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Author(s): Yangjie Gu, Simona Botti, and David Faro

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Turning the Page: The Impact of Choice Closure on Satisfaction

YANGJIE GU
SIMONA BOTTI
DAVID FARO

After having made a purchase decision, consumers often revisit their choice and ponder forgone alternatives. This tendency can lower satisfaction with the selected alternative, especially when choices are difficult. We introduce the concept of “choice closure”—defined as the psychological process by which consumers come to perceive a decision to be final—and show that specific physical acts that are metaphorically associated with the concept of closure (such as covering or turning a page on the rejected alternatives) trigger choice closure in the context of difficult choices. Four studies show that performing acts of closure inhibits consumers’ propensity to reconsider their decision process and to engage in unfavorable comparisons between the chosen and the forgone options, resulting in greater satisfaction with the outcome of choices made from large sets. These findings suggest that subtle cues, which do not alter the actual choice context, can improve satisfaction with a difficult decision.

In the movie *It’s Complicated*, Meryl Streep’s character Jane is trying to commit to her decision to start a serious romantic relationship with Adam after her divorce. Despite having chosen her new partner, she keeps reconsidering her ex-husband Jake, even meeting him for secret dates. In one scene, she is shown baking a luscious chocolate cake for another such date but, after several hours of being late, Jake fails to show up. In an act that symbolizes her resolution

to break ties with Jake and start a new life with Adam, Jane covers the cake with a lid and walks away.

We refer to the psychological process by which decision makers come to perceive a decision to be complete and settled as “choice closure.” We show that choice closure can influence consumers’ satisfaction with the decision outcome and that physical acts of closure of the sort featured in the movie scene may not only reflect people’s resolve to seal off a difficult decision but also enable the resolution of that difficult decision.

Yangjie Gu is a PhD candidate, London Business School, Regent’s Park, London NW1 4SA, UK (ygu.phd2008@london.edu). Simona Botti is London Business School term associate professor of marketing, London Business School, Regent’s Park, London NW1 4SA, UK (sbotti@london.edu). David Faro is assistant professor of marketing, London Business School, Regent’s Park, London NW1 4SA, UK (dfaro@london.edu). The authors thank the Centre for Marketing at London Business School for financial support, and Zareen Choudhury, Monika Heller, and Nasima Kaker for their assistance in the data collection. The authors also thank Dawn Iacobucci, Derek Rucker, and Irene Scopelliti for their help with data analyses, and Jane Ebert, Ann McGill, Ena Inesi, and Nader Tavassoli for their comments on previous drafts. Finally, the authors are grateful to the editor, associate editor, and three reviewers for their thoughtful guidance. For more information about data analyses and measurements, please refer to the web appendix in the online version of this article.

We investigate choice closure in the context of a specific type of difficult choice: a choice made from an extensive set (Iyengar and Lepper 2000). Research on choice overload has shown that an increase in the number of options renders decisions more complex and lowers the attractiveness of the final outcome relative to the alternatives (Brenner, Rottenstreich, and Sood 1999; Carmon, Wertenbroch, and Zeelenberg 2003). We demonstrate that, under certain conditions, physical acts of closure can signal to consumers that their difficult decision is complete and should not be revisited, thus triggering choice closure. By inhibiting consumers from reassessing their decision, choice closure limits unfavorable comparisons between the chosen and the forgone options and results in greater satisfaction with an outcome selected from an extensive set.

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In the following sections, we introduce the concept of choice closure and motivate our hypotheses. In four studies we then demonstrate that choice closure, facilitated by dif-

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ferent physical acts of closure, enhances satisfaction with the outcome of difficult choices. We also provide evidence for the underlying process driving this effect and identify the critical elements of physical acts that can effectively trigger choice closure. Finally, we discuss theoretical and practical implications.

CHOICE CLOSURE

Most decisions require consumers to compare alternatives in order to identify the option that best meets their preferences (Bettman, Luce, and Payne 1998). After a choice is made, the decision process involving option comparisons is complete, and the preferred option is usually consumed separately from the rejected alternatives (Hsee et al. 1999).

Research has shown, however, that despite having made their choice, consumers do not always deem the decision phase complete. For example, decision makers feel post-choice regret as they continue comparing the chosen and the forgone options while imagining what their present situation would be like had they chosen differently (Bell 1982; Zeelenberg 1999). Similarly, decision makers who were forced to give up alternatives they grew attached to during the decision making reevaluate these alternatives as relatively more attractive after the choice than before it (Carmon et al. 2003).

The common experiences of post-choice regret and option attachment suggest that consumers tend to revert to the decision phase after having made their choice. We refer to choice closure as the psychological process through which consumers overcome this propensity, perceive a decision as finished and resolved, and limit the extent to which they reassess the chosen alternative relative to the forgone options. Therefore, in our conceptualization the choice-closure process entails two interrelated elements: a sense that the decision is complete and an associated inhibition from engaging in the comparisons involved in this decision.

The concept of choice closure is based on that of psychological closure, defined as “the sense that a life experience is complete, that is, a feeling of ‘pastness’ when recollecting a life event” (Beike, Adams, and Wirth-Beaumont 2007, 375; Beike, Markman, and Karadogan 2009; Beike and Wirth-Beaumont 2005). Psychological closure is related to choice closure in that it refers to the sense that a past event is resolved. However, psychological closure refers broadly to memory of life experiences and works through holding back the emotional details aroused by life events. In contrast, choice closure relates specifically to decision-making processes; rather than making the emotional details of a decision less accessible, it deters further comparisons between the chosen and the forgone options once a decision has been made.

