THE EFFECTS OF CHANCE AND ROMANTIC MOTIVES ON CONSUMER

PREFERENCES

by

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and approved by

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ABSTRACT OF THE DISSERTATION

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My dissertation advances our understandings about how chance and romantic motives influence consumer behavior.

The first essay examines why chance events are often perceived more favorably and how such events impact the consumer experience. A series of studies demonstrate that consumers come to infer a stronger link between a chance event and their own self-concept. This increased self-product connection occurs as a means to restore a sense of control over chance events. This effect occurs regardless of limited mental resources, suggesting that the proposed effect is not due to increased elaboration during chance encounters. Consistent with the conceptualization, this effect is attenuated when control is restored, when the product has a negative valence, and when consumers are led to

focus on others and not the self. This research is the first to examine the hidden factors that lead chance to become associated with good fortune.

The second essay considers whether romantic pair-bond motivations influence numerical preferences. Across cultures and throughout history, the number "2" has been symbolic of a romantic pair bond. I propose that reminders of romance should lead people to prefer the number "2" and associated even numbers. A series of studies demonstrate that romantic motives – goals related to forming a romantic pair-bond – increase preference for the number "2" and other numbers of its parity (i.e., even vs. odd numbers) and marketing stimuli featuring even (vs. odd) numbers. This effect is specific to romantic motives and does not occur for other relationship motives such as those related to work relationship, kinship, and friendship. Consistent with a motivational perspective, the desire to form a romantic relationship statistically mediated the effect of romantic cues on preference for even numbers. Subsequently, the effect of romantic motives on preference for even numbers is suppressed when mating goals are easy to achieve or a committed romantic pair-bond (with one partner) is not important.

Across two essays, my dissertation provides novel insight into the hidden influences of chance and romantic motives on the consumer experience. This work has important implications for consumers, marketers, and researchers. Namely, the conceptual underpinning advanced in both essays provides a richer understanding of two unknown, persistent biases in consumer behavior. Insights from this work can help consumers and

marketers design optimal decision environments to enhance enjoyment and find work-arounds for biases in preferences, as well as advance future research.

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Essay I: Finding the Self in Chance Events

INSTRUCTION

Happenstance is an event that occurs by chance (Dictionary, Merriam-Webster 2002). Historians and philosophers have noted that instances of happenstance can sometimes enhance positive evaluations, whereby the experience of chance becomes labeled as serendipity (Merton and Barber 2004; Van Andel 1994). For example, serendipity is often thought to be the driving force that brings together two soul mates, as depicted in the 2001 movie by the same name starring John Cusack and Kate Beckinsale: the two main characters meet at a department store, share an ice cream, exchange goodbyes, each soon discovers that they have left a personal item at the ice cream shop, and return only to meet each other again. This chance reunion deepens their attraction and they make plans to spend an evening together. Enhanced pleasure from chance events is not saved for igniting true love, but can also occur in ordinary experiences such as the chance rotation of a song on the radio (Leong, Howard, and Vetere 2008), yet we know very little about why and when chance enhances the consumer experience. The current research investigates what makes (some) chance events more favorable.

To begin, consider two consumer scenarios. In one scenario a consumer visits a music store and hears *Call Me Maybe* (by Carly Rae Jepsen). In the other scenario a consumer visits the post office and hears *Call Me Maybe*. The current research predicts that the higher degree of chance associated with hearing the pop song at the post office (compared to the music store) leads consumers to impute a stronger connection between themselves and the product (in this case, the song). This may occur because when an event is less predictable—like a chance reunion at an ice cream shop or simply hearing a pop song at the post office—consumers resolve the unpredictability and lack of control

by ascribing greater meaning to the encounter in the form of perceptions that the product is strongly connected to the self.

When I asked over 200 people to write about either a recent serendipitous experience versus a mere positive one, the chance experience was described using significantly more self-referent words ("I," "me," "my," or "mine") compared to the positive experience, hinting at the possibility that people indeed infer a stronger self-product connection to chance events. I conjecture that it is this connection to the self that gives rise to enhanced pleasure from happenstance[1].

The prediction that chance should beget a stronger connection to a consumer's self-concept is not altogether straightforward. Returning to the consumer scenarios described above, because one of the consumers made a point to visit a music store (where songs are often played), one prediction is this experience would foster a stronger connection. This would be consistent with research that shows that a predictive context leads to positive evaluations (Lee and Labroo 2004; Reber, Winkielman, and Schwarz 1998; Winkielman and Cacioppo 2001). However, previous work has also found that unpredictability can lead to an attempt to re-establish a sense of predictability and control over the environment (Burger and Hemans 1988; Heine, Proulx, and Vohs 2006; Pittman and Pittman 1980; Whitson and Galinsky 2008). This is important because consumers

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[1] In the current research we use the word chance to describe an event that is unexpected. Although we use the term chance for the purpose of simplicity, we acknowledge that this concept is similar to the notion of surprise. The current research does not seek to disentangle happenstance from associated concepts that have been used to describe it (e.g., surprise), but rather examine why some chance events—including those that come to be labeled as pleasantly surprising—are perceived more positively compared to the same event encountered in a predictable context.

who feel low control search for opportunities to restore control (Cutright 2012; Cutright and Samper 2014; Hamerman and Johar 2013). One way for people to re-establish predictability and a sense of control is to infer that they are interacting with an object that has a strong connection to the self (Kray et al. 2010; Lecky 1945; Rosenberg 1986).

Thus, I propose that consumers restore a sense of order from chance events by imputing a stronger connection between themselves and the product. Although previous work has found that moderate product-attribute incongruity, such as a new color on a product label, leads to greater elaboration that engenders favorable evaluations (Clemente, Dolansky, Mantonakis, and White 2013, Mandler 1982; Meyers-Levy and Tybout 1989; Peracchio and Tybout 1996), I propose that the predicted effect is distinct from moderate incongruity. That is, chance, and not product-attribute incongruity or increased elaboration, strengthens the self-product connection via consumers' desire to restore control. I investigate this prediction in five studies.

CONCEPTUAL DEVELOPMENT

Chance and Perceived Control

Although happenstance has been described in various ways and portrayed in popular media as serendipity, perceptions of chance events have received little empirical attention. Some research has found that people perceive an event to be more meaningful and beneficial when they are led to believe that the event occurred due to chance (Kray et al. 2010). People also attributed greater meaning to thoughts resulting from spontaneous processes (i.e., a thought that comes to mind without cause) compared to thoughts resulting from more deliberate processes, and even feel more sexually attracted to an

attractive person whom they thought of spontaneously rather than deliberately (Morewedge, Giblin, and Norton 2014). In terms of consumer experiences, unexpected or surprise incentives (e.g., coupons) are viewed more positively and lead to increased spending on unplanned purchases (Heilman, Nakamoto, and Rao 2002; Valenzuela, Mellers, and Strebel 2010), and consumers report greater attitudes toward randomly distributed products compared to when the same products are deliberately selected (Botti and McGill 2006; Iyengar and Lepper 1999; Redden, Haws, and Chen 2017). Although limited, this suggests that products can be evaluated more favorably when the consumption experience occurs by chance. But, why would unexpected or chance experiences come to be more pleasurable?

I propose that one answer to this question lies in the lowered perceptions of control that arise during chance encounters. When an event occurs by chance, the outcome is less predictable and, thus, chance events are associated with a perceived lack of control over the current environment and the outcome of one's actions (Kay et al. 2008; Kray et al. 2010). If chance encounters lead to lowered perceptions of control, people may seek to restore control by means of finding an alternative connection the target or event encountered (Loffing, Stern, and Hagmann 2015; Meyers-Levy and Tybout 1989; Peracchio and Tybout 1996). Previous research hints at this possibility. People expect outcomes to be connected to previous actions (Aronson 2008; Cialdini and Trost 1998; Hollander 1958; Schachter 1951; Schultz et al. 2007) and often go to great lengths to re-establish predictability and sense of control when outcomes are unanticipated (Cutright 2012; Whitson and Galinsky 2008). For example, when people encounter an unfamiliar object, they attempt to draw an association between the

encountered object and something known (i.e., an existing schema). Further, when people view irregular arrays or consider random phenomena, they seek out an illusory pattern to establish a sense of meaning (Burger and Hemans 1988; Pittman and Pittman 1980; Whitson and Galinsky 2008). Because chance encounters are often perceived more favorably (Heilman et al. 2002; Valenzuela et al. 2010; Wilson et al. 2005), it is possible that enhanced perceptions arise because a lack of control or predictability leads people to draw a stronger connection between themselves and the chance event.

Restoring Control through Self Connection

Given that people use the self-concept as a "master motive" that regulates and maintains consistency in their thoughts and ideas (Lecky 1945), one way people restore control and maintain predictability is to infer that they are interacting with an object or a person that is consistent with their self-concept (Madon et al. 2001; Swann and Read 1981; Swann, Stein-Seroussi, and Giesler 1992). Previous research has shown that interaction with an object or event can foster a self-connection because people experience a shift in self-concept and come to see themselves as more aligned with an object in order to maintain consistency between past and future actions (Aronson 1968; Bem 1972; Burger 1999; Festinger 1957; Heider 1958; Heine et al. 2006). Perceiving a stronger connection between the self and things in one's environment fosters feelings of predictability that one's actions can lead to a controllable outcome (Hohenstein et al. 2007; Langer 1975; Swann and Read 1981). Thus, chance encounters may lead consumers to ascribe a stronger connection between the product and the self because doing so allows consumers to re-establish a sense of order or control. According to the

theorizing, it is the enhanced connection to the self that is the hidden link that imbues chance with enhanced product experience.

When consumers feel connected to a specific product or brand, this leads to enhanced motivations to consume the product as a way to bolster the self-concept (Berger and Ward 2010; Birdwell 1968; Gao, Wheeler, and Shiv 2008; Weiss and Johar 2013; White and Argo 2009). Research has found that consumers are more attracted to and seek out products that are aligned with their self-concept (Berger and Health 2007; Ward and Broniarczyk 2011), and become more attached to self-consistent products (Ball and Tasaki 1992). Recently, it has been shown that consumers satiate more slowly to products that are consistent with a currently active self-identity (Chugani, Irwin, and Redden 2015). Taken together, this work suggests positive product evaluations arise when a product is more strongly connected to the self-concept. While the effect should occur for positive, and even trivial, events, I propose that it will reverse for negative experiences.

A large body of research has found that people bask in reflected glory and cut themselves off from reflected failure (e.g., Boen et al. 2002; Cialdini, Borden, Thorne, Walker, Freeman, and Sloan 1976; Snyder, Lassegard, and Ford 1986). That is, when something good happens, people associate themselves with the event. But, when something bad happens, people prefer to distance themselves from the event. In a classic study by Cialdini and colleagues (1976), university students were more likely to be wearing their university sweatshirts on the Monday following the football team's win over the weekend compared to when the team lost. Therefore, chance encounters should follow a similar path, whereby positive or neutral experiences become strongly associated

with the self and negative chance experiences are distanced from the self. In other words, no self-connection should arise when the chance event is negative.

RESEARCH OVERVIEW

I support the predictions in five studies. Study 1 shows that chance leads to enhanced self-product connection and that this effect is not due to differences in elaboration between high versus low chance conditions. Study 2 shows that chance leads to enhanced self-product connection via a desire to restore control**.** Studies 3 provide additional support for the conceptualization, showing that chance does not lead to enhanced self-product connection when control is restored immediately before the chance event occur. Finally, studies 4 and 5 examine important boundary conditions of the effect. The effect of chance on self-product connection is weakened when the product has a negative valence and when consumers are led to focus on others and not the self.

STUDY 1: FINDING THE SELF UNDER LIMITED MENTAL RESOURCES

Study 1 sought to examine the relationship between a chance consumption event and perceptions of self-product connection using a guided visualization. I have proposed that this effect occurs when a product experience is associated with a higher degree of chance. Consistent with previous work on perceptually predictive contexts (Fischhoff 1975; Lee and Labroo 2004; Whittlesea 1993), study 1 manipulated perceived chance by altering the relevance of serial situations in a consumption context. Specifically, participants imagined themselves in a hypothetical consumption scenario that involved an event that was more or less relevant to the proceeding situation. I propose that when a

product outcome is semantically less predictive from the preceding situation (e.g., entering a post office and hearing a song), consumers should find stronger self-song connection.

Study 1 also sought to test several important alternative accounts. Perceptions of a product might be changed because expectancy violations can increase elaboration to resolve the discrepancy (Meyers-Levy and Tybout 1989; Priester et al. 2004). Given that processing information about the self is more familiar and easily accessible in memory than any other information (Bower and Gilligan 1979; Markus 1977; Rogers, Kuiper, and Kirker 1977), I predicted that the effect of chance on self-product connection is not due to elaboration. To test this, study 1 examined whether the predicted effect is mitigated when participants are under cognitive load (i.e., have limited mental resources). If the effect is weakened under load, then this is evidence that the proposed effect may be due to increased elaboration that results when events are unexpected. However, if the effect remains, this would be further support that the proposed effect is related to the self-product connection that arises during chance product encounters. Because divergence from typicality can increase perceived novelty (Hekkert, Snelders, and Van Wieringen 2003), which may lead to an incongruent product being perceived more favorably when it is first introduced (Meyers-Levy and Tybout 1989; Peracchio and Tybout 1996; Stayman, Alden, and Smith 1992), the current study included a familiar song (*Call Me Maybe* by Carly Rae Jepsen) to explore whether this effect emerges regardless of marketplace novelty.

Method

Participants. Study 1 had 158 undergraduate participants who were recruited in return for course credit. To rule out the concerns that this effect occurs because the cognitive load manipulation itself reduced participants' attention to the focal task (hearing a song), I excluded participants who failed the attention check or skipped hearing the clip. Finally, 103 participants were included in the analysis (44 men; 18 to 45 years; $M = 21.12$, $SD = 3.83$). The study had a 2 (cognitive load: low vs. high) $\times$ 2 (chance: high vs. low) between-subjects design.

Procedure. Participants were randomly assigned to one of the two cognitive load conditions. Participants in the low cognitive load conditions were asked to memorize the location of a series of Xs that were placed in a diagonal pattern and asked to remember which cells had an "X" in them because they would be asked to recreate the table later. Participants in the high cognitive load conditions were asked to memorize the location of a series of Xs that were placed in an irregular array and asked to remember which cells had an "X" in them because they would recreate the table later. The irregular nature of the high load memorization task makes it more difficult to recall and constrains cognitive resources available for subsequent tasks (Logie, Zucco, and Baddeley 1990; see fig. 1).

