but it remains likely that an experienced creator would seek out the largest choice set available. In general, we believe the phenomenon identified in our research has seeded opportunities for future investigation.

Choice overload effects and consumers' decision process. Our findings reveal a new type of choice overload effect, one durably affecting the experience of creativity beyond choice. In particular, our field study on recreational knitting involved measures capturing both the choice experience as well as the weeklong creative experience. As suggested by Scheibehenne, Greifeneder and Todd's (2010) meta-analysis, there may be limited support for choice overload effects at the time of choice or right after it. However, their meta-analysis averaged findings in prior research across different levels of moderating variables, including expertise (Chernev, Böckenholt, and Goodman 2010). Further, we find that choice may hamper other aspects of consumption than those considered in the meta-analysis, such as creative consumption experiences, as we demonstrate in the ecological setting that our field study provides. While prior research found that more choice benefits (e.g., Chernev 2003b) or does not affect experienced consumers (e.g., Mogilner, Rudnick, and Iyengar 2008), we find that more choice hurts experienced consumers. We argue that the reason for these seemingly discrepant results is due to the unique nature of creativity as a dependent variable: because considerable cognitive processing occurs between choice and the creative output, the influence of choice on that processing directly impacts the quality of the output. Unlike consumption outcomes in these

prior works (e.g., satisfaction with a chosen magazine), creative outcomes are typically not well-defined a priori (Guilford 1950; Newell and Simon 1972), making experienced consumers unable to know exactly what creative inputs will make them most creative ex ante. In other words, consumers' ideal combination of inputs is typically not available at the time of choice, consistent with prior theorizing (Chernev 2003b).

The illusion of choice. We find that consumers perceive the opposite of choice overload when asked about their own creativity. How does choice impact creator's self-perception of creativity? In our study, knitters with extensive choice sampled more different and unique inputs compared to knitters with moderate choice, which seemingly drove their self-perception of creativity. It may be that as choice of color increases, knitters tend to more heavily rely on this basic perceptual attribute when developing their creative solution. This would explain why knitters chose more colors when they were provided extensive rather than moderate choice. Generally, it may be that whatever attributes cause the most variance in the choice set – whether color, texture, or size – push creators to rely on it heuristically more, the more choice they have. At the end of the study, we also asked participants how satisfied they were with their choice of colors right after choice. We found that knitters with extensive choice were more satisfied than knitters with moderate choice. While this satisfaction rating failed to mediate knitters' creativity ratings, it remains possible that creative consumers confound experiences of pleasure in the selection of creative output with creative experiences. A related possibility is that creators' intuitive confidence in the creative quality of their choice increases with choice, which in turn may bias their self-perception of creativity (Simmons and Nelson 2006). These possibilities provide opportunities for future research.

Substantive implications. Should consumers be encouraged to correct their own assessment of creativity (see Hoch and Deighton 1989 for possible strategies)? Our findings suggest this would be of limited interest when creators are also the end-consumers of the creative output. However, in some instances there may be good reason to shatter the illusion – i.e., in the context of public policy, where governments are concerned with the greater good, the need for objective creativity may be paramount. For example, governments looking to spur green consumer behavior by making consumers more creative in their use of products may want to limit choice in the first place. Examining, for example, the effects of limiting the number of cell phone options consumers consider prior to adopting a given phone would be interesting. How does limiting choice affect how creatively they will use the phone's features? Another context where our findings are relevant is when the creator is not the one benefitting from the creative outcome. Indeed, a practitioner managing a team of creative designers working on developing new products may want to make them aware of the actual impact of choice of inputs on their creativity. In sum, our findings have practical relevance whenever consumers' collective interest compensates for the unfortunate collateral damage of potentially hurting the creators' ego.

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TABLE 1. MEANS (AND SDS) OF KEY DEPENDENT VARIABLES
FOR KNITTERS' AND KNITTING EXPERTS

	Knitters	Knitting experts
Creativity ratings		
Moderate choice		
Inexperienced	4.16 (1.07)	4.53 (1.61)
Experienced	4.87 (.87)	7.67 (1.44)
Extensive choice		
Inexperienced	4.56 (1.63)	4.69 (1.05)
Experienced	5.56 (1.04)	5.56 (2.63)
Novelty dimension		
Moderate choice		
Inexperienced		4.16 (1.31)
Experienced		5.50 (2.06)
Extensive choice		
Inexperienced		4.78 (1.11)
Experienced		4.45 (2.22)
Appropriateness dimension		
Moderate choice		
Inexperienced		4.87 (1.58)
Experienced		5.78 (1.40)
Extensive choice		
Inexperienced		5.89 (.80)
Experienced		5.65 (1.44)
Process enjoyment		
Moderate choice		
Inexperienced	5.29 (.80)	
Experienced	5.91 (.72)	
Extensive choice		
Inexperienced	5.44 (1.12)	
Experienced	5.11 (1.08)	
Struggle with creative possibilities		
Moderate choice		
Inexperienced	3.00 (1.33)	
Experienced	3.00 (1.25)	
Extensive choice		
Inexperienced	2.88 (1.59)	
Experienced	4.31 (1.74)	

TABLE 2. MEANS (AND SDS) OF KEY DEPENDENT VARIABLES FOR CRAFTERS AND
PEER CRAFTERS IN THE CHRISTMAS CRAFTS STUDY

	Crafters	Peer crafters
Creativity ratings		
Moderate choice		
Not-busy		5.18 (.92)
Busy		3.93 (1.44)
Extensive choice		
Not-busy		3.98 (1.28)
Busy		4.32 (1.28)
Novelty dimension		
Moderate choice		
Not-busy		5.04 (.82)
Busy		3.78 (1.37)
Extensive choice		
Not-busy		3.85 (1.14)
Busy		3.86 (1.07)
Appropriateness dimension		
Moderate choice		
Not-busy		4.62 (.76)
Busy		3.56 (1.27)
Extensive choice		
Not-busy		3.73 (.89)
Busy		3.49 (.66)
Process enjoyment		
Moderate choice		
Not-busy	5.63 (1.00)	
Busy	4.63 (1.44)	
Extensive choice		
Not-busy	4.59 (1.00)	
Busy	4.21 (1.39)	

FIGURE 1 A. SELECTED EXAMPLES OF CREATIVE SCARVES KNIT BY
EXPERIENCED KNITTERS EXPOSED TO A MODERATE CHOICE OF INPUTS.



FIGURE 1B. SELECTED EXAMPLES OF LESS CREATIVE SCARVES BY EXPERIENCED KNITTERS EXPOSED TO A RELATIVELY EXTENSIVE CHOICE OF INPUTS.



APPENDIX. SHAPES USED IN THE CHRISTMAS TREE STUDY