PHYSICAL ACTS AND CHOICE CLOSURE

In the opening example we suggested that the act of putting a lid on the cake Jane had baked for her ex-husband indicated her resolve to end her affair with him. We propose

that similar acts of closure that involve symbolically encapsulating and sealing off a past decision not only may be spontaneous behavioral manifestations of an intention to settle on a choice but may also trigger choice closure. Specifically, we predict that acts of closure, such as covering rejected options or turning the page on these options, can signal to oneself that one’s decision is final and that the selected option should no longer be compared with the forgone ones.

The rationale for this prediction is based on research on metaphorical thinking showing that people grasp and experience abstract concepts through physical experiences. To do so, they rely on what they know about a familiar bodily and sensory domain to reason about, interpret, and evaluate a less familiar immaterial domain (Johnson 2007; Lakoff and Johnson 1980). These early associations between abstract concept and ordinary interactions with the physical world provide individuals with a “cognitive scaffolding” (Bargh 2006; Landau, Meier, and Keefer 2010). At a later stage of development, this cognitive scaffolding forms the basis for metaphors, systematic conceptual mappings from a source domain (the sensory-motor experience) to a superficially dissimilar target domain (the abstract concept; Lakoff 1993; Landau et al. 2010; Zhang and Li 2012): love may therefore be understood in terms of eating (“being consumed by a lover”; Barsalou 2008) and negative affective states in terms of carrying weights (“getting bogged down”; Taylor, Lord, and Bond 2009).

As metaphors represent fixed correspondences between higher-order cognitions and everyday motor and sensory processing, the experience of actions and sensations can unconsciously activate the associated cognitions (Barsalou et al. 2003; Lakoff 1993). For instance, the touch of a heavy object signals touch-related conceptual knowledge. Because weight is metaphorically connected with the concept of seriousness, rating the same job candidate’s profile while holding a heavier clipboard automatically cues the perception of a more serious candidate (Ackerman, Nocera, and Bargh 2010). Closer to our work, Li and her colleagues (Li, Wei, and Soman 2010) built on the existence of metaphors that link actions of containing objects to emotion regulation (i.e., “bottled-up anger”) and showed that psychological closure can be attained by physically enclosing an emotionally laden item. Participants who inserted in an envelope a piece of paper on which they had written about a personal desire that had not been fulfilled viewed the event less negatively than those who did not insert it in an envelope.

In summary, physical acts can activate metaphorically associated cognitions and feelings, which in turn affect judgments and experiences. Based on this past work, and on the prevalence of metaphors such as “turning the page on,” “closing the door on,” or, fittingly, “putting a lid on” to express the notion of settling a decision, we predict that performing acts of closure can make consumers experience choice closure.

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ACTS OF CLOSURE AND SATISFACTION WITH DIFFICULT CHOICES

We have theorized that physical acts of closure can trigger choice closure. In this section we identify conditions in which such activation is more likely to occur. In particular, we posit that physical acts of closure are more effective triggers in those situations in which consumers normally have difficulty experiencing choice closure, for example, when choosing from large sets. We also propose that acts of closure, by facilitating choice closure, increase satisfaction with difficult choices because these acts prevent consumers from engaging in unfavorable comparisons between the selected and the rejected alternatives.

Literature has shown that difficult choices, such as those involving similar or undesirable alternatives, trade-offs about highly valued goals, and extensive assortments, are characterized by substantial thinking about forgone options (Iyengar and Lepper 2000; Malhotra 1982; Tversky and Shafir 1992). In the case of choices made from extensive assortments, for example, the cognitive effort involved in pondering a large, versus small, number of options when searching for the best preference match induces qualms about one's ability to choose optimally and results in enhanced regret and option attachment, as well as lower decision confidence (Carmon et al. 2003; Chernev 2003; Inbar, Botti, and Hanks 2011; Iyengar, Wells, and Schwartz 2006).

These results suggest that the extent to which consumers experience choice closure may depend on the difficulty of the decision. After choosing from larger (relative to smaller) sets, consumers show a greater propensity to revisit the decision process and to engage in further comparisons between the chosen and the forgone alternatives and thus a lower likelihood of experiencing choice closure. In those cases in which consumers normally struggle with sealing off their decisions, external interventions that facilitate choice closure may be more likely to have an effect. We therefore propose that physical acts of closure facilitating choice closure are especially effective in the context of choices made from a large number of options. In this context, acts of closure signal to consumers that the decision phase preceding the choice is complete and that they have moved on to the next phase, in which they will consume their selection (Hsee et al. 1999).

These different phases involve different outcome-evaluation modes: a comparative-evaluation mode before the choice is made and an isolated-evaluation mode after the choice is made (Bettman et al. 1998). Comparative evaluations have been found to reduce the attractiveness of an option, as juxtaposing alternatives may reveal actual or perceived relative disadvantages of each individual option (Hsee and Leclerc 1998; Shafir, Simonson, and Tversky 1993). Because relative disadvantages loom larger than relative advantages (Kahneman and Tversky 1979), consumers' satisfaction with an appealing option is likely to suffer when that option is compared with others (Brenner et al. 1999).

Thus, we hypothesize that acts of closure will enable consumers to perceive a difficult decision as complete and will limit their tendency to engage in comparisons between the selected and the rejected options. As these comparisons are mostly unfavorable, choice closure triggered by acts of closure will increase the satisfaction of consumers choosing from larger sets. This leads to the following hypotheses:

H1: Performing, versus not performing, a physical act of closure is more likely to result in greater satisfaction with a choice when the choice is made from a large rather than a small choice set.