FIGURE 1: STUDY 1 ENGAGEMENT MANIPULATION

Low Load   High Load

After the cognitive load manipulation, participants were thanked and asked to click on an arrow as they would now move to a different study. Participants were then randomly assigned to one of the two chance conditions. The chance manipulation was a guided visualization similar to that used in study 1 and again involved hearing a song. Specifically, participants were asked to imagine that they were visiting a record shop (high chance) or a bank office (low chance) and were asked to write a few sentences about how they envision the situation and how they would feel. Afterwards, they were asked to imagine that the clerk plays a song while they are in the record store (bank office) and a song familiar to the US sample (*Call Me Maybe* by Carly Rae Jepsen from the US pop charts) was played with the participants listening on individual headsets. After hearing the song, participants responded to items that more directly measure perceptions of self-product connection: "When you heard the song, did you find something connected / relevant to yourself?" (1 = *Not At All*, 9 = *Very Much*, α = .89). Participants also reported the question that measure perceived chance: "To what extent did you feel hearing a song was predicted by visiting a record shop (clothing store, post office)?" (1 = *Not At All*, 7 = *Very Much*). Finally, participants were asked "How hard was the memory test (recalling where the cells were that had the X)?" (1 = *Not At All*, 5 = *Very Much*). Elaboration was recorded as time spent envisioning the situation.

Results

Manipulation Checks. An ANOVA revealed only a significant effect of chance. Participants felt the consumption experience was less predicted in the low chance (*M* = 2.00, *SD* = 1.31) compared to the high chance condition (*M* = 4.96, *SD* = 1.89); $F(1, 84)$ = 64.13, $p < .001$; occasional missing values affected the degrees of freedom); neither the

main effect of cognitive load nor chance by cognitive load interaction was significant (*Fs* < 1). As expected, there was only a main effect of cognitive load condition on perceived difficulty, such that participants felt the memory test was more difficult in the high load (*M* = 2.34, *SD* = 1.34) compared to the low load condition (*M* = 1.03, *SD* = .17; F(1, 85) = 32.15, *p* < .001).

Self-Product Connection. An ANOVA showed a main effect of chance (*F*(1, 99) = 4.43, *p* < .04, see fig. 2) such that participants reported a stronger connection to the product in the low chance (*M* = 4.00, *SD* = 2.61) compared to the high chance condition (*M* = 2.97, *SD* = 2.26). However, neither a main effect of cognitive load nor the interaction between chance and cognitive load was significant (*ps* > .26).

FIGURE 2: THE EFFECT OF CHANCE AND COGNITIVE LOAD ON SELF-PRODUCT CONNECTION (STUDY 1)
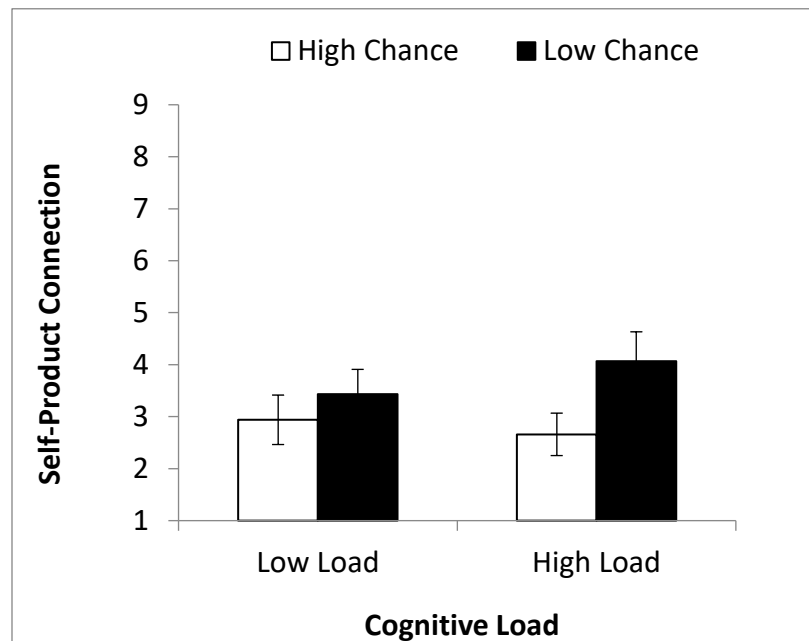
Discussion

Study 1 found that a product experience that occurs by chance led to an increase in self-product connection. Participants reported a stronger self-product connection in the low versus high chance conditions. The proposed effect held regardless of whether mental resources were limited, suggesting that increase elaboration does not underly the effect of chance on self-product connection. The following series of studies provides additional evidence for the effect of perceived chance on self-product connection and its underlying process while ruling out alternative accounts.

STUDY 2: THE MEDIATING ROLE OF PERCEIVED CONTROL

Study 2 sought to replicate the previous findings and further demonstrate the generalizability of this phenomenon, using a different operationalization of chance events. Instead of varying the relevance of serial situations, study 2 directly manipulated perceived chance of events (Wakslak et al. 2006). Specifically, participants imagined themselves in a hypothetical consumption scenario that involved an event that was more or less likely to occur. I propose that when a product outcome is unlikely to occurs (e.g., 5% chance), consumers should find stronger self-song connection, compared to when a product outcome is likely to occurs (e.g., 95% chance).

Study 2 aimed to further test whether chance events can enhance self-product connection, as well as whether this effect is driven by perceived control. After a chance manipulation, participants saw a painting and reported their perceived connection to the painting as well as perceived control when seeing the painting. I predicted that people find the self from a chance product, which would restore their perceived sense of control.

In addition to examining the mediating role of control, study 2 also aimed to rule out potential alternative process accounts related to perceptions of uniqueness, fate, and elaboration (Burrus and Roese 2006; Meyers-Levy and Tybout 1989; Sussman and Alter 2012).

Method

Participants. One hundred eight participants recruited from Amazon's Mechanical Turk participated in exchange for a small payment (55 men; 20 to 62 years; $M = 34.27$, $SD = 10.24$). The study had a single 2-cells (chance: high vs. low) between-subjects design.

Procedure. Participants were randomly assigned to either a high or low chance condition. Following Wakslak et al. (2006), participants in the high-chance condition were asked to read the following instructions (with the low-chance version in parentheses):

"Welcome to the "Consumer Research Study." The purpose of the study is to investigate how people think about various consumer products. I will pick these products randomly from the list of various types of products. In this study there is a "95 (5) % Chance" that you will see a painting. So, most (only a few) people will see the painting. As you can understand, there is a very high (low) probability that you see the painting in the experiment."

Next, all participants were asked to view the same painting. After viewing the painting, participants responded to seven items designed to measure the perceived self-product connection (Self Brand Connection Scale: Escalas and Bettman 2005): (1) The water bottle reflects who I am, (2) I can identify with the water bottle, (3) I feel a

personal connection to the water bottle, (4) I can use the water bottle to communicate who I am to other people, (5) I think the water bottle could help me become the type of person I want to be, (6) I consider the water bottle to be "me" (it reflects who I consider myself to be or the way that I want to present myself to others), and (7) The water bottle suits me well (1 = *Not At All*, 9 = *Very Much*, α = .98). Participants also responded to the items designed to measure perceived control: "When you saw the painting, how much control did you feel you have over the outcomes of what you do?" (1 = *Very Little Control*, 7 = *A Great Deal of Control*). Participants also reported the three items that measure perceived chance: (1) how predictable was to hear the previous song? (1 = *Not At All Predictable*, 7 = *Extremely Predictable*) (2) the chance of hearing the previous song is... (1 = *Very Low Chance*, 7 = *Very High Chance*) (3) the probability of hearing the previous song is... (1 = *Very Low Probability*, 7 = *Very High Probability*). These items were condensed into a single index perceived chance for analysis (α = .93).

 Other Measures. To rule out alternative accounts, I included a series of measures. Participants answered a measure of uniqueness: "The painting is..." widely available (1 = *Not At All*, 7 = *Very Much*). Participants also answered measures of fate perceptions: "When I saw the painting, I felt like seeing the painting was… predestined to happen / entirely determined by fate" (1 = *Not At All*, 7 = *Very Much*, α = .50). In addition, participants responded to two items designed to measure perceived elaboration: "When you saw the painting… (1) How much did you elaborate the painting? (2) How many thoughts did you have in your mind?" (1 = *Not At All*, 7 = *Very Much*, α = .74).

Results

Manipulation Checks. Participants felt the consumption experience was less predicted in the low chance ($M = 3.59$ $SD = 2.07$) compared to the high chance condition ($M = 5.61$, $SD = 1.34$); $t(104) = -5.86$, $p < .001$).

Self-Product Connection. Participants reported a stronger self-product connection in the low chance ($M = 5.33$, $SD = 2.58$) compared to the high chance condition ($M = 4.23$, $SD = 2.37$; $t(104) = 2.27$, $p = .025$).

Perceived Control. Participants reported greater sense of control when they saw the painting in the low chance ($M = 4.46$, $SD = 1.92$) compared to the high chance condition ($M = 3.65$, $SD = 2.00$; $t(104) = 2.11$, $p = .037$).

Mediation by Perceived Control. I predicted that the effect of condition on self-product connection should be statistically mediated by perceived control. As expected, condition (high vs. low chance) predicted perceived control (*a* path: $b = .42$, $SE = .19$, $p = .037$) and self-product connection (*c* path: $b = .55$, $SE = .24$, $p = .025$). Perceived control also predicted self-product connection (*b* path: $b = .62$, $SE = .11$, $p < .001$). A 1,000 bootstrap resample revealed an indirect effect of condition on self-product connection ($b = .25$, $SE = .14$, 95% *CI* [.01, .57]). The effect of condition on self-product connection was statistically mediated by perceived control (see fig. 3). The effect of condition on self-product connection became non-significant after perceived control was entered in the model (*c'* path: $b = .30$, $SE = .22$, $p > .16$).

I also assessed several alternative process accounts (uniqueness, fate, and elaboration). There was no significant effect of condition on those variables ($ps > .18$). Indirect effects via uniqueness (*CI* [-.01, .25]), fate (*CI* [-29, .26]), elaboration *CI* [-.15, .46]) were not significant.

FIGURE 3: THE EFFECT OF CHANCE ON SELF-PRODUCT CONNECTION

VIA PERCEIVED CONTROL (STUDY 2)
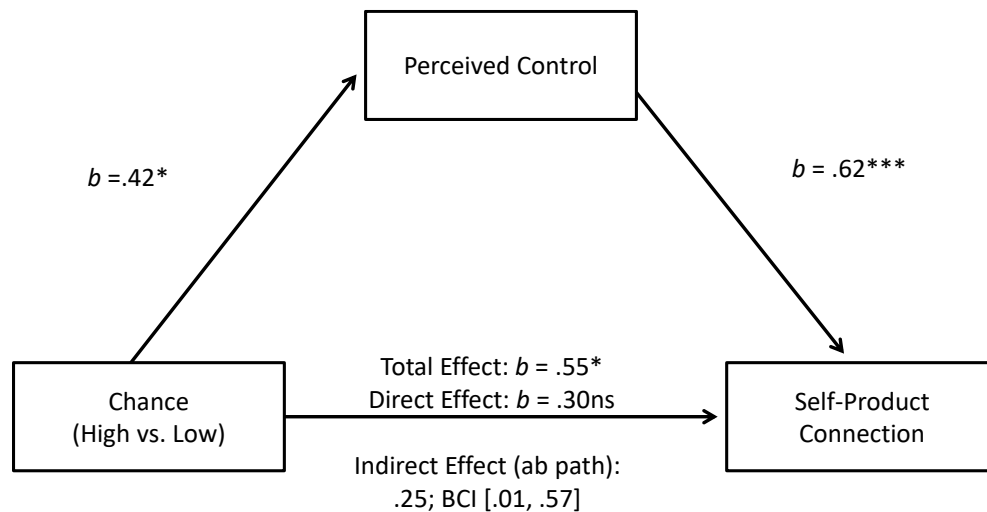
Discussion

Study 2 conceptually replicates previous findings and tests the generalizability of the effect with a different manipulation of chance and measure of self-product connection. Study 2 also provides evidence for the proposed process. Consistent with the conceptual model, consumers felt a stronger self-product connection when a consumption event occurred by chance as a way to restore control. Perceptions of uniqueness, fate, and elaboration did not account for differences in self-product connection across conditions. The following series of studies provides additional evidence for the effect of perceived chance on perceptions of self-product connection and its boundary conditions.

STUDY 3: THE CONSEQUENCE OF RESTORING CONTROL

While the previous study provided evidence for the role of restoring control via mediation, study 3 examines this process with a moderation design, by restoring control prior to the product consumption. If chance events lead people to find a stronger self-

product connection as a way to restore control, then the effect should weaken when control is restored. I predicted that chance events would lead to increased self-product connection, but not when control was restored.

Method

Participants and Design. One hundred ninety participants recruited from Amazon's Mechanical Turk participated in exchange for a small payment (98 men; 19 to 66 years; M = 34.52, SD = 9.72). The design was a 2 (chance: high vs. low) × 2 (perceived control: neutral vs. high) between-subjects design.

Procedure. All participants went through the chance manipulation, which was identical to that used in study 2. Specifically, participants were asked to read the following instructions depending on the high chance (or low chance) condition:

"Welcome to the "Consumer Research Study." This experiment has two parts. You will now do the first part of the experiment, which involves writing life experiences. After the writing task, we would like to how people think about various consumer products. We will pick these products randomly from the list of various types of products. In this study there is a "95 (5) % Chance" that you will hear a song. So, most (only a few) people will hear the song. As you can understand, there is a very high (low) probability that you hear the song in the experiment."

After explaining the structure of the experiment, participants were then randomly assigned to one of the two control conditions. Following a manipulation that has been shown to restore control (Cutright and Samper 2014), participants in the high control condition were asked to read the following instructions: "Please try and think of something that happened to you in the past few months that you had control over. In

other words, something that happened because you made it happen." They were then asked to take about one minute to write about that situation. Participants in the neutral control condition were asked to write about today's weather for about one minute. A pretest ($N = 154$) had participants complete this task and then respond to how much control they thought they had over what was going on (1 = *Very Little Control*, 7 = *A Great Deal of Control*). Participants reported lower perceptions of control in the neutral ($M = 4.32$; $SD = 2.27$) compared to the high control condition ($M = 5.52$, $SD = 1.74$; $t(152) = 3.62$, $p < .001$). This demonstrates that the stress manipulation had the desired characteristics.

After the writing task, all participants were thanked and asked to click on an arrow as they would now move to a different study while products were being selected. In the second study, a song familiar to the US sample (*Call Me Maybe* by Carly Rae Jepsen from the US pop charts) was played with the participants listening on individual headsets. After hearing the song, participants responded to the same items to measure perceptions of self-product connection from study 2 ($\alpha = .98$). Finally, participants completed the same questions that measure perceived chance from study 2 ($\alpha = .95$).

Results

Manipulation Checks. An ANOVA revealed only a significant effect of chance. Participants felt the consumption experience was less predicted in the low chance ($M = 3.07$, $SD = 1.83$) compared to the high chance condition ($M = 4.57$, $SD = 1.95$); $F(1, 182) = 29.05$, $p < .001$; occasional missing values affected the degrees of freedom); neither the main effect of control nor chance by control interaction was significant ($Fs < 1$).

Self-Product Connection. An ANOVA revealed an interaction between the control condition (neutral versus high control) and chance ($F(1, 186) = 3.94$, $p < .05$; see figure 3). In the neutral control condition, participants reported a stronger self-product connection in the low chance ($M = 4.49$, $SD = 2.51$) compared to the high chance condition ($M = 3.32$, $SD = 2.28$; $F(1, 186) = 5.87$, $p = .016$), replicating previous results. In the high control condition, however, no such difference in perceptions of self-product connection occurred between the low chance ($M = 3.90$, $SD = 2.62$) and the high chance conditions ($M = 4.16$, $SD = 2.43$; $F < 1$).

Discussion

Study 3 provided additional evidence that perceived control underlies the effect of chance on self-product connection. The positive impact of chance events on self-product connection was weakened when consumers had control restored. When control was restored before occurring chance events, consumers did not experience increased perceptions of self-product connection. I have proposed that the positive effect of chance on self-product connection should depend on the context, and should not occur when the environment does not allow for finding a connection to a product as a way to restore control even if an event occurs by chance. Next two studies test these boundary conditions.

STUDY 4: THE ROLE OF PRODUCT VALENCE

Study 4 sought to examine whether the proposed effect occurs when the product has a negative valence using a guided visualization and an actual consumption event—viewing either a negative- or positively-valenced painting. Because affect is amplified for

experiences that are connected to the self or self-serving in some way (Roese and Olson 2007), it is possible that the alignment between the self and a chance outcome may lead to a polarization of affect. Whereas positively-valenced or neutral experiences that are unexpected enhance perceived self-connection, this effect should not exist for unexpected outcomes that are negative. In other words, the proposed effect should be turned off or even reversed if the outcome is negative, whereby unexpected negative events decrease perceptions. In addition, study 4 was designed to further rule out perceptions of fate and uniqueness. Given that fate perceptions generally improve attitudes toward negative events (Lindell and Perry 1992), this suggests more powerful effects on negatively-valenced products. If this effect is driven by perceived uniqueness (Sussman and Alter 2012), there should be no difference depending on product valence. Based on the theory, people may be less likely to find connection between the self and unexpected outcomes that are negative.

Method

Participants. One hundred and twenty-four participants (53 men; 18 to 72 years, $M = 35.90$, $SD = 13.62$) were recruited from Amazon's Mechanical Turk and paid a small monetary compensation. Participants were told they are participating in a study about product preferences and that we were interested in individual differences in how people process paintings. This study used a 2 (chance: high vs. low) × 2 (valence: positive vs. negative) between-subjects design.

Procedure. Participants were randomly assigned to either a high or low chance. The manipulation of chance was identical to study 1 (i.e., visualization of a situation and a product experience—viewing a painting). Specifically, participants were asked to

imagine that they were visiting either an art gallery (high chance) or a bank office (low chance) and were asked to write a few sentences about how they envision the situation and how they would feel visiting each place. Next, participants viewed either a positive or negative painting. After viewing the painting, participants responded to the same items to measure perceptions of self-product connection from study 1 ($\alpha = .97$). Finally, participants completed the same question that measures perceived chance from study 1.

Pretest. A separate sample of participants ($N = 48$) saw either the positive or negative painting and reported their perceptions of the paintings (1 = *Extremely Unpleasant*, 9 = *Extremely Pleasant*). An ANOVA for perceived valence revealed only a significant effect of valence ($F(1, 44) = 43.03, p < .001$). People felt that the negative painting was less pleasant ($M = 4.29, SD = 2.37$) compared to the positive painting ($M = 7.83, SD = 1.24$). That is, they were significantly different from each other and also from the scale mid-point 5 ($ps < .001$).

Results

Manipulation Checks. An ANOVA revealed only a significant effect of chance. Participants felt the consumption experience was less predicted in the low chance ($M = 2.91, SD = 1.84$) compared to the high chance condition ($M = 5.73, SD = 1.53$); $F(1, 114) = 84.07, p < .001$; occasional missing values affected the degrees of freedom); neither the main effect of valence nor chance by valence interaction was significant ($ps > .12$).

Self-Product Connection. An ANOVA revealed a main effect of valence ($F(1, 120) = 30.97, p = .005$), whereby participants reported a stronger self-product connection to the positive painting ($M = 5.08, SD = 2.20$) compared to the negative paitning ($M = 4.13, SD = 2.52$). However, there was no main effect of chance ($p > .40$). More

importantly, consistent with the prediction, these main effects were qualified by a significant two-way interaction between chance and valence ($F(1, 120) = 13.04$, $p < .001$, see fig. 4). Specifically, when a product had a positive valence, participants reported stronger self-product connection in the low chance ($M = 5.78$, $SD = 2.20$) compared to the high chance condition ($M = 4.57$, $SD = 2.58$; $F(1, 120) = 4.00$, $p < .05$). In contrast, when a product had a negative valence, the pattern was reversed. Participants reported stronger self-product connection in the high chance ($M = 4.90$, $SD = 2.06$) compared to the low chance condition ($M = 2.96$, $SD = 2.73$; $F(1, 120) = 9.52$, $p = .003$).

FIGURE 4: THE EFFECT OF CHANCE AND VALENCE ON SELF-PRODUCT CONNECTION (STUDY 4)
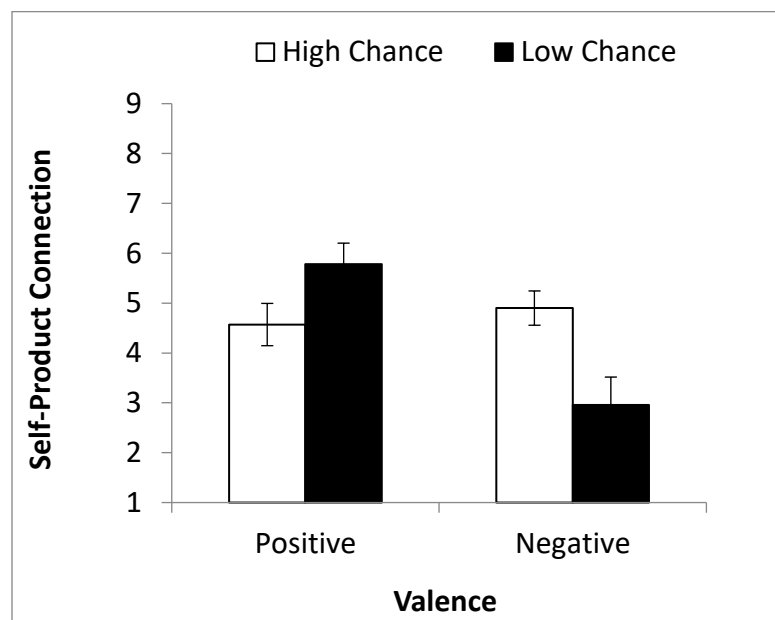
Discussion

Study 4 provides additional evidence for this effect and found that the positive impact of chance on product evaluations did not occur, and was reversed, when a product had a negative valence. I also found that chance did not enhance the self-product connection for a negatively-valenced product. This may have occurred because people

tend to suppress negative attributes of their self-concept (Russo et al. 1998; Shafir et al. 1993; Taylor and Brown 1988) and typically approach positive and avoid negative objects and outcomes (Higgins 1997). In addition, study 4 provides evidence that the propsoed effect does not result from fate perceptions. Fate perceptions generally improve attitudes toward negative events (Lindell and Perry 1992). However, negatively-valenced products were perceived to be even less pleasing when unexpected. The next study strengthened the conceptual model by manipulating an ego-centric versus non-ego-centric mindset.

STUDY 5: FOCUS ON THE SELF VERSUS OTHERS

The primary objective of study 5 is to replicate previous findings using a different measure of self-product connection and explore a theoretically relevant boundary condition. Up to this point, I have theorized that product experiences occurred by chance lead consumers to find a stronger link between the product and their own self-concept as a way to restore control. This effect occurs based on the assumption that people use the self a "master motive" that organizes and maintains consistency in their ideas and behavior (Lecky 1945). Thus, this effect should be attenuated when consumers are led to focus on others and not the self. To test this, in study 5, I induce either an ego-centric (self-focused) mindset or a non-ego-centric (other-focused) mindset.

Method

Participants and Design. Study 5 had one hundred and ninety-two undergraduate participants (95 men; 18 to 34 years; $M = 20.82$, $SD = 1.99$) who were recruited in return

for course credit. This study used a 2 (mindset: ego-centric vs. non-ego-centric) × 2

(chance: high vs. low) between-subjects design.

     Procedure. The procedures were similar to that used in previous studies.

However, participants were first randomly assigned to one of the mindset conditions

based on previous research (Gardner, Gabriel, and Lee 1999). Specifically, participants

were asked to find self (ego-centric) versus other references (non-ego-centric) after

reading a paragraph. In the ego-centric mindset condition, participants were asked to

circle *I*, *me*, and *my* (ego-centric mindset) in the following paragraph:

> "*I go to the city often. Sometime I go by bus. Sometimes I travel by car. Before I go I like to anticipate what I will see. My anticipation fills me as I see the skyscrapers come into view. I allow myself to explore every corner, never letting an attraction escape me. My voice fills the air and street. My feeling touches all the places I have seen. I see all the sights, I window shop, and everywhere I go I see my reflection looking back at me in the glass of a hundred windows. I walk, I run, I let my imagination fly throughout my exploration. At nightfall I linger, my time in the city almost over. When finally I must leave, I do so knowing that I will soon return. The city belongs to me.*"

The non-ego-centric mindset condition followed the same procedure, but replaced words

that are relevant to the self with words that are relevant to others. In the non-ego-centric

mindset condition, participants were asked to circle *we*, *us*, and *our* in the following

paragraph:

> "*We go to the city often. Sometime we go by bus. Sometimes we travel by car. Before we go we like to anticipate what we will see. Our anticipation fills us as we see the skyscrapers come into view. We allow ourselves to explore every corner, never letting an attraction escape us. Our voices fill the air and street. Our feeling touches all the places we have seen. We see all the sights, we window shop, and everywhere we go we see our reflection looking back at us in the glass of a hundred windows. We walk, we run, we let our imaginations fly throughout our exploration. At nightfall we linger, our time in the city almost over. When finally we must leave, we do so knowing that we will soon return. The city belongs to us.*"

After reading the paragraph, all participants were randomly assigned to either a high or low chance condition. As in previous studies, I manipulated chance by leading participants to visualize a series of situations before viewing a painting. Specifically, participants were asked to imagine that they are visiting either an art gallery (high chance) or a bank (low chance) and were asked to write a few sentences about how they envision the situation and how they would feel visiting each place. Next, all participants were asked to view the same painting.

After viewing the painting, participants responded to the item designed to measure the perceived self-product connection: "When you saw the painting, did you find something connected to yourself?" (1 = *Not At All*, 9 = *Very Much*). Participants were also asked to report the perceived self-product connection by indicating the gap between two circles after reading the instruction: "One circle (self) is representing YOU and the other circle is representing the painting you saw. Select the picture that best represents your relationship with the painting (1 = *Not At All Overlapped*, 7 = *Entirely Overlapped*)." Participants were also asked to describe the painting following the instruction: "Please think about the previous painting. Take one minute and write about how you feel about the painting." I counted the number of self-references used to describe the painting through mentions of "I," "me," "my," or "mine." These items were condensed into a single index self-product connection for analysis (α = .64). Finally, participants completed the same question that measures perceived chance from study 1.

Results

Manipulation Checks. An ANOVA revealed only a significant effect of chance. Participants felt the consumption experience was less predicted in the low chance (M =

2.78, $SD = 1.71$) compared to the high chance condition ($M = 5.12$, $SD = 1.76$); $F(1, 167) = 74.92$, $p < .001$); no other effect was NS ($ps > .19$).

Self-Product Connection. There was a significant two-way interaction between mindset and chance on self-product connection ($F(1, 188) = 4.18$, $p < .04$, see fig. 5); no other effect was significant ($Fs < 1$). Specifically, in the ego-centric mindset condition, participants reported stronger self-product connection in the low chance ($M = .20$, $SD = .77$) compared to the high chance condition ($M = -.12$, $SD = .70$; $F(1, 188) = 3.86$, $p = .05$). In the non-ego-centric mindset condition, when participants were first led to think about others not the self, there was no difference in self-product connection between the low chance ($M = -.02$, $SD = .82$) and the high chance condition ($M = .11$, $SD = .75$; $F < 1$), consistent with the predictions.