H2: The effect of the physical act of closure on satisfaction with a choice made from a large set is driven by the choice-closure process.

Because acts of closure enable a sense of completion, these acts can inhibit consumers from engaging in unfavorable comparisons without altering the actual choice context, that is, without affecting their ability to access forgone options. This differentiates the choice-closure account from other theories, which predict that preventing material or cognitive access to forgone options has a positive effect on the evaluation of the decision outcome. For instance, research on decision irreversibility showed that people who cannot change their selected course of action because the rejected options are materially unavailable to them tend to bolster the subjective value of their choices (Frey 1981; Gilbert and Ebert 2002). Similarly, recent findings demonstrated that reducing individuals' cognitive capacity, and therefore their ability to think about forgone options, reverses the negative effect on satisfaction of choosing from a large assortment (Hafner, White, and Handley 2012, study 1; see also Mogilner, Shiv, and Iyengar 2013). In contrast, we expect choice closure to operate above and beyond decision makers' actual ability to materially retrieve forgone options or to elaborate on these options. Even when participants cannot reclaim discarded options, they may still revisit their choice unless they perceive it as complete. Likewise, even when they possess enough cognitive resources to ponder over these options, they may not do so because they see the decision as resolved. In our theorizing, it is the mere perception of completion triggered by the act of closure that prevents consumers from revisiting their choices.

THE TYPES OF ACTS THAT TRIGGER CHOICE CLOSURE

So far, we have introduced the concept of choice closure, and we have proposed that physical acts of closure facilitate choice closure, particularly in the context of difficult decisions. As a result, performing an act of closure leads to greater satisfaction, and this is more likely to occur after choosing from an extensive (rather than a limited) set. In the next section, we argue that not all acts of closure are equally effective in facilitating choice closure and improving satisfaction. In particular, the extent to which physical acts facilitate choice closure and affect satisfaction depends on

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how similar the characteristics of the physical acts of closure are to the characteristics of the metaphorically associated choice-closure concept.

To explicate, as metaphors associate dissimilar domains through a fixed system of corresponding elements, a sensory-motor experience activates an abstract concept only if the structure of the experience maps onto the structure of the concept in the metaphoric relation (Lakoff 1993; Landau et al. 2010). Thus, whether physical acts of closure facilitate choice closure depends on the degree to which they conceptually map onto the choice-closure process. We have conceptualized choice closure as an intrapersonal psychological process, which takes place after making a choice, through which a consumer feels a sense of decision completion and limits comparisons between an outcome he or she had personally chosen and the alternatives that he or she had personally rejected. On this basis, we examine four ways in which such conceptual mapping may be manipulated.

First, to serve as an effective trigger of closure, the act of closure has to be performed by the decision maker rather than by someone else. Indeed, research has shown that physical acts signal the associated abstract concepts only if they are self-made (Taylor et al. 2009). For example, the act of pulling something toward oneself, versus pushing something away, triggered participants' liking only if the act was performed by the participants themselves, not when this was done by a third party (Cacioppo, Priester, and Berntson 1993). Second, for the decision maker to interpret the act of closure as a signal of completion, the act should not be imbued with an alternative meaning. Research has demonstrated that a physical experience does not cue an abstract concept if it carries a meaning that is different from the one suggested by the metaphorical association (Li et al. 2010). For example, Zhang and Li (2012; study 2) have found that participants who were made to think about light objects while carrying a heavy shopping bag rated subsequent judgments as less important than those who were made to think about neutral objects while carrying the same bag.

Third, in order to signal to oneself the completion of a decision, the physical act has to follow the choice rather than precede it. Prior literature has found that the timing of the sensory-motor experience matters in the activation of the corresponding higher-order cognition. For example, study participants who firmed their muscles during a self-control task resisted temptation more than those who did it before the task (Hung and Labroo 2011). Finally, the act can trigger choice closure if it is related to a personally chosen outcome. Literature has shown that choosing influences satisfaction only when decision makers perceive a causal connection between the act of choice and the outcome of this choice (Botti and McGill 2006). Thus, to trigger choice closure, the act of closure has to involve an outcome that has been chosen and consumed by the decision maker rather than by a third person.

We predict that when these conditions are absent, the conceptual mapping between the elements of the act of clo-

sure and those of the choice-closure process is weaker. As a result, choice closure is less likely to be facilitated, and its positive effect on satisfaction will be mitigated:

- H3:** The positive effect of the physical acts of closure on satisfaction depends on the degree of mapping between the elements of the acts and those of the choice-closure process. Specifically, this effect is weakened when the acts of closure (*a*) are performed by someone other than the decision maker, (*b*) are attributed to a reason unrelated to the choice (*c*) precede the choice, or (*d*) relate to an outcome that is chosen by someone other than the decision maker.

We tested these hypotheses in four studies, in which choice closure was facilitated by a variety of physical acts of closure. Study 1 compared choices made from small and large sets and showed that choice closure influences satisfaction more when consumers choose from a large set than from a small set. The rest of the studies focused on large assortments. Study 2 tested the choice-closure process by manipulating the degree to which consumers engage in comparisons between the chosen and the forgone options. Studies 3a and 3b tested the extent to which a closure act facilitates choice closure and influences satisfaction by manipulating the mapping of the act onto the concept.

STUDY 1

In the first study, we facilitated choice closure by asking participants to place a transparent lid over a chocolate assortment after they selected one option from either a smaller or a larger version of this assortment. This study tested hypothesis 1, which predicts that physical acts of closure facilitate choice closure more effectively in the context of large assortments, but that this effect is less pronounced in the context of small assortments. To test hypothesis 2, which predicts that choice closure explains differences in satisfaction, we measured the extent to which acts of closure activate a sense of decision completion and the associated inhibition of comparison engagement.