FIGURE 5: THE EFFECT OF CHANCE AND MINDSET ON SELF-PRODUCT CONNECTION (STUDY 5)
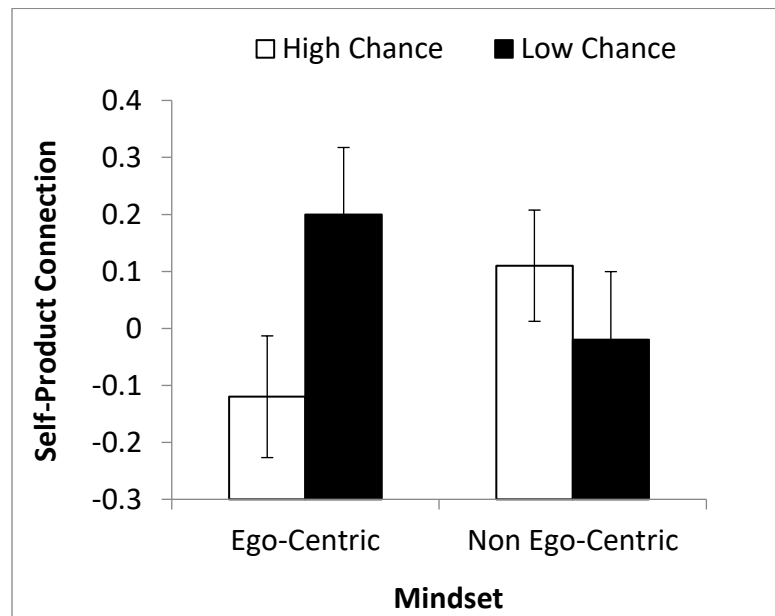
Discussion

Study 5 provides additional evidence that a chance event leads to enhanced pleasure because consumers perceive a stronger self-product connection. Inducing an other-focused mindset mitigated the effect of perceived chance on increased self-product connection. This result is consistent with the exploratory study discussed earlier. When asked to write about a serendipitous event that occurred by chance, people used more self-referent words compared to those asked to write about a mere positive event. These findings also support the prediction that consumers may replace a weak connection between the product and the situation with a stronger connection between the product and the self, producing the perception of a product or event being "meant for me."

GENERAL DISCUSSION

The current research began with the question of whether a chance event makes consumer experiences more favorable and focused on why and when such unexpected encounters come to be perceived more positively. Recall the two consumers discussed at the outset of this article: one who encountered a painting at an art gallery and another who encountered a painting at a clothing store. While some research suggests that a painting in an art gallery would be perceived more positively (Lee and Labroo 2004; Reber et al. 1998; Winkielman and Cacioppo 2001), the current research suggests that this assumption does not account for the effect of chance on perceptions of low control and the subsequent desire to restore it (Cutright 2012; Cutright and Samper 2014; Hamerman and Johar 2013). I proposed that when consumers encounter a chance product, they establish a sense of control by imputing a stronger connection between the

product and their own self-concept. This is consistent with work that has found that

unpredictability can lead consumers to attempt to re-establish a sense of control (Burger

and Hemans 1988; Heine et al. 2006; Pittman and Pittman 1980; Whitson and Galinsky

2008) and that one way people re-establish predictability is to infer that they are

interacting with an object that has a strong connection to the self (Kray et al. 2010; Lecky

1945; Rosenberg 1986). I supported the hypotheses in five studies.

I propose that, because chance events are associated with low control and low

control leads to attempts to restore control, chance events lead consumers to impute a

stronger self-product connection. Chance events lead consumers to impute a stronger

self-product connection (study 1). Enhanced self-product connection was driven by

perceived control associated with chance events (studies 2 and 3). The effect of perceived

chance on enhanced self-product connection was attenuated and reversed when the

product was negatively-valenced (study 4). And, consistent with the conceptualization of

why chance events lead to enhanced self-product connection, the effect was not evident

when consumers were led to focus on others and not the self (study 5). These effects

emerged regardless of limited mental resources (study 1), suggesting that the proposed

effect is not due to differences in elaboration between high versus low chance conditions.

Theoretical Implications

This research makes an important contribution to the literature on how situational

factors and self-connection influence consumer experience (Chugani et al. 2015; Faraji-

Rad and Pham 2017; Oyserman 2009; Ryan and Deci 2000; Ward and Broniarczyk

2011). Limited research suggests that chance events lead to positive evaluations (Kray et

al. 2010; Morewedge et al. 2014; Redden, Haws, and Chen 2017; Valenzuela at al. 2010),

but little is known about why unexpected events come to be imbued with enhanced pleasure (i.e., serendipity). Whereas previous work has focused on whether chance events affect perceptions, the current research focused on whether and why unexpected product encounters enhance perceptions of self-product connections.

I proposed and found that the lack of connection between a situation and a product—the operationalization of perceived chance—created stronger connections to the product and enhanced the consumer experience. Unexpected products consumed by chance could be more favorable because consumers imputed a stronger connection between the product and their self-concept as a way to resolve a sense of control. Whereas previous work has focused on whether self-product connections affect product evaluations (Berger and Ward 2010; Birdwell 1968; Gao et al. 2008; Weiss and Johar 2013; White and Argo 2009), the current research focused on when and why self-product connections can increase. While I have advanced knowledge with some of these findings, it is important to broaden the scope of products and examine what kind of implications serendipity has on purchase intentions. One important question is whether consumers are more likely to purchase products that are encountered unexpectedly. Another question is whether or not this effect holds across other products such as durable goods or services. For instance, it is possible that this effect has implications for romantic relationship formation, whereby potential partners that are encountered unexpectedly within a dating service are evaluated more positively. Further research could examine differences in purchase behavior across unexpected and expected product encounters, as well as the breadth of products and services for which this effect occurs.

The current research also informs work on choice and satiation (Botti and Iyengar 2006; Botti and McGill 2006; Chernev 2003; Iyengar and Lepper 2000; Nelson and Meyvis 2008; Redden 2008). Whereas previous work has focused on how different choice contexts affect consumer behavior, the current research removed expectation—which tends to be high in choice contexts. These findings suggest that consumers may experience increased attachment to a product when the consumption event lacks controlled choice (Redden et al. 2017). Future work could examine whether this effect buffers against satiation, sustaining enjoyment over time.

This research also contributes to knowledge of the consequences of low control. We know that people try to restore control by adjusting their beliefs (Friesen et al. 2014; Kay et al. 2008; Kay and Eibach 2013) and by changing their product preferences (Cutright and Samper 2014). Showing that under low control consumers may not need specific products, but may simply change how much they feel connected to any product (at least when they attempt to restore control or when the environment allows for finding connection to a product as a way to restore control), may open the door for different types of control restoration behaviors. While the behavior here was shifting perceptions of self-product connection, other types of cognitions and motor behaviors may be used to restore control. For example, people may enhance perceptions of self-product connection by psychologically visualizing an interaction with products or by physically touching them more often, which could be helpful in restoring control.

Practical Implications

This research has important implications for consumers and marketers. For consumers, we show that perceived self-product connection can be enhanced when

consumers encounter a product by chance. Consumers may be able to enhance connection to a brand or a product by selecting delivery services that distance a situation from an outcome such as digital music streaming, wine clubs, or services such as Birchbox that deliver a random selection of products to the consumer each month. In terms of dating, encounters that occur by chance such as meeting a potential partner at the gym or grocery store may enhance perceived closeness to the partner and sustain attraction. This has potentially important implications for consumers who use dating apps like *Tinder* or other services that involve strong expectation of an outcome and an endless set of alternatives. In fact, the current studies may underestimate the positive effects of unexpected events as participants were either in static laboratory conditions or participating on MTurk were they could easily see they would be evaluating a product or imagining a hypothetical situation. In everyday life, many encounters occur with much less expectation and experiences may very well be enhanced beyond what I have found in the current research.

From a consumer welfare perspective the improved self-product connection that may result from an unexpected encounter could have detrimental effects in some consumption contexts. Given that excessive hedonic pleasure can result in a self-regulatory failure, a lack of expectation may be detrimental in consumer contexts where maintaining a self-regulatory goal is critical (dieting, alcohol consumption, saving; Redden and Haws 2013). Therefore, in such contexts where increased self-product connection is not desired because it could lead to over-indulging, increasing expectation and predictability in the consumer context could actually lead to better outcomes by minimizing unnecessary attachment to the products.

For marketers, a potentially valuable insight is unexpected product encounters can systematically create a new partnership with a brand or a product. This insight can inform strategies for promotion tactics such as induced trails via sampling, mailers, and event marketing, whereby marketers can take extra steps to imbue such situations with serendipity by simply removing expectation. For example, investment in mail-delivered product sampling may be more effective at converting to an actual in-store purchase than mail-delivered coupons because consumers may perceive a stronger connection to the product by the arrival of a product in one's mailbox, which may lead to repeat purchase intentions. Companies may also benefit from the creation of consumer experiences that afford more opportunities for unexpected encounters such as vacation packages with events (e.g., performances) that appear somewhat impromptu to the consumer.

Limitations and Future Directions

In order to test the proposed mechanism, I artificially manipulated the strength of the connection between a preceding situation and an outcome by asking participants to recall a recent event or asking to visualize hypothetical scenarios. I chose to conceal all other factors such as product information (e.g., brand name, price, or quality, etc.). Thus, the current findings do not disambiguate whether or not similar effects would emerge when additional information about the product is available to the consumer. One possibility is that the proposed effects emerged precisely because no other information was provided. I speculate that similar effects would emerge even in the presence of information such as brand name, but may attenuate as additional information or alternative options are provided and consumers spend more resources to process product

information. Such deliberation might prevent consumers from implicitly finding a strong link between a product and their own self-concept.

Across studies I also did not use products that are associated with strong, pre-existing brand preferences (e.g., colas). Thus, another possibility is that the proposed effects are specific to the experience of products or services for which pre-existing preferences or brand loyalty are not strong (e.g., Chernev 2003). However, I found that this effect emerged regardless of product familiarity, suggesting that this effect may emerge—and perhaps be even stronger—for products for which a consumer has a strong pre-existing preference.

Further, it is possible that the proposed effects would not emerge for certain products. For example, this effects may be less evident for durable goods that are relatively expensive (car, appliances) or for products or services that are undesirable (surgical procedures, medical treatments), which is consistent with the results of study 4 whereby no effect emerged for a negatively-valenced product.

There are also likely to be other contexts in which this effect may be mitigated or reversed. For example, when a product is already connected to the self, perceptions of self-product connection may not be enhanced even when the situation and the product experience are weakly aligned (i.e., low chance events). Because consumers' perceptions of self-product connection can increase only when the environment allows for finding connection to a product as a way to restore control, I believe that the positive effect of chance events occurs more strongly during solo consumption than joint consumption, which is consistent with results of study 5. In a similar vein, cultural differences in self-

construal could moderate this effect such that this effect might be weakened in Eastern cultures due to relatively weak ego-centric mindsets. Future research is warranted.

Conclusion

I presented a conceptualization and five studies demonstrating how, why, and when the consumer experience can be enhanced by chance events. Results suggest that consumers may experience enhanced pleasure because they come to see unexpected outcomes as particularly linked to their self-concept as a way to restore a sense of control, consistent with the notion of being "meant for me." Given that relatively little consumer research has examined consumer encounters that occur by chance, future work is poised to build on these findings to further consider the varied effects that can emerge when the absence of expectation signals the presence of serendipity.

Essay II: The Effects of Romantic Motives on Numerical Preferences

INTRODUCTION

A pair means a set of two things. One schema that is tightly linked to the concept of "2" is a romantic pair-bond. Across cultures and throughout history, people learn from an early age that two (or a pair) is symbolic of romantic love. For example, in biblical depictions of Noah's ark, the reader learns that the world faced an impending, life-destructing flood and a vessel was created to ensure the survival of humans and all other living organisms (e.g., The Bible, Genesis: 6-9). The ship was boarded by Noah and his wife along with two of each of every living creature on earth—a pair. Romantic love songs also abound with references to the number "2", many reaching the top of the music charts: *Two of Us, Tea for Two, Two Hearts, Just the Two of Us,* and *Two Tickets to Paradise*, to name only a small few. If romantic love is associated with the number "2", is it possible that when people are reminded of romance they prefer the number "2"? The current research examines whether romantic motives lead people to prefer the number "2", as well as the downstream implications of this preference for consumer behavior.

Many environmental cues can trigger romantic motives – goals related to forming a romantic relationship (Jones and Barlow 1990). For example, the presence of an attractive person of the opposite sex can boost thoughts about mating (Griskevicius, Cialdini, and Kenrick 2006; Roney 2003). Even simply browsing an online dating site, viewing a desirable person on television or in a magazine, reading romantic stories, or watching romantic movies can evoke romantic desire (Griskevicius et al. 2009). Because of the importance of mating in human lives and the ubiquity of such environmental cues that can elicit mating-related thoughts, a growing body of literature has examined the role of romantic motives in consumer judgment and decision-making (Durante and Arsena

2015; Griskevicius et al. 2007; Hill et al. 2012; Sundie et al. 2011). Much of the previous work examining how romantic motives influence decisions and preferences has focused on how these motives shift desire for products closely related to mating, such as sexy clothing (Durante et al. 2011). Other work has focused on how products or advertisements closely related to mating might themselves elicit mating motives, such as advertisements containing sexual images (Dahl, Sengupta, and Vohs 2009) or scenes from romantic movies (e.g., *Before Sunrise*; Griskevicius et al., 2009). The current work aims to extend this literature to examine whether and how romantic motives influence consumer response to the abstract concept of numbers.

Drawing on research in goal pursuit and numerical cognition, I propose that romantic motives increase preference for the number "2", and that this preference may extend to preference for even (vs. odd) numbers and marketing stimuli featuring even (vs. odd) numbers. Six studies provide convergent support for this proposition, rule out alternative hypotheses, and demonstrate boundary conditions. Specifically, I found that romantic motives, but not motives related to other social relationships such as work relationships, friendship, and kinship, enhance preference for "2" and associated even numbers. In addition, and in line with the goal-based reasoning, the proposed effect is attenuated when a romantic partner is easy to find or having a romantic relationship with one partner is not important.

CONCEPTUAL DEVELOPMENT

Effects of Romantic Motives

Mating is a fundamental and universal human goal. Most people go on dates, fall in love, and form an exclusive romantic partnership at some point in their lives (Buss & Schmitt, 1993). Given the importance of romantic partnerships across human history, various external environments and situations can trigger mating-related thoughts (Jones & Barlow, 1990). For instance, merely being exposed to an attractive person of the opposite sex in media (e.g., magazine, television, or websites) can elicit a romantic motive (Dahl, Vohs, & Sengupta, 2011).

Research in this area has demonstrated that romantic motives can influence consumer behavior. For example, mating goals can increase openness to variety and novelty, attributes that can aid an individual in their mating pursuit by helping them stand apart from their competitors and increase the number of partners to choose from (Durante and Li 2009; Larson et al. 2013). This shift in preference for novelty can subsequently influence variety-seeking behaviors in consumption (Chen, Zheng, Zhang 2015; Durante and Arsena 2015). Furthermore, given that mating often demands one outcompete others to attract a mate (Durante et al. 2014; Miller 2000), people are likely to think and act creatively when romantic motives are salient (Griskevicius et al., 2006), which may increase their receptiveness to unique concepts and ideas such as dissimilar brand extensions and uncommon products (Monga and Gürhan-Canli 2012). Here, I do not consider how mating motives influence product preferences, but instead examine whether mating motives increase preference for numbers that are conceptually and symbolically related to a romantic pair-bond between two people.