Method

Study 1 used a 2 (choice size: small vs. large) \times 2 (choice-closure trigger: closed vs. not-closed) between-subjects design. One hundred fifty-nine students from different universities in London participated in this 25-minute study in exchange for £10.

After entering the lab, participants were seated in front of a table displaying a cake dome composed of a tray and a transparent lid. Inside the cake dome, participants could see a set of either 24 (large) or six (small) chocolates. In the large-set condition, there were four rows of six chocolates each, whereas in the small-set condition there was only one row of six chocolates. The individual rows of chocolates used in the large-set condition were rotated across participants in the small-set condition (Iyengar and Lepper

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2000). In both conditions, each chocolate was described by a label placed next to it (e.g., marzipan orange dark chocolate).

The experimenter told participants that the study was part of a marketing research project examining chocolate consumption, which involved choosing and tasting a chocolate. Participants in both closed and not-closed conditions were instructed to lift the transparent lid off the tray and to place it on the table. The experimenter then asked participants to choose a chocolate to taste and to put it on a small plate that was positioned next to the cake dome. Participants were also reminded to take their time before choosing a chocolate because they would not be allowed to change their selection. After participants had placed the chosen chocolate on the plate, the choice-closure-trigger manipulation was conducted: in the not-closed conditions, the experimenter simply told participants to taste the chocolate; in the closed conditions, the experimenter told them to put the transparent lid back on the tray before tasting the chocolate.

After tasting the selected chocolate, participants answered one question about their satisfaction: "How satisfied are you with the chocolate that you chose?" In order to test our prediction that the physical act of covering the forgone chocolates with the lid would facilitate choice closure, participants also answered questions tapping into the two inter-related elements of the choice-closure process: a sense of decision completion and the associated reduced tendency to engage in comparisons between the chosen and the forgone options. To measure decision completion, we created four items ("To what extent do you feel you have reached closure about your choice of what chocolate to taste?"; "To what extent are you still thinking about your decision of what chocolate to taste? (reverse coded)"; "After choosing your chocolate, to what extent did you perceive that decision as settled?"; "People sometimes use expressions such as 'I have turned my back on' or 'I have closed the door on' something. To what extent do you think such expressions describe how you feel about your decision of what chocolate to taste?") and borrowed three items from research on psychological closure (Beike and Wirth-Beaumont 2005), which we adapted to our decision-making context ("After choosing your chocolate, to what extent did you perceive that decision as 'unfinished business'?" (reverse coded); "After choosing your chocolate, to what extent did you perceive that decision as a 'closed book'?"; "After choosing your chocolate, to what extent did you think of that decision as behind you?"). To measure the extent to which participants engaged in comparisons we asked two questions: "While you were eating the chocolate, to what extent did you keep thinking about the other chocolates on the table?" and "While you were eating the chocolate, to what extent did you try to compare it with other chocolates on the table?" All questions were answered on 7-point scales (1 = not at all/7 = completely). An exploratory factor analysis using a varimax rotation confirmed that two orthogonal factors explained 61.54% of the variance. The first factor (34.14% of variance explained) consisted of the two comparison-engagement items, and the

second factor (27.40% of variance explained) consisted of the remaining seven items measuring decision completion. Extracting a third factor added little variance to the solution and reduced the interpretability of the factor loadings.

Results

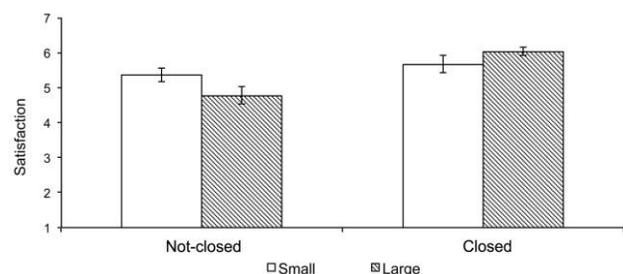
Seventeen participants (12 in the not-closed condition and five in the closed condition) who did not follow the instructions to either leave the lid open or to close it were eliminated from the following analyses, which left us with 142 participants. Including these participants did not significantly change the following results.

Choice Satisfaction. To test participants' satisfaction with their choice, we conducted a 2 (choice-set size: small vs. large) \times 2 (choice-closure trigger: closed vs. not-closed) ANOVA on the one-item satisfaction measure (results are shown in fig. 1). This analysis yielded a main effect of choice-closure trigger: participants in the closed condition ($M = 5.87$, $SD = 1.04$) were more satisfied than those in the not-closed condition ($M = 5.04$, $SD = 1.38$; $F(1, 138) = 14.41$, $p < .001$). There was no main effect of choice-set size on satisfaction, as participants in the large-set condition ($M = 5.39$, $SD = 1.36$) were as satisfied as those in the small-set condition ($M = 5.51$, $SD = 1.20$; $F(1, 138) < 1$, NS). The interaction between choice-set size and choice-closure trigger was significant ($F(1, 138) = 5.36$, $p < .05$). Contrast analyses further showed that, as predicted in hypothesis 1, when faced with a large set, participants who put the lid back on the tray were more satisfied than those who did not ($M_{\text{closed}} = 6.03$, $SD = 0.74$; $M_{\text{not-closed}} = 4.78$, $SD = 1.54$; $F(1, 138) = 21.07$, $p < .0001$). However, when faced with a small set, participants across the closed and not-closed conditions were equally satisfied ($M_{\text{closed}} = 5.67$, $SD = 1.32$; $M_{\text{not-closed}} = 5.36$, $SD = 1.08$; $F(1, 138) < 1$, NS).

Consistent with our theorizing that in the context of choices made from small sets, consumers naturally experience choice closure even in the absence of an external

FIGURE 1

STUDY 1: INTERACTIVE EFFECT OF CHOICE-CLOSURE TRIGGER AND CHOICE-SET SIZE ON SATISFACTION

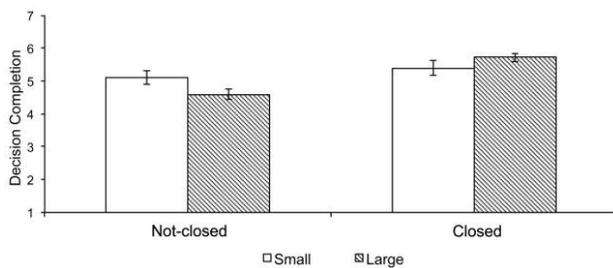


NOTE.—The error bars represent standard errors.

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FIGURE 2

STUDY 1: INTERACTIVE EFFECT OF CHOICE-CLOSURE TRIGGER AND CHOICE-SET SIZE ON DECISION COMPLETION



NOTE.—The error bars represent standard errors.

intervention, when the act of closure was not performed participants in the small-set condition were more satisfied than those in the large-set condition ($F(1, 138) = 4.27, p < .05$). However, when the act of closure was performed, the difference in satisfaction between the two choice-set size conditions was not significant ($F(1, 138) = 1.49, NS$).

Choice-Closure Process. The seven items measuring the decision-completion element of the choice-closure process were averaged into a single score ($\alpha = 0.82$), which was submitted to a 2 (choice-set size: small vs. large) \times 2 (choice-closure trigger: closed vs. not-closed) ANOVA. The ANOVA revealed a significant main effect of choice-closure trigger: participants who put the lid back on the tray ($M = 5.58, SD = 1.07$) perceived their decision to be more complete than those who did not ($M = 4.83, SD = 1.16; F(1, 138) = 14.19, p < .001$). There was no main effect of choice-set size on completion ($M_{\text{large}} = 5.16, SD = 1.11; M_{\text{small}} = 5.24, SD = 1.25; F(1, 138) < 1, NS$). The ANOVA also yielded a significant interaction between size and trigger ($F(1, 138) = 4.96, p < .05$; see fig. 2). Supporting our hypotheses, participants in the closed condition ($M = 5.72, SD = 0.82$) experienced a greater sense of decision completion than those in the not-closed condition when facing a large set ($M = 4.60, SD = 1.08; F(1, 138) = 20.28, p < .0001$) but not when facing a small set ($M_{\text{closed}} = 5.40, SD = 1.32; M_{\text{not-closed}} = 5.11, SD = 1.19; F(1, 138) = 1.06, NS$). In line with our theory, in the not-closed condition, participants choosing from a small set experienced a greater sense of completion than those choosing from a large set ($F(1, 138) = 3.78, p = .05$). In the closed condition, however, this difference was not significant ($F(1, 138) = 1.48, NS$).

The two items measuring the comparison-engagement element of the choice-closure process were also averaged into a single score ($r = 0.77$), with lower engagement in comparisons indicating greater choice closure. A 2 (choice-set size: small vs. large) \times 2 (choice-closure trigger: closed vs. not-closed) ANOVA conducted on this score revealed a main effect of choice-set size: consistent with our theorizing,

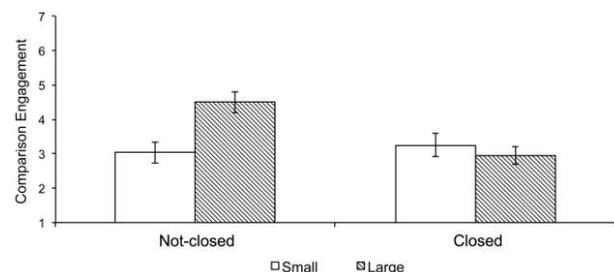
participants who chose from a large set ($M = 3.73, SD = 1.90$) had a greater tendency to compare than those who chose from a small set ($M = 3.13, SD = 1.75; F(1, 138) = 3.81, p = .05$). The main effect of choice-closure trigger was also significant, as participants who closed the lid ($M = 3.08, SD = 1.69$) engaged in comparisons less than those who did not ($M = 3.83, SD = 1.94; F(1, 138) = 4.96, p < .05$). In addition, there was a significant interaction between size and trigger ($F(1, 138) = 8.82, p < .005$), which is illustrated in figure 3. Contrast analyses supported our predictions by showing that participants in the closed condition ($M = 2.95, SD = 1.60$) compared less than those in the not-closed condition ($M = 4.49, SD = 1.87; F(1, 138) = 15.24, p = .0001$) when confronted with a large set but not when confronted with a small set ($M_{\text{closed}} = 3.25, SD = 1.81; M_{\text{not-closed}} = 3.03, SD = 1.72; F(1, 138) < 1, NS$). Again consistent with our premise, in the not-closed condition participants faced with a small set reported a lower tendency to compare than those faced with a large set ($F(1, 138) = 12.51, p < .001$). This difference was, however, not significant in the closed condition ($F(1, 138) < 1, NS$).