Goal-driven cognitions, romantic motives, and numerical preferences

Goals are defined as a desired transition from an actual state to a preferred state (Street, 2002). The literature in this field has shown that engaging in goal pursuit can lead to a variety of affective, cognitive, and behavioral consequences (Bagozzi and Dholakia 1999; Fishbach and Dhar 2005; Kivetz, Urminsky, and Zheng 2006; Soman and Cheema 2004). One set of findings that is relevant to the present theorizing is that goal activation can facilitate knowledge that is consistent with the goal. Building on the notion that goals are mentally represented in the same way as other abstract concepts such as schemas, stereotypes, attitudes, and traits (Chartrand and Bargh 1996; Shah and Kruglanski 2003), extant studies have shown that once a particular goal is activated, information that is relevant to this goal becomes more accessible (Bargh 2006; Williams, Huang, Bargh 2009). For example, when a person frequently rides a bicycle to their university, the activation of a goal to attend lectures at the university can automatically evoke mental depictions of a bike (i.e., the action necessary to complete the goal; Aarts and Dijksterhuis 2000).

Individuals who are actively engaged in pursuing a goal also tend to evaluate goal-relevant objects more favorably while objects that are irrelevant to the pursuit of the goal are devaluated (Brendl, Markman, and Messner 2003). For example, thirsty people evaluate words related to drinking more positively (e.g., water, juice) than goal-irrelevant words (Ferguson and Bargh 2004). Likewise, an active goal can lead people to devalue actions or objects that are perceived to be harmful to their goal progress. For example, video games become less desirable for students who are reminded of their current coursework, but not for students who are reminded of their completed coursework (Fishbach, Zhang, and Trope 2010). Similarly, a dieting goal leads people to estimate a

cake to contain more calories and dampens their willingness to consume the treat (Zhang, Huang, and Broniarczyk 2010).

In sum, past research on goal pursuit has shown that an active focal goal can increase the mental accessibility of goal-relevant objects. Building on these findings, I investigate whether a mating goal can also increase the accessibility and favorability of an abstract concept (i.e., numbers) that is conceptually connected with the focal goal. I argue that romantic motives should increase individuals' preferences for even (vs. odd) numbers, which are more compatible with the goal of having a romantic pair-bond relationship. Below, I elaborate on this premise.

Psychological meanings of even and odd numbers. Numbers play a significant role in our lives. In addition to communicating quantities such as prices, sizes, and weight (Dehaene 2011), numbers can also express psychological meanings (Battig and Spera 1962; Bellos 2015; Cochran and Wickens 1963; Knapp and Chen 1964). For example, people often associate precise numbers (compared to round numbers) with confidence and credibility. In one study, Jerez-Fernandez, Angulo, and Oppenheimer (2014) asked participants to play the game "The Price is Right." They were asked to estimate the price of three different products with the audience's help. The prices that the audience suggested were either round or precise. In agreement with the authors' reasoning that precision signals confidence, the authors found that the participants preferred receiving advice from people who provided precise estimates compared to those who provided rounded estimates.

In this research, I propose that individuals associate the number "2" with romantic relationships and because both even numbers and romantic relationships are strongly

related to the even number "2", I hypothesize that activating a mating motive will lead to a preference for the number "2" and other associated even numbers. Because even numbers can be divided by 2 while odd integers cannot be without leaving a remainder of 1, even numbers are associated with their exemplar "2" while odd numbers share features associated with their exemplar "1" (Berch et al. 1999).

Importantly, in many cultures such as in the United States, couples are also characterized by the number 2 (i.e., a committed romantic pair-bond between two people). One reason that this occurs is because most relationships are monogamous and therefore involve two people (Buss and Schmitt 1993; Cockburn, Legge, and Double 2002). The downstream consequence of this duality is that couples structure their consumption purchases by 2, often purchasing products such as wedding rings, pillows, and travel packages in pairs. Demonstrating further support for the association between numerical parity and romantic relationships, "2" and associated even numbers are frequently depicted in weddings. For example, Chinese weddings often involve people decorating gates and windows with the symbol 囍, meaning "double happiness." In addition, people in Chinese cultures have strong preferences for even numbered months and dates for their wedding days (e.g., October 28, 2004). Even gifts for the bride and groom are supposed to come in even numbers, including a delivery of the bride's dowry and the sewing basket for wedding gifts are preferred if they come in even numbered rolls of colorful thread, needles, and scissors (Seong 2015).

While the literature and some of the anecdotes mentioned above support the notion that romantic motives increase individuals' preference for not only the number "2" but also other even numbers (which are conceptually connected to 2), I conducted an

exploratory study to directly validate the premise that the concept of "2" is generalizable to other even numbers. Specifically, this study tested whether mere exposure to the number "2" can increase preference for even (vs. odd) numbers. Participants ($N = 182$) were randomly assigned to either a neutral or a "2" prime condition. All participants were asked to assess ten font designs along a 5-point scale (1 = *Dislike Very Much* to 5 = *Like Very Much*). While I used the same ten fonts across conditions, the content was either XZFBZRMZW (neutral condition) or X2FB2RM2W (2 prime condition). Afterwards, participants then moved to an unrelated task which asked them to choose their favorite number from 1 to 99. Consistent with the prediction, "2" primes led participants to choose even numbers as their favorite numbers (54.9 %), compared to neutral primes (27.5 %, $\chi^2 = 14.17$, $p < .001$). To test the robustness of this connotation between "2" primes and parity preferences and show potential downstream effects using marketing stimuli, I conducted another exploratory study with a separate sample of participants ($N = 59$). Participants were randomly assigned to conditions using a 2 (prime: neutral vs. 2) × 2 (number: odd vs. even) × 7 (replicate) mixed design. The first two factors were varied between subjects. After the priming task (same as the previous study), all participants moved to a shopping scenario. In the odd-number condition, participants were asked to examine seven products that included odd numerical attributes: Water (15oz), Cheese (2.25lb), Chocolates (17ea), Peach (7ea), Olive Oil (23oz), Beef (4.63lb), and Flour (4.87lb). In the even-number condition, participants were asked to examine seven products that included even numerical attributes: Water (14oz), Cheese (2.24lb), Chocolates (16ea), Peach (6ea), Olive Oil (22oz), Beef (4.62lb), and Flour (4.86lb). Participants reported how likely they would buy each product (1 = *Not At All*, 5 = *Very*

Much, $\alpha = .60$). A repeated measures ANOVA on participants' purchase intention only revealed a significant two-way interaction of prime type and number type on purchase intention ($F(1, 55) = 4.78$, $p = .03$). Specifically, in line with our reasoning, when the quantities of products were even numbers, the "2" prime increased purchase intention ($M = 3.22$, $SD = .68$) compared to the neutral prime ($M = 2.64$, $SD = .33$; $F(1, 55) = 7.13$, $p < .01$). When the quantities of products were odd numbers, however, the "2" prime did not increase purchase intention ($M = 2.99$, $SD = .78$) compared to the neutral prime ($M = 3.09$, $SD = .47$; $F(1, 55) = .19$, $p > .66$). In addition, there was a significant within-subjects effect ($F(1, 55) = 15.5$, $p < .001$; all other effects: $ps > .12$), suggesting variance among different stimuli. In summary, the convergent results from these studies using a mere exposure to the number "2" provide support for the notion that the elevated accessibility of number 2 enhances participants' preference for even numbers in general.

Given the overarching schema of "2" that is associated with a pair-bond between romantic partners, I suggest that when mating goals are activated, even numbers, which are conceptually connected with romantic relationships, will become more accessible and will be evaluated more favorably. Because odd numbers are not associated with such meaning, I propose that evaluations of odd numbers will not be influenced by mating goals.

Boundary conditions. There are two theoretically-derived boundary conditions for the proposed effect. First, past research suggests that the strength of the proposed effect depends on how eager a consumer is to achieve their goal (how salient the goal is in the consumer's mind). Individuals often adopt a goal when there is a discrepancy between the individuals' actual state and their desired state (Higgins et al. 1986). By choosing to

pursue a particular goal, people are motivated to accomplish their chosen goal, which results in close monitoring of whether the proper implementation is established to make progress toward the goal (Heckhausen 1977). Accordingly, if the effect of romantic motives on numerical preferences is a reflection of a current goal versus simply a cognitive cue, the effect should be reduced when a goal is easy to achieve, and people are less likely to expend effort to accomplish the goal. Following this reasoning, I propose that the effect of romantic motives on numerical preferences will be less pronounced among individuals who perceive that a romantic partner is easy to find.

Second, the theorizing is based on the assumption that the number two is symbolic of a romantic relationship. While by and large this assumption is true across cultures and throughout history, it may not hold for some individuals who do not follow a mating strategy that involves a pair-bond. Thus, I conjecture that the proposed effect will be weakened for those who are more promiscuous (many partners) compared to individuals who believe that mating practices are generally monogamous and practice monogamy (one partner for each person) (Cockburn et al. 2002; Trivers and Willard 1973).

It merits mentioning that testing these boundary conditions allows me to isolate the motivation-based explanation from other alternative accounts. For example, an alternative explanation would suggest that enhanced preference for even numbers when mating goals are active is due to mental association. Because romantic motives and even numbers are more closely related, the activation of one could increase the accessibility and favorability of another. However, this alternative account would not predict any difference between participants who perceive that a romantic partner is easy to find, nor

any difference between individuals who are more monogamous and those who are more promiscuous.

RESEARCH OVERVIEW

I tested the predictions in six studies. Study 1 assessed whether romantic motives increase participants' preference for the concepts of "2" using a word completion task. Study 2a tested whether romantic motives increase participants' preference for even numbers by directly measuring their favorite number. Building on these findings, I examined whether perceived importance of forming a romantic pair-bond mediates the proposed effect (study 3). Further, I examined whether the effect attenuates when a romantic partner is easy to find (study 4) or when an individual endorses a promiscuous lifestyle (study 5). Finally, I tested whether the effect exists when motivations to establish a non-romantic relationship, such as a work partnership (study 2a), friendship (study 2b), and kinship (study 4).

STUDY 1: ROMANTIC MOTIVES & PREFERENCE FOR THE NUMBER "2"

Study 1 was designed to assess a critical piece in the theorizing. That is, I propose that, compared to a low-romantic condition, high-romantic conditions should enhance the accessibility of concepts related "2", and in turn make "2"-related words (e.g., two, couple, duo, pair etc.) easier to process. To this end, study 1 employed a word fragment completion task that has been shown to be a valid measure of concept accessibility (Anderson, Carnagey, & Eubanks, 2003).

Method

Participants and Design. This study used a 2-cell (romantic motive: low vs. high) between-subjects design. One hundred and twenty-five undergraduates (68 males; 18 to 25 years; $M = 20.01$, $SD = 1.07$) participated in this study in return for the credits.

Procedure. This study consisted of two parts. Part 1 was a priming task designed to elicit romantic motives. All participants were randomly assigned to either a high- or low-romantic condition and were asked to "read the scenario carefully and try your best to put yourself into the situation and imagine that it is actually happening." Romantic motives were primed via a guided visualization exercise that has been shown to successfully elicit strong romantic emotions and motivations in previous literature (Durante and Arsena 2015; Griskevicius et al. 2006, 2007, 2009; Li et al. 2012; Monga and Gürhan-Canli 2012; Sundie et al. 2011). Participants in the high-romantic condition were asked to imagine meeting someone desirable and spending a wonderful day and having dinner with that person (Durante and Arsena 2015). The gender of a dating partner in the scenario was designated by their response to the question: "Right now, which gender are you primarily sexually attracted?" (1 = *Women*, 2 = *Men*). In the low-romantic condition, participants were asked to imagine doing laundry that does not involve any romantic connotations (The full scenarios are presented in the Appendix A).

Participants then moved to an ostensibly unrelated word completion task. Following from Anderson et al. (2003), this task required participants to complete word fragments: "PAI ( )", "D ( ) O", "T ( ) O", and "COU ( ) E". These word fragments could be completed in multiple ways. For example, "COU ( ) E" could be completed as "course (neutral) or "couple" (conceptually related to "2").

After the word completion task, participants were asked: "While envisioning the situation, to what extent did you feel romantic?" (1 = *Not At All Romantic*, 7 = *Extremely Romantic*). Participants also indicated their relationship status by answering yes or no to a single item: "Are you currently in a committed relationship with one partner?" (single: n = 74). Finally, participants responded to additional background questions including age and gender and were thanked.

Results

Manipulation Check. As expected, participants felt more romantic in the high-romantic (*M* = 4.64, *SD* = 1.54) compared to the low-romantic condition (*M* = 1.77, *SD* = 1.37, *t*(123) = -11.00, *p* < .001).

Hypothesis Tests. Following Anderson et al. (2003), participants' responses were classified into "2"-related or neutral category. The dependent variable was the number of completions that were conceptually related to "2". Consistent with the reasoning, participants in the high-romantic condition (*M* = 1.89, *SD* = .94) generated more words that are conceptually related "2" as compared to those in the low-romantic condition (*M* = 1.54, *SD* = .81, *t*(123) = -2.22, *p* < .03). Neither gender, age, nor relationship status interacted with independent variable (*ps* > .12).

Discussion

Study 1 provides support for the primary hypothesis. Romantic motives led to an increased preference for the "2". The findings show that low (vs. high) romantic motives increase the accessibility of "2"-related concepts. Building on these results, subsequent studies examine whether romantic motives also enhance preference for even (vs. odd) numbers.

STUDY 2A: ROMANTIC MOTIVES & PREFERENCE FOR EVEN (VS. ODD) NUMBERS

Study 2a examined whether romantic motives enhance preference for even (vs. odd) numbers. As an initial investigation, this study asked participants to freely pick their favorite number from 1-99. In addition, study 2a was also designed to evaluate a possible alternative account. Because a romantic relationship is only one form of a social relationship, it might be the case that reminding participants of *any* social relationship leads to enhanced preference for even (vs. odd) numbers. To evaluate this alternative account, study 2a used a control condition in which participants imagined a relationship with a work colleague.

Method

Participants and Design. This study used a 2-cell (romantic motive: work relationship vs. romantic partnership) between-subjects design. I recruited one hundred participants (49 men; 18 to 74 years; $M = 35.79$, $SD = 12.83$) from MTurk who were paid a small monetary compensation.