Mediation. Hypothesis 2 predicts that the choice-closure process explains the effect of acts of closure on choice satisfaction. Note that our theorizing entails a correlation between the two elements of the choice-closure-process: decision completion and comparison engagement. However, based on past literature (Brenner et al. 1999), the comparison-engagement element is more directly linked to satisfaction, with fewer comparisons resulting in more positive evaluation of the selected outcome. Therefore, we first examined the association between the two choice-closure-process elements by regressing comparison engagement on decision completion. This regression showed that decision completion predicts comparison engagement ($B = -0.70, SE = 0.12; t(140) = -5.83, p < .0001$).

We then performed a mediation using a mediated moderation model (model 2, Preacher, Rucker, and Hayes 2007;

FIGURE 3

STUDY 1: INTERACTIVE EFFECT OF CHOICE-CLOSURE TRIGGER AND CHOICE-SET SIZE ON COMPARISON ENGAGEMENT



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see also Muller, Judd, and Yzerbyt 2005) in which choice-set size moderated the effect of choice-closure trigger (the independent variable) on comparison engagement (the mediator), and comparison engagement exerted a direct influence on satisfaction (the dependent variable). We used dummy variables to account for the two levels of the independent and moderator variables. We coded choice-closure trigger as 1, 0 to indicate the closed and not-closed conditions, respectively, and choice-set size as 1, 0 to indicate the small and large conditions, respectively. In order to test whether the indirect effects of comparison engagement was significant, we conducted a bias-corrected (BC) bootstrapping analysis (Hayes 2013). The indirect effect (based on 5,000 bootstraps) conducted at both levels of choice-set size (large vs. small) revealed that comparison engagement mediated the relationship between choice-closure trigger and satisfaction in the large-set condition (95% BC bootstrap confidence interval [CI] of 0.0137 to 0.4792, with an estimate of 0.1852) but not in the small-set condition (95% BC bootstrap CI of -0.2133 to 0.0615 , with an estimate of -0.0264).

Discussion

In study 1, we facilitated choice closure by asking participants to place a transparent lid over the forgone options after making their choice. Consistent with hypothesis 1, results showed that this choice-closure trigger increased satisfaction when the choice was made from a large number of options but not when it was made from a small number of options. Note that performing the physical act of closure had an effect on satisfaction even though participants in the closed condition were as able as those in the not-closed condition to elaborate on the rejected chocolates, and even though both sets of participants were explicitly told that their decision was not reversible. This suggests that choice closure operated above and beyond participants' cognitive ability to access the forgone options (Hafner et al. 2012) and these options' material accessibility (Gilbert and Ebert 2002).

Given that prior research showed that a choice is less difficult when made from a limited assortment than from an extensive one (Malhotra 1982), we predicted consumers choosing from small sets to be less likely to revisit their decision after they had made a choice. In line with this reasoning, and supporting hypothesis 2, the act of covering the forgone options was more effective in inducing choice closure in the large- than in the small-set condition. Large-set participants who closed the lid experienced higher decision completion and lower comparison engagement than small-set participants, and the effect of the act of closure on satisfaction was mediated by comparison engagement in the large-set condition.

As expected, in study 1 there was no effect of choice-closure trigger on satisfaction in the small-set condition. For this reason, the next studies focused only on choices made from large sets. Study 2 addresses two limitations of study 1. First, in study 1 the evidence supporting the choice-closure process is only correlational. In study 2 we manipulated

the comparison-engagement element of this process orthogonally to the choice-closure trigger. According to our theorizing, acts of closure facilitate the perception of a decision as settled and cause the adoption of a more isolated, rather than comparative, evaluation mode. We therefore explicitly instructed participants to evaluate the decision outcome either in isolation or in comparison with the forgone options after closing (or not) a menu listing the choice alternatives; we then compared these two conditions with a conceptual replication of the large-set condition from study 1, in which no explicit evaluation instructions were given.

Second, study 1 results could be explained by a potential alternative account based on affect. Literature has shown that consumers comparing a large number of options suffer from negative affect (Carmon et al. 2003; Iyengar and Lepper 2000). Thus, the act of closing the lid on the rejected chocolates may have not only triggered choice closure but also encapsulated this negative affect. Just as the act of inserting an emotionally painful narrative into an envelope cues psychological closure (Li et al. 2010), the act of covering the assortment of forgone chocolates could have insulated participants from the negative emotions felt during the decision process and improved their eventual satisfaction. We collected measures of affect in study 2 to examine this alternative explanation.

STUDY 2

Method

This study used a 2 (choice-closure trigger: closed vs. not-closed) \times 3 (evaluation mode: replication vs. isolated vs. comparative) between-subjects design. One hundred fifty-four students from different universities in London participated in this 30-minute study in exchange for £10.

To keep the replication condition as similar as possible to that in the previous study, we gave participants in this condition the same cover story as in study 1, namely, that the study was part of a marketing research project examining tea consumption and that it involved choosing and consuming one type of tea. As we explain below, the isolated- and comparative-evaluation conditions involved additional tasks that enabled these evaluation modes. As part of our effort to make the cover story more credible, participants in these conditions read that the study was part of a marketing research project aimed at collecting feedback about a series of workshops on concentration, and that the concentration tasks involved choosing and consuming tea.

Participants were guided to a table on which there was a menu listing a selection of 24 teas, each described with a picture, a name (e.g., Genmaicha green tea), and a brief text (e.g., vibrant green sencha blended with rice kernels). The menu was closed, so that participants could only see its cover, which was labeled "Tea Menu." Participants across all conditions were asked to open the menu and to carefully examine the descriptions before choosing a tea to taste because, as in study 1, they would not be able to change their selection. In the not-closed condition, participants simply

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chose one tea, whereas in the closed condition participants were asked to close the menu after making their choice. In both conditions, the menu was then moved out of participants' sight.

After the choice-closure-trigger manipulation was administered to all participants, those in the replication condition tasted a freshly brewed tea, which unknown to them was the same for everyone. Participants in the isolated- and comparative-evaluation conditions were instead asked, while tasting the tea, to perform a 5-minute task involving the tea they had selected. In the isolated-evaluation condition, participants were made to evaluate the decision outcome in isolation. They were told that concentration could be improved by both meditation and consumption of specific food and drinks, such as tea, and that they would therefore practice a meditation technique purportedly based on focusing one's attention on a fixed object, the tea they had previously chosen. After listening to instructions recorded by a professional voice coach pretending to be a meditation expert, participants were asked to take three sips of their freshly brewed tea. While taking each sip, they were asked to concentrate their attention on specific aspects of the tea, such as its color, smell, and taste.

In the comparative-evaluation condition, participants were made to evaluate the decision outcome in comparison with the forgone options. They were told that concentration could be improved by both strengthening the memory and consuming food and drinks with specific ingredients, such as tea. They would therefore sip the freshly brewed tea that they chose while practicing an alleged memory technique based on recalling autobiographical events. Following instructions recorded by the same voice coach described above, participants took three sips and after each sip recalled details about the decision process they had just experienced, such as the names of the teas they did not choose, their characteristics, and how they compared with the chosen tea. Participants then answered one question about their satisfaction: "How satisfied are you with the tea that you chose?" (1 = not at all/7 = completely).

As our theory posits that acts of closure induce a more isolated, rather than comparative, evaluation mode, we predicted that the physical act would have little or no effect when participants were already made to be in a specific evaluation mode. In particular, we expected that, whether or not they engaged in the act of closure, participants who were instructed to adopt an isolated-evaluation mode would be as satisfied as those who performed that act without receiving any further instructions. Likewise, whether or not they engaged in the act of closure, participants who were instructed to adopt a comparative-evaluation mode would be as satisfied as those who did not perform the act without further instructions.

Finally, to rule out the alternative affect-based explanation, we had participants fill out five items capturing their current affect on 7-point bipolar scales (1 = cheerful/7 = depressed; 1 = relaxed/7 = stressed; 1 = pleased/7 =

annoyed; 1 = happy/7 = unhappy; 1 = in a good mood/7 = in a bad mood), which were adapted from Pham (1998).

Results

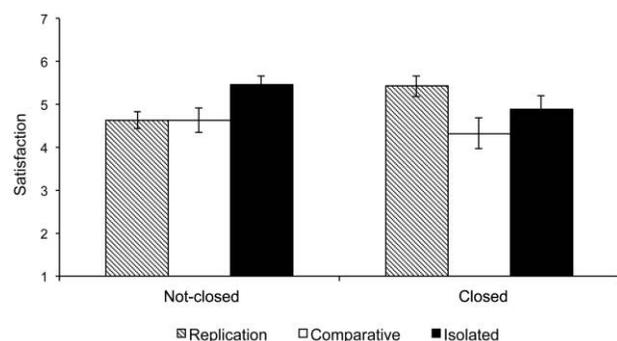
Six participants (three in the comparative condition and three in the replication condition) who were instructed to leave the menu open but nonetheless closed it were eliminated from the following analyses, leaving us with 148 participants. Including these participants in the following analyses did not significantly change the results.

Choice Satisfaction. A 2 (choice-closure trigger: closed vs. not-closed) \times 3 (evaluation mode: replication vs. isolated vs. comparative) ANOVA conducted on the one-item satisfaction measure revealed that the main effect of choice-closure trigger was not significant ($M_{\text{closed}} = 4.91$, $SD = 1.59$; $M_{\text{not-closed}} = 4.86$, $SD = 1.19$; $F(1, 142) < 1$, NS) but that of evaluation mode was significant ($M_{\text{replication}} = 5.04$, $SD = 1.24$; $M_{\text{isolated}} = 5.14$, $SD = 1.32$; $M_{\text{comparative}} = 4.48$, $SD = 1.60$; $F(2, 142) = 3.35$, $p < .05$): participants in the comparative-evaluation conditions were less satisfied than those in both the isolated-evaluation ($F(1, 142) = 5.70$, $p < .05$) and the replication ($F(1, 142) = 4.28$, $p < .05$) conditions, and the difference in the last two groups was not significant ($F(1, 142) < 1$, NS). The interaction between trigger and evaluation mode was significant ($F(2, 142) = 3.53$, $p < .05$). Contrast analyses showed that, in line with the findings of study 1, in the replication condition participants who closed the menu before consuming the tea ($M = 5.43$, $SD = 1.29$) were more satisfied than those who left the menu open before consuming the tea ($M = 4.64$, $SD = 1.06$; $F(1, 142) = 4.62$, $p < .05$; see fig. 4).

More important for this study, and consistent with our predictions, contrast analyses revealed that participants in the isolated-evaluation conditions experienced the same level of satisfaction regardless of whether they closed the

FIGURE 4

STUDY 2: INTERACTIVE EFFECT OF CHOICE-CLOSURE TRIGGER AND EVALUATION MODE ON SATISFACTION



NOTE.—The error bars represent standard errors.