Procedure. Following previous research (Griskevicius et al., 2006; Roney, 2003; Wilson & Daly, 2004), I manipulated romantic motives by having participants view a photograph of an attractive opposite-sex person and imagine a hypothetical romantic scenario. While all participants viewed a photo of an attractive person of the opposite sex, the situations involving the person that they imagined were different depending on the conditions. Specifically, participants in the high-romantic condition were instructed to imagine that they were searching for a dating partner on an online dating website, while those in the low-romantic condition imagined that they were searching for a project

partner for work. To strengthen the prime manipulation, participants in the high-romantic condition were asked to visualize and write about their feelings and thoughts about how a romantic date with this person might go, while those in the low-romantic condition visualized and wrote about how it would be to work on a project with this person. Afterwards, all participants moved to an unrelated task which asked them to choose their favorite number from 1 to 99. Participants also indicated their relationship status (1 = Not dating/romantically involved with anyone, 2 = Involved with more than one partner, 3 = Dating, 4 = Engaged, 5 = Living with my partner, 6 = Married, 7 = Other). I coded 1 for participants who were engaged, co-habiting, or married to one partner (4, 5, or 6; n = 51), and -1 otherwise. Finally, participants responded to additional background questions including age and gender and were thanked.

Pretest. A separate sample of participants ($N = 34$) completed the priming task in one of the two conditions described above. Then participants were asked: "While envisioning the situation, to what extent did you feel romantic?" (1 = *Not At All Romantic*, 7 = *Extremely Romantic*). As expected, participants felt more romantic in the high-romantic ($M = 3.00$, $SD = 1.17$) compared to the low-romantic condition ($M = 1.71$, $SD = 1.26$, $t(32) = 3.10$, $p = .004$).

Results

Consistent with predictions, participants were more likely to choose even numbers as their favorite number in the high-romantic condition (56%), compared to the low-romantic condition (36%, $\chi^2 = 4.03$, $p = .04$). Furthermore, additional analyses indicate that the choice share of round (vs. precise) numbers and magnitude did not differ across conditions. Specifically, participants were not more likely to choose round

numbers as their favorite numbers in the high-romantic condition (6%), compared to the low-romantic condition (10%, $p > .46$). Participants also were not more likely to choose bigger numbers as their favorite numbers in the high-romantic condition ($M = 28.72$, $SD = 26.70$), compared to the low-romantic condition ($M = 36.08$, $SD = 30.03$, $p > .19$). These results suggest that the increased preference for even numbers compared to odd numbers was not driven by preference for the roundness or magnitude of numbers. Neither gender, age, nor relationship status interacted with independent variable ($ps > .30$).

Discussion

Study 2a found that romantic motives led to increased preference for even (vs. odd) numbers. Specifically, participants who mentally simulated a romantic scenario exhibited a stronger preference for even (vs. odd) numbers compared to those in the control condition. In addition, findings suggest that the effect is not a related to thoughts about any paired relationship, but is specific to mating. In terms of outcomes, the supplementary analyses suggested that the activation of romantic motives only influences participants' preference for even (vs. odd) numbers, but not for round (precise) or larger (small) numbers.

STUDY 2B: ROMANTIC MOTIVES & PREFERENCE FOR PRODUCTS WITH EVEN (VS. ODD) NUMERICAL PRODUCT ATTRIBUTES

Study 2b had three objectives. First, study 2b was conducted to test downstream implications of the proposed effect. Specifically, I tested whether romantic motives can influence people's evaluations of marketing communications featuring either even or odd

numerical information (e.g., product quantities and weights). Second, study 2b employed a between-subject manipulation of number type and assessed preference for even (vs. odd) numbers in isolation to provide a more conservative test of the effect and enhance internal validity. Third, this study also aimed to further demonstrate that the effect is unique to romantic relationships by contrasting against another non-romantic relationship (i.e., friendship) in the control condition. To this end, I asked participants in the control condition to imagine hanging out with a same-sex friend (Griskevicius et al. 2006; Monga and Gürhan-Canli 2012).

Method

Participants and Design. This study had a 2 (romantic motive: same-sex friendship vs. romantic partnership) $\times$ 2 (number: odd vs. even) $\times$ 3 (replicate) mixed design with the first two factors being manipulated between subjects. One hundred and twenty-three undergraduates (117 males; 19 to 30 years; $M = 19.99$, $SD = 1.34$) participated in this study in return for course credit.

Procedure. All participants were randomly assigned to either a high- or low-romantic condition and were asked to "read the scenario carefully and try your best to put yourself into the situation and imagine that it is actually happening." Romantic motives were primed via a guided visualization exercise that has been shown to successfully elicit strong romantic emotions and motivations in previous literature (Durante and Arsena 2015; Griskevicius et al. 2006, 2007, 2009; Li et al. 2012; Monga and Gürhan-Canli 2012; Sundie et al. 2011). Participants in the romantic condition were asked to imagine meeting someone desirable and spending a wonderful day and having dinner with that person (Durante and Arsena 2015). Specifically, participants first read the following:

"Imagined that you meet someone desirable on the university campus. You have spent a wonderful afternoon and a romantic evening with this person, including a candlelight dinner and a sweet kiss goodnight. Take a moment to think about how this experience would feel."

(At this point, participants were asked to write a few sentences about how they envision the situation and how they would feel.)

Next, participants were asked to imagine the following:

"Now, you think that this person may be a good long-term partner so you are anticipating going out on an "official" first date with this person. Take a moment to think about the first date with this person."

(At this point, participants were again asked to write a few sentences about how they envision the situation and how they would feel.)

In the low-romantic condition, participants were asked to imagine attending a concert with a same-sex friend, whereby neither condition involves any romantic connotations. (The full scenarios are presented in the Appendix A).

The scenario involving a same-sex friend followed a similar procedure with the scenarios in the romantic condition. Specifically, participants first read the following:

"Imagined that you are getting ready to go to a much-anticipated concert with a same-sex friend. But, you could not find the tickets during the night of the show. Take a moment to think about how this experience would feel."

(At this point, participants were asked to write a few sentences about how they envision the situation and how they would feel.)

Next, participants were asked to imagine the following:

"When the friend shows up with the tickets, both of you head off in a great mood anticipating a delightful musical experience. Take a moment to think about the experience with this person."

(At this point, participants were again asked to write a few sentences about how they envision the situation and how they would feel.)

After the priming task, participants were asked: "While envisioning the situation, to what extent did you feel romantic?" (1 = *Not At All Romantic*, 7 = *Extremely Romantic*). All participants then moved to a shopping scenario. Afterwards, participants were randomly assigned to either an odd- or even-number condition. In the odd-number condition, participants were asked to examine seven products that included odd numerical attributes: Cheese (2.25lb), Chocolates (17ea), and Flour (4.87lb). In the even-number condition, participants were asked to examine the same products that include even numerical attributes: Cheese (2.24lb), Chocolates (16ea), and Flour (4.86lb). After examining the given promotions, participants reported how likely they would be to buy each product (1 = *Not At All*, 9 = *Very Much*). Finally, participants responded to additional background questions including age, gender, and relationship status and were thanked.

Results

Manipulation Check. As expected, participants felt more romantic in the high-romantic ($M = 4.71$, $SD = 1.60$) compared to the low-romantic condition ($M = 1.59$, $SD = 1.40$, $p < .001$). There was no main effect of number type nor romantic motive by number type interaction on perceived romantic motive ($ps > .34$).

Hypothesis Tests. A repeated measures ANOVA on participants' purchase intention revealed a significant main effect of romantic motive ($F(1, 119) = 4.06$, $p < .05$), indicating that participants' purchase intention increased in the high-romantic condition. Importantly, there was a significant two-way interaction of romantic motive and number type on purchase intention ($F(1, 119) = 3.94$, $p < .05$; see fig. 6). Specifically, replicating previous findings, when the quantities and prices of products were even numbers, participants reported greater purchase intention in the high-romantic ($M = 3.12$, $SD = 1.01$) compared to the low-romantic condition ($M = 2.41$, $SD = .86$; $F(1, 119) = 6.24$, $p = .01$). However, when the quantities and prices of products were odd numbers, participants did not reported greater purchase intention in the high-romantic ($M = 2.60$, $SD = .98$) compared to the low-romantic condition ($M = 2.6$, $SD = .88$; $F(1, 119) = .001$, $p > .98$). No other effect was significant ($ps > .27$). Neither gender, age, nor relationship status interacted with independent variable ($ps > .27$).

FIGURE 6: PURCHASE INTENTION AS A FUNCTION OF ROMANTIC MOTIVE AND NUMERICAL PARITY (STUDY 2B)
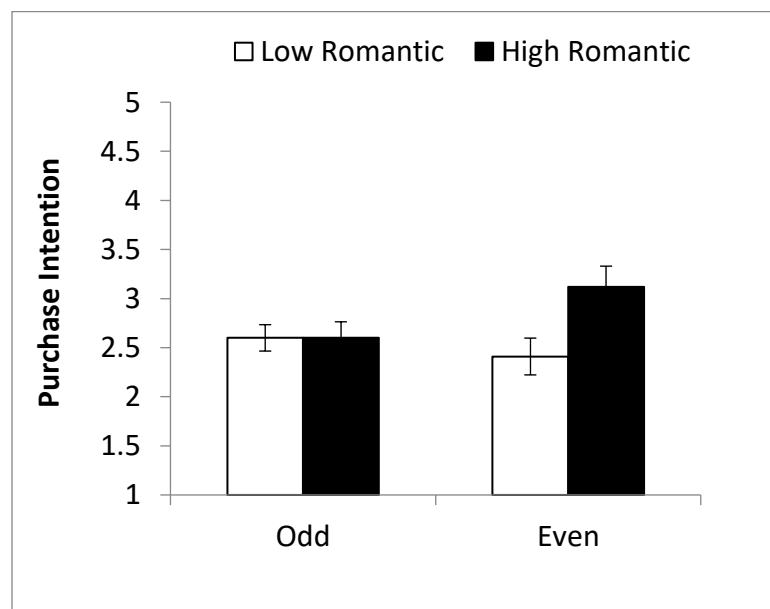
Discussion

Study 2b demonstrated the implications of the proposed effect. The activation of romantic motives increased participants' purchase intention when product attributes (weight and quantities) are presented in even (vs. odd) numbers. More specifically, participants who mentally simulated a romantic scenario exhibited a stronger preference for marketing communications containing even numbers compared to those in the control condition. But, preference for marketing communications containing odd numbers was not altered by a romantic scenario. By including another non-romantic relationship (i.e., hanging out with a same-sex friend), study 2b further supports the idea that preference for even versus odd numbers is specific to romantic relationship motives and not motivations related to other types of relationship formation.

STUDY 3: THE IMPORTANCE OF A ROMANTIC PAIR-BOND

I have argued that the activation of romantic motives increases preference for even numbers, but not for odd numbers, because thoughts about mating bring the importance of a romantic partnership to the fore. Therefore, study 3 was designed to test this underlying mechanism.

Method

Participants and Design. This study had a 2 (romantic motive: low vs. high) $\times$ 2 (number: odd vs. even) $\times$ 6 (replicate) mixed design with the first two factors being manipulated between subjects. One hundred and twenty-three undergraduates (68 males; 18 to 25 years; $M = 20.01$, $SD = 1.07$) participated in this study in return for the credits.

Procedure. Similar to study 2b, I asked participants in the romantic condition to imagine meeting someone desirable and spending the day and having dinner with that person (Durante and Arsena 2015). Participants in the low-romantic condition were asked to imagine doing laundry that does not involve any romantic connotations. (The full scenarios are presented in the Appendix A). After the priming task, participants were asked: "While envisioning the situation, to what extent did you feel romantic?" (1 = *Not At All Romantic*, 7 = *Extremely Romantic*). All participants then moved to a shopping scenario. In the odd-number condition, participants were asked to examine six products that included odd numerical attributes: Cheese (2.25lb), Chocolates (17ea), Olive Oil (23oz), Jacket ($68.83), Sweater ($46.63), and Bag ($46.87). In the even-number condition, participants were asked to examine the same products that included even numerical attributes: Cheese (2.24lb), Chocolates (16ea), Olive Oil (22oz), Jacket ($68.82), Sweater ($46.62), and Bag ($46.86). After examining the given promotions, participants reported how likely they would be to buy each product (1 = *Not At All*, 5 = *Very Much*).

To assess the perceived importance of forming a romantic pair-bond, participants indicated the extent to which they agree or disagree with three statements: "Compared to other people I know, it is more important to me to find love," "Finding love is the most important thing in life," and "It is important for me to find a romantic partner," (1 = *Strongly Disagree*, 7 = *Strongly Agree*). The three items were aggregated to form a single index of the importance of forming a romantic pair-bond ($\alpha = .80$). Finally, participants responded to additional background questions including age, gender, and relationship status and were thanked.

Results

Manipulation Check. The results of a 2×2 ANOVA on perceived romantic motive revealed that the manipulation worked as intended. Specifically, participants felt more romantic in the high-romantic ($M = 5.36$, $SD = 1.03$) compared to the low-romantic condition ($M = 1.69$, $SD = 1.20$, $p < .001$). There was no main effect of number type nor romantic motive by number type interaction on perceived romantic motive ($Fs < 1$).

Number Preference. A repeated measures ANOVA on participants' purchase intention revealed two significant effects. First, the main effect of number type ($p < .02$) indicates that participants' purchase intention was higher in the even number condition ($M = 2.96$, $SD = .83$) than that in the odd number condition ($M = 2.66$, $SD = .60$). More importantly, this main effect was qualified by a significant two-way interaction ($F(1, 119) = 4.16$, $p = .04$). Specifically, replicating previous findings, when the quantities and prices of products were even numbers, participants reported greater purchase intention in the high-romantic ($M = 3.18$, $SD = .79$) compared to the low-romantic condition ($M = 2.77$, $SD = .82$; $F(1, 119) = 4.99$, $p < .03$). But when the quantities and prices of products were odd numbers, no significant difference was observed between the high-romantic ($M = 2.60$, $SD = .60$) and low-romantic conditions ($M = 2.72$, $SD = .61$; $F(1, 119) = .43$, $p > .51$). There was no main effect of romantic motive on participants' purchase intention ($p > .27$). Neither gender, age, nor relationship status interacted with independent variable ($ps > .26$).

Importance of Forming a Romantic Pair-Bond. There was no main effect of number type nor romantic motive by number type interaction on perceived importance of forming a romantic pair-bond ($Fs < 1$). As expected, there was only a main effect of

romantic motive such that participants reported greater importance of forming a romantic pair-bond in the high-romantic (M = 4.66, SD = 1.25) compared to the low-romantic condition (M = 4.16, SD = 1.58; $F(1, 119)$ = 3.91, p = .05).

Mediation Analyses. I propose that the effect of condition (low- vs. high-romantic motive) on increased preference for even numbers occurs because the activation of romantic motive makes the perceived importance of forming a romantic pair-bond more salient. To test this underlying process, I assessed the moderated mediation model whereby romantic motive serves as an independent variable, the number type as a moderator, importance of forming a romantic pair-bond as the mediator, and preference for numbers as the dependent variable (Process Model 14; Hayes, 2008). The indirect effect of the interaction between mating motive and number type was supported (ab = .04, 95% CI: .01 to .15). The indirect effect through importance of forming a romantic pair-bond was significant in the even number condition (ab = .03, 95% *CI*: .01 to .10) but not in the odd number condition (ab = -.01, 95% *CI*: -.08 to .02). In summary, these results indicate that romantic cues increase preference for even (vs. odd) numbers because participants ascribe greater importance to securing a romantic relationship in such conditions.

Discussion

Study 3 replicates and extends the previous studies by providing process evidence for this effect. Study 3 found that the impact of romantic motives on parity preferences is statistically mediated by perceived importance of forming a romantic pair-bond when mating motives are activated. The final two studies examine important boundary conditions of this effect.

STUDY 4: THE ROLE OF INDIVIDUAL DIFFERENCES IN MATING SUCCESS

Study 4 had several objectives. First, I sought to enhance the generalizability of this effect by using a different dependent measure. Specifically, I asked participants to make numerical estimates to see whether their preference for using even (vs. odd) numbers varied. Second, while I have shown that these findings are not attributable to work relationships (study 2a) and friendship (study 2b), this study further ruled out kinship as another alternative account. In addition, study 4 sought to test whether romantic motives increase the accessibility of even numbers more strongly for those who feel that the goal of acquiring a mate requires more effort to achieve. Conversely, the proposed effect should be weakened among individuals who believe that a romantic partner is easy to find.

Method

Participants and Design. This study used a 2 (romantic motive: kindship vs. romantic partnership) × 2 (mating easiness: low vs. high) between-subjects design. One hundred and sixteen undergraduates (58 males; 18 to 37 years; $M = 21.38$, $SD = 3.08$) participated in this study in return for the credits.

Procedure. Similar to earlier studies, I asked participants in the romantic condition to imagine meeting someone desirable and spending a wonderful day and having dinner with that person. In the low-romantic condition, participants were asked to imagine attending a concert with a family member (similar to study 2b) that does not involve any romantic connotations. After the priming task, participants were asked: "While envisioning the situation, to what extent did you feel romantic?" (1 = *Not At All*

Romantic, 7 = *Extremely Romantic*). Next, participants were asked to estimate two

different quantities (i.e., the quantity of a glass of water in ounces and the length of a

pen). Afterwards, to assess perceived easiness of finding a romantic partner, participants

indicated the extent to which they agree or disagree with three statements: "I expect that

it will be relatively easy to find a romantic partner who has all of the qualities that I

want," "There are plenty of romantic partners available to me who will be able to give me

the life that I want for myself," and "If I were trying to attract a boyfriend/girlfriend right

now, I would expect that it would be very easy for me," (1 = *Strongly Disagree*, 7 =

Strongly Agree). The three items were aggregated to form a single index of the perceived

easiness of finding a romantic partner (α = .77). Finally, participants responded to

additional background questions including age, gender, and relationship status and were

thanked.

Results

    Manipulation Check. The manipulation check indicated that the manipulation was

effective, showing that participants felt more romantic in the high-romantic (M = 4.9, SD

= 1.79) compared to the low-romantic condition (M = 2.23, SD = 1.78, p < .001).

    Number Preference. If participants' estimates were even numbers, I coded them

as "1"; otherwise "0". I summed up these scores to create a single index of preference for

even (vs. odd) numbers, where higher numbers indicate greater preference for even (vs.

odd) numbers (0 = did not report even numbers at all, 2 = reported only even numbers). I

performed a regression using romantic motive (low = -1, high = 1), and mating easiness

(mean-centered), and their interactions as the independent variables, and numerical

preference as the dependent variable. As expected, there was a significant two-way

interaction of romantic motive and mating easiness on numerical preference ($\beta = -.08$, $t(112) = -2.38$, $p < .02$; see fig. 7). At low levels of mating easiness (1 standard deviation below the mean), in support of the prediction, participants were more likely to use even numbers in the high-romantic condition ($M = 1.5$) compared to the low-romantic condition ($M = 1.11$, $\beta = .20$, $t(172) = 2.49$, $p = .01$). However, at high levels of mating easiness (1 standard deviation above the mean), participants were not more likely to use even numbers in the high-romantic condition ($M = 1.31$) compared to the low-romantic condition ($M = 1.45$, $\beta = -.07$, $t(112) = -.90$, $p > .37$). The transition points of the Johnson–Neyman significance regions indicate that a mating easiness score lower than or equal to 2.95 (31.9%) is the point of transition for the effect of romantic primes on the preference for even (vs. odd) numbers ($\beta = .12$, $t(112) = -1.98$; $p = .05$). No other effect was significant ($ps > .26$). Furthermore, additional analyses indicate that preferences for round (vs. precise) numbers and magnitude did not differ across conditions ($ps > .14$), which again suggests that the increased preference for even numbers compared to odd numbers was not driven by preference for the roundness or magnitude of numbers. Neither gender, age, nor relationship status interacted with independent variable ($ps > .06$).

Discussion

Study 4 provides additional support for the theorizing in two ways. First, it replicated previous findings using a different dependent measure and control condition. In addition, this study tests a theory-based moderating role of this effect by measuring perceptions of easiness of finding a romantic partner. These findings suggest that in the high-romantic condition, the elevated romantic motive increased the accessibility of even

numbers, but this effect is substantially weakened among people who believe that their mating goals are easy to achieve.

FIGURE 7: PARITY PREFERENCE AS A FUNCTION OF ROMANTIC MOTIVE AND MATING EASINESS (STUDY 4)
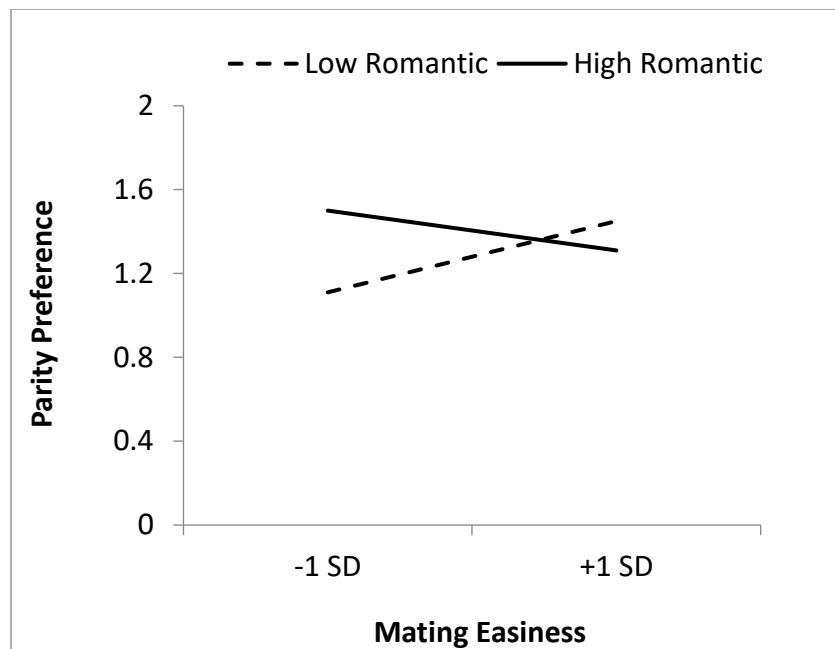
STUDY 5: THE ROLE OF INDIVIDUAL DIFFERENCES IN MATING STRATEGY (MONOGAMY VERSUS POLYGAMY)

Study 5 aimed to test another theoretically-derived boundary condition. The effect of romantic motives on numerical preference is predicated on the assumption that people's mating goal is achieved when they secure a relationship with one partner (Buss and Schmitt 1993; Street 2002). Therefore, I suggest that the effect will be weakened among individuals who prefer polygamy (having more than one partner at the same time). Second, I extended the previous findings by manipulating mating motives using a different approach—watching a romantic movie.

Method

 Participants and Design. This study used a 2 (romantic motive: low vs. high) × 2 (number: odd vs. even) × 4 (replicate) mixed design and measured polygamy preference. One hundred and fifty-two (54 males; 18 to 50 years; *M* = 22.43, *SD* = 5.28) undergraduates participated in this study in return for the credits.

 Procedure. In the high-romantic condition, participants were asked to watch a scene from a romantic movie (*The Best of Me*, 2014). In the low-romantic condition, participants were asked to watch an equally timed clip from a science documentary (*The Earth's History*, 2014). All participants then moved to a shopping scenario. Afterwards, participants were randomly assigned to either an odd- or even-number condition. In the odd-number condition, participants were asked to examine four products that included odd numerical attributes: T-shirt ($22.45), Jacket ($68.83), Sweater ($46.63), and Shoes ($68.25). In the even-number condition, participants were asked to examine the same products that include even numerical attributes: T-shirt ($22.44), Jacket ($68.82), Sweater ($46.62), and Shoes ($68.24). Participants reported how likely they would be to buy each product (1 = *Not At All*, 9 = *Very Much*). Then, participants directly indicated their preference for a polyamorous relationship: "Would you engage in a polyamorous relationship?" (1 = *Absolutely Not*, 4 = *Absolutely*). Finally, participants were asked: "While watching the previous video, to what extent did you feel romantic?" (1 = *Not At All Romantic*, 7 = *Extremely Romantic*). Participants also report their preference for the movie: "Did you like the movie?" (1 = *Not At All*, 7 = *Very Much*). Finally, participants responded to additional background questions including age, gender, and relationship status and were thanked.

Results

Manipulation Check. Participants felt more romantic in the high-romantic ($M =$ 4.71, $SD = 1.98$) compared to the low-romantic condition ($M = 1.62$, $SD = 1.06$, $p <$ .001). There was no significant effect on their preference for the movie ($p > .54$).

Hypothesis Tests. I performed a regression using romantic motive (low = -1, high =1), number type (odd = -1, even = 1), and polygamy preference (mean-centered), and their interactions as the independent variables, and purchase intention as the dependent variable. As expected, there was a significant three-way interaction ($\beta = -.93$, $t(144) = -$ 2.15, $p = .03$; see fig. 8). To explore the meaning of this 3-way interaction, I conducted a spotlight analysis. That is, I examined the effect of romantic motives and number type at one standard deviation below and above the mean of polygamy preference. At low levels of polygamy preference (1 standard deviation below the mean), there was a significant two-way interaction of romantic motives and number type on purchase intention (β = .996, $t(144) = 2.19$, $p = .03$). Specifically, participants' purchase intention of products involving even numerical attributes was greater in the high-romantic ($M = 3.49$) compared to the low-romantic condition ($M = 3.14$; $\beta = .35$, $t(144) = 2.53$, $p = .01$). But when products attribute values were in odd numbers, participants' purchase intention was not different between the high-romantic ($M = 3.20$) and low-romantic conditions ($M =$ 3.64; $\beta = -.44$, $t(144) = -.54$, $p > .59$). Collectively, these results replicated previous findings. However, at high levels of polygamy preference (1 standard deviation above the mean), there was no significant two-way interaction ($p > .44$). The transition points of the Johnson–Neyman significance regions indicate that a polygamy preference score lower than or equal to 1.21 (56.58 %) is the point of transition for the effect of romantic primes

on the preference for even numbers ($t(144) = 1.98$; $p = .05$). No other effect was significant ($ps > .16$). Neither gender, age, nor relationship status interacted with independent variable ($ps > .07$).

FIGURE 8: PURCHASE INTENTION AS A FUNCTION OF ROMANTIC MOTIVE, NUMERICAL PARITY, AND POLYGAMY PREFERENCE (STUDY 5)
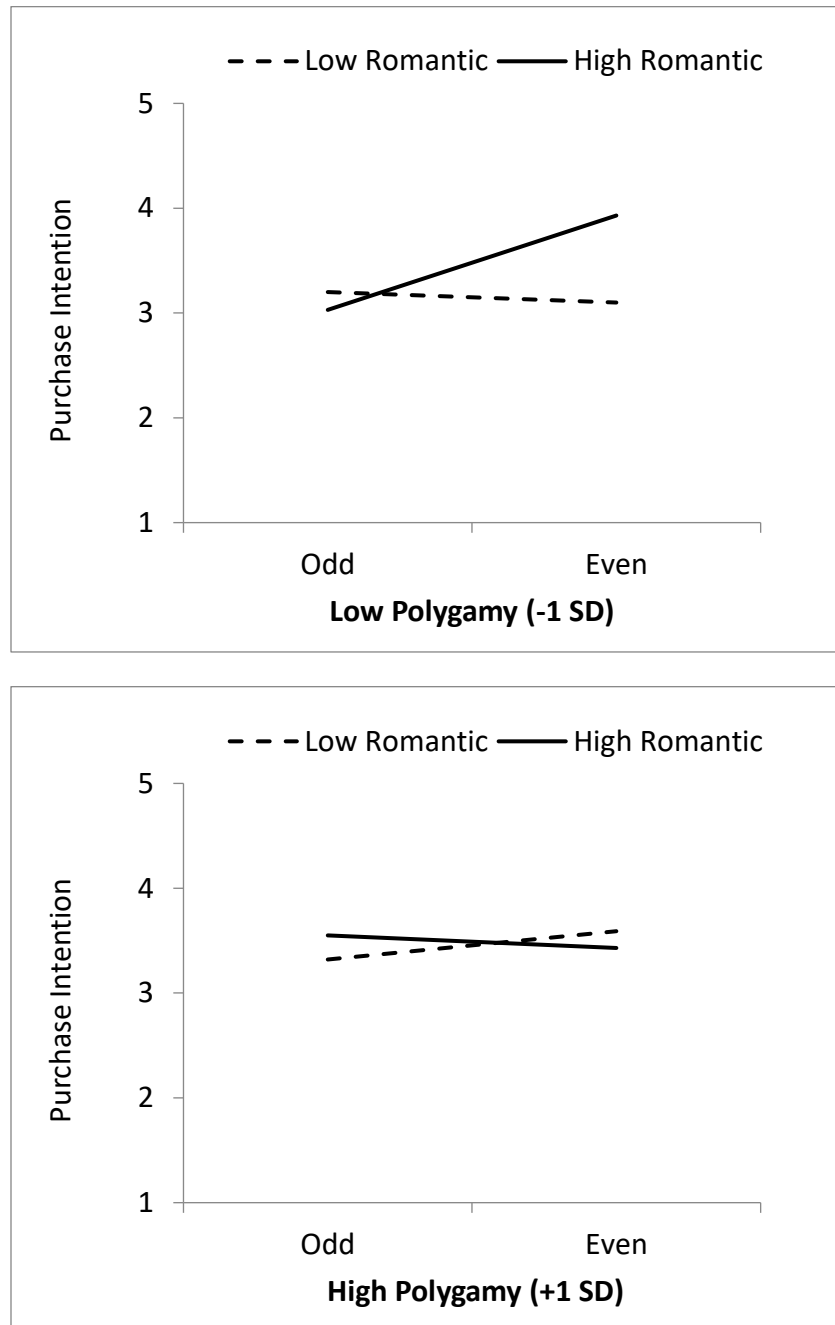
Discussion

By showing that preference for polygamy (i.e., non-monogamy) decreases the effect of romantic motives on preference for even numbers, study 5 provides further support for the conceptual model and the motivation-based account. Results are consistent with the idea that the effects are likely to be more pronounced among people who prefer monogamy (two people in a committed relationship), yet dampened among people who prefer polygamy. Study 5 also improves the generalizability of the effect by using a different method to induce romantic motives – watching a romantic movie.

GENERAL DISCUSSION

In six studies, I examined whether and how the activation of romantic motives influence consumer responses to numerical information. Building on past literature on numerical cognition, goal pursuit, and romantic motives, I hypothesized and found that participants with salient romantic motives exhibited a stronger preference for the number "2" and, subsequently, even (vs. odd) numbers and marketing offerings featuring even (vs. odd) numbers. It is noteworthy that the present findings were replicated using multiple dependent measures (e.g., direct likability rating, choice, purchase intention, etc.), product categories (e.g., t-shirt, chocolates, water, cheese, olive oil, beef, flour, jacket, sweater, shoes, and bag, etc.), units (e.g., quantity, volume, weight, and price, etc.), and manipulations (e.g., exposure to an attractive person, a guided visualization exercise, watching a romantic movie, and gift giving for a romantic partner etc.). Thus, the effect I demonstrate appears to be robust and generalizable. In addition, these results show that the effect is unique to a romantic relationship, rather than other social

relationships such as work relationships, friendship, or kinship. In addition to identifying

an underlying process driving this effect (mating motivations), I also demonstrated

important boundary conditions (i.e., mating easiness and monogamy preference), that

provide further support for a motivation-based account.

The current research adds to the growing literature on numerical cognition in two

ways. First, previous research in this area has typically employed a cognitive perspective,

focusing on mental processes such as mental representation (Cai et al. 2012), attention

(Coulter and Coulter 2007), metacognition (Thomas and Morwitz 2009; Thomas et al.

2010), and memory (Childers and Viswanathan 2000). To the best of my knowledge, the

present work is perhaps the first to introduce a motivational perspective to the field.

Specifically, I investigated how humans' fundamental desire to form romantic

relationships influences their preference for even (vs. odd) numbers.

Second, I also expand this literature by examining how people respond to parity, a

very common numerical property that has received strikingly little attention in

comparison to other properties such as precision versus roundness (Gunasti and Ozcan

2016; Janiszewski and Uy 2008; Mason et al. 2013; Wadhwa and Zhang 2015). There has

been growing evidence that numerical information expresses not only magnitude

information such as size, price, weight, and so forth, but also different psychological

meanings (Battig and Spera 1962; Bellos 2015; Knapp and Chen 1964). For example,

individuals often infer that the communicators are more confident, knowledgeable, and

credible when they present numbers more precisely (Jerez-Fernandez et al. 2014; Zhang

and Schwarz 2013). Similarly, building on the notion that round numbers signal

psychological completion, Yan and Pena-Marin (2017) demonstrated that negotiators are

more likely to accept round offers than comparable precise offers. Thus the current work

expands this line of inquiry by identifying parity as another source of psychological

meaning that is carried by numbers. Because the same number may be connected to

multiple numerical properties (e.g., 30 is a round and even number), future research is

needed to investigate the conditions under which people are likely to infer a particular

meaning.

The current research also contributes to an emerging research stream that

examines how mating motives influence consumer behavior (Dahl et al. 2009). Although

mating is an integral part of one's life and romantic cues are seemingly ubiquitous, only

recently have researchers begun to examine their influences in consumer behavior

contexts (Durante et al. 2011; Durante and Arsena 2015; Griskevicius et al. 2007; Hill et

al. 2012; Monga and Gürhan-Canli 2012; Sundie et al. 2011). To the best of my

knowledge, the current research is the first to examine this motive in a numerical context.

By focusing on the shifting value of numbers depending on its parity (i.e., whether it is an

odd or even number) beyond the objective magnitude, this research adds to our

understanding of the influences of mating motives on consumer behavior.

Implications

Numerical information is ubiquitous in marketing. Marketers thus are interested

in understanding how to communicate numerical information. The current research

suggests that marketers may consider using romantic cues to elicit a more favorable

response to their prices and other marketing stimuli containing numbers. For instance,

commercials using even rather than odd numbers can help improve attitudes and purchase

intention, particularly when the targeted customers are likely to possess currently active

mating goals. Similarly, marketers may use more even numbers than odd numbers in promotional campaigns for products used in mating contexts (e.g., lingerie, cologne), and on dating websites or around Valentine's Day.

Our findings suggest that mere changes in the consumption settings, such as changing purchase quantities, can result in important behavioral consequences when consumers' romantic motives are salient. Importantly, the current research found that the influences of romantic motives on number preferences replicated regardless of the participant's gender, age, or relationship status. Given such a strong link between romantic motives and evenness, marketers may increase sales by evoking romantic motives and using even numbers in their promotional material.

Limitation and Future Directions

The current research has demonstrated the downstream effect of romantic motives on preference for even (vs. odd) numbers in varied marketing contexts. However, I did not examine whether romantic motives can indeed alter consumers' real consumption behaviors. Future research may wish to examine this effect using actual purchase behavior. For example, researchers may examine whether romantic cues, such as employing attractive opposite-sex individuals as a clerk, can increase product sales when the target product information (e.g., product code or price, weight, volume, and quantities) contains even (vs. odd) numbers. It is also worthwhile to test whether using even (vs. odd) numbers can increase consumer attitudes toward romantic products (e.g., Valentine's Day roses, a heart-shaped chocolate cake, or an engagement ring), in comparison to non-romantic products.

Given the motivation-based account, it is reasonable to assume that being involved in a committed relationship (i.e., having attained the goal of securing a romantic partner) should weaken the proposed effect. However, the current work did not find that relationship status moderated the effect of romantic motives on preference for even numbers. There are two reasons why this may have occurred. First, many of the participants in the current research were undergraduate students who tend to be young and single, or in partnerships that have only been established for a short period of time. University students also have a large pool of alternative mates to choose from and mating goals are still likely to be active even for those involved with one partner. Second, and relatedly, there is a high degree of variance in relationship satisfaction among partnered individuals, whereby mating goals may still be relevant and easily accessible for people who are less satisfied with their current partnership (Durante and Li 2009; Durante et al. 2016). Future research with a more diverse sample of married and single participants is warranted.

I suggest that the effect of romantic motives on consumers' increased preferences for even (vs. odd) numbers occurs because of an increased desire to obtain a romantic partnership. Therefore, the proposed effect is likely to be activated regardless of gender. However, prior literature has demonstrated considerable gender differences in behavioral changes derived from a romantic motivation (D Dahl et al. 2009; Monga and Gürhan-Canl 2012). For example, males are generally more attentive to sexual cues such as photographs of attractive women (Van den Bergh, Dewitte, and Warlop, 2008; Wilson and Daly 2004), while women are more attentive to men's financial status (Buss and Barnes 1986; Li et al. 2002). Therefore, future research may examine whether such

different cues indeed show gender differences in changes in numerical judgment and decision-making. Given that a long-term mating mind-set (vs. short-term mating mind-set) has a more powerful impact on women's judgment and decision-making (Griskevicius et al. 2006; Kenrick et al. 1990), future research may also test whether the effect of romantic motives on numerical preference replicates in both short and long-term mating contexts.

Conclusion

Six experiments found that romantic cues lead people to prefer the number "2" and even numbers and marketing offerings featuring even (vs. odd) numbers. This research contributes to our understanding of numerical cognition, goal pursuit, and the influence of mating motives on consumer preferences. Moreover, the present work enriches numerical cognition research by examining parity (even/odd), a common numerical property that has received little attention. Finally, this research adopted a fundamental human motives approach to study consumer decision-making and highlights the importance of this framework as a prescriptive tool to guide research.

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APPENDIX A

THE SCENARIO OF MEETING A WOMAN USED IN STUDY 1 OF ESSAY 2

"Imagine that you are in a relationship. You and your date are at a party. While you are on your way back from the restroom, someone remarks at how beautiful your date is. When you look over toward your date you see that she is smiling at you and gives you a wink."

(At this point, participants were asked to write a few sentences about how they envision the situation and how they would feel.)

Next, participants were asked to imagine the following:

"Soon, you make your way back to your date and realize just how beautiful she truly is. When you sit down you surprise your date with her favorite drink. Your hand your date the drink and you snuggle in beside her on the couch. You put your arms around her and feel her warm body lean in to yours."

(At this point, participants were again asked to write a few sentences about how they envision the situation and how they would feel.)

"As you are sipping your drink next to your date, you notice some of the people around you looking your way and smiling. One man looks to you an whispers "lucky man.""

(At this point, participants were again asked to write a few sentences about how they envision the situation and how they would feel.)

THE SCENARIO OF MEETING A MAN USED IN STUDY 1 OF ESSAY 2

"Imagine that you are in a relationship. You and your date are at a party. While you are on your way back from the restroom, someone remarks at how handsome your date is. When you look over toward your date you see that he is smiling at you and gives you a wink."

(At this point, participants were asked to write a few sentences about how they envision the situation and how they would feel.)

Next, participants were asked to imagine the following:

"Soon, you make your way back to your date and realize just how handsome truly is. When you sit down your date surprises you with your favorite drink he brought to the party just for you. Your date hands you the drink and you snuggle in beside him on the couch as he puts his strong arms around you."

(At this point, participants were again asked to write a few sentences about how they envision the situation and how they would feel.)

"As you are sipping your drink next to your date, you notice some of the people around you looking your way and smiling. One woman looks to you an whispers "lucky girl.""

(At this point, participants were again asked to write a few sentences about how they envision the situation and how they would feel.)

THE SCENARIO OF DOING LAUNDRY USED IN STUDY 1 OF ESSAY 2

"Imagine that today you need to do laundry. You fill up the washer with a full load, pour the detergent into the machine, and check the setting. After making sure that you have the right setting, you turn on the washer."

(At this point, participants were asked to write a few sentences about how they envision the situation and how they would feel.)

Next, participants were asked to imagine the following:

"After the washer finishes with your load, you take each piece of clothing, shake it out, and put it into the dryer. You look at the dial on the dryer and set it to the correct time and setting. Finally, you turn on the dryer."

(At this point, participants were again asked to write a few sentences about how they envision the situation and how they would feel.)

"You open the dryer and put your hand inside to make sure that everything is dry—it is. You take the clothes out of the dryer and put them into a basket. You go back to the dryer and check to make sure that there is nothing left—there isn't"

(At this point, participants were again asked to write a few sentences about how they envision the situation and how they would feel.)

THE SCENARIO OF MEETING A ROMANTIC PARTNER USED IN STUDIES 2B, 3, AND 4 OF ESSAY 2

"Imagined that you meet someone desirable on the university campus. You have spent a wonderful afternoon and a romantic evening with this person, including a candlelight dinner and a sweet kiss goodnight. Take a moment to think about how this experience would feel."

(At this point, participants were asked to write a few sentences about how they envision the situation and how they would feel.)

Next, participants were asked to imagine the following:

"Now, you think that this person may be a good long-term partner so you are anticipating going out on an "official" first date with this person. Take a moment to think about the first date with this person."

(At this point, participants were again asked to write a few sentences about how they envision the situation and how they would feel.)

THE SCENARIO INVOLVING A SAME-SEX FRIEND USED IN STUDY 2B OF
ESSAY 2

"Imagined that you are getting ready to go to a much-anticipated concert with a same-sex friend. But, you could not find the tickets during the night of the show. Take a moment to think about how this experience would feel."

(At this point, participants were asked to write a few sentences about how they envision the situation and how they would feel.)

Next, participants were asked to imagine the following:

"When the friend shows up with the tickets, both of you head off in a great mood anticipating a delightful musical experience. Take a moment to think about the experience with this person."

(At this point, participants were again asked to write a few sentences about how they envision the situation and how they would feel.)

THE SCENARIO OF DOING LAUNDRY USED IN STUDY 3 OF ESSAY 2

"Imagine that today you need to do laundry. You fill up the washer with a full load, pour the detergent into the machine, and check the setting. After making sure that you have the right setting, you turn on the washer. Take a moment to think about how this experience would feel."

(At this point, participants were asked to write a few sentences about how they envision the situation and how they would feel.)

Next, participants were asked to imagine the following:

"After the washer finishes with your load, you take each piece of clothing, shake it out, and put it into the dryer. You look at the dial on the dryer and set it to the correct time and setting. Finally, you turn on the dryer. Take a moment to think about how this experience would feel."

(At this point, participants were again asked to write a few sentences about how they envision the situation and how they would feel.)

THE SCENARIO INVOLVING A FAMILY MEMBER USED IN STUDY 4 OF
ESSAY 2

"Imagined that you are getting ready to go to a much-anticipated concert with a member of your family. But, you could not find the tickets during the night of the show. Take a moment to think about how this experience would feel."

(At this point, participants were asked to write a few sentences about how they envision the situation and how they would feel.)

Next, participants were asked to imagine the following:

"As the member of your family shows up with the tickets, both of you head off in a great mood anticipating a delightful musical experience. Take a moment to think about the experience with this person."

(At this point, participants were again asked to write a few sentences about how they envision the situation and how they would feel.)