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menu ($M = 4.88$, $SD = 1.54$) or left it open ($M = 5.45$, $SD = 0.94$; $F(1, 142) = 1.93$, NS), and that their average satisfaction ($M = 5.14$, $SD = 1.32$) was also not significantly different from that of participants in the replication condition who closed the menu ($F(1, 142) < 1$, NS). Similarly, the satisfaction of participants in the closed and not-closed comparative-evaluation conditions was the same ($M_{\text{closed}} = 4.33$, $SD = 1.81$; $M_{\text{not-closed}} = 4.63$, $SD = 1.38$; $F(1, 142) < 1$, NS), and the average satisfaction of these two groups ($M = 4.48$, $SD = 1.60$) was not significantly different from that of participants in the replication condition who left the menu open ($F(1, 142) < 1$, NS).

Contrast analyses also revealed that, consistent with our theory, the isolated-evaluation mode generated greater satisfaction than the comparative-evaluation mode, regardless of whether these evaluation modes were facilitated by instructions or by physical acts. Specifically, in the closed conditions, participants who were made to evaluate in isolation by practicing meditation while drinking the tea were as satisfied as those who simply drank the tea ($F(1, 142) = 2.12$, NS). The average satisfaction of these two groups ($M = 5.17$, $SD = 1.42$) was greater than that of participants who were made to evaluate through comparisons by performing the memory exercise ($F(1, 142) = 5.87$, $p < .05$). In the not-closed conditions, participants who completed the memory exercise while drinking the tea were as satisfied as those who only drank the tea ($F(1, 142) < 1$, NS), and both groups ($M = 4.63$, $SD = 1.21$) were less satisfied than those who practiced meditation ($F(1, 142) = 5.13$, $p < .05$). Table 1 reports all means and standard deviations.

Affect. A 2 (choice-closure trigger: closed vs. not-closed) \times 3 (evaluation mode: replication vs. isolated vs. comparative) ANOVA was conducted on the five-item affect measures ($\alpha = 0.89$), with lower scores indicating more positive affect. There was a significant effect of evaluation mode ($F(2, 142) = 6.91$, $p < .005$): positive affect of participants in the replication condition ($M = 2.34$, $SD = 0.98$) was marginally higher than that of participants in the comparative ($M = 3.05$, $SD = 0.98$; $F(1, 142) = 13.82$, $p < .0005$) and isolated ($M = 2.66$, $SD = 0.95$; $F(1, 142) = 2.95$, $p = .09$) evaluation-mode conditions. Positive affect of participants in the isolated-evaluation-mode condition was marginally higher than that of participants in the comparative-evaluation-mode condition ($F(2, 142) = 3.38$, $p = .07$). No other effects were significant (all $p > .56$). The lack of a significant interaction between acts of closure and evaluation modes suggests that affect cannot explain the observed pattern of results. Indeed, the interactive effect on satisfaction held even after controlling for participants' affective responses ($F(2, 141) = 4.33$, $p < .05$).

Discussion

The replication conditions of study 2 mirrored the findings of the large-choice-set conditions of study 1. That is, participants for whom choice closure was facilitated by closing the menu were more satisfied with the option selected from

TABLE 1
STUDY 2: MEAN (SD) OF SATISFACTION WITH
THE TEA

	Replication	Isolated	Comparative
Not-closed	4.64 (1.06)	5.45 (.94)	4.63 (1.38)
Closed	5.43 (1.29)	4.88 (1.54)	4.33 (1.81)

a large set than those for whom choice closure was not facilitated because the menu was left open. More important, study 2 added support to hypothesis 2 by manipulating the comparison-engagement element of the choice-closure process. Our results indicated that simulating (or not) the psychological process associated with comparison engagement had the same effect on satisfaction as performing (or not) a physical act of closure. Our results also ruled out the possibility that acts of closure improved satisfaction because they allowed decision makers to seal off the negative affect felt during the decision process.

The next two studies tested hypothesis 3. This hypothesis predicts that the likelihood that physical acts of closure will result in choice closure depends on the degree to which the elements of these two domains—sensory-motor and conceptual—map onto each other. Studies 3a and 3b manipulated the degree of mapping between physical and conceptual closure to show that a weaker mapping reduces the potential of the act to signal choice closure, and that its subsequent effect on satisfaction is mitigated. In study 3a we manipulated the agent of the closure act and the reason for performing that act. In study 3b we manipulated the timing of the closure act and whether the consumed outcome was personally chosen or randomly assigned.

STUDY 3A

Method

This study employed a 2 (choice-closure trigger: closed vs. not-closed) \times 3 (attribution: replication vs. external agent vs. external reason) between-subjects design. One hundred sixty students from different universities in London, participated in this 25-minute study in exchange for £10.

Participants sat at a table on which there were a menu listing a selection of 24 biscuits—each described by a picture, a name (e.g., Sultan), and a brief text (e.g., Belgian milk chocolate coated biscuit decorated with dark chocolate)—and 24 nontransparent plastic bowls, each containing one of the biscuits. The menu, which was labeled “Biscuit Menu,” was closed, and the bowls were covered with lids to prevent participants from seeing the biscuits placed inside.

As before, participants were told that the study was part of a marketing research project examining biscuit consumption and that it involved a tasting task. In the replication condition, the experimenter asked participants to open the menu and to carefully examine the descriptions before

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choosing a biscuit to taste. Next, the choice-closure-trigger manipulation was conducted: in the not-closed condition participants simply chose one biscuit, whereas in the closed condition they were asked to close the menu after making their choice.

The external-agent and external-reason conditions manipulated the extent to which the act of closure mapped onto the choice-closure process. The external-agent condition manipulated the mapping by having the experimenter perform the closure act on behalf of the participants. Given that physical acts are more likely to trigger the associated abstract concepts when they are self-made (Taylor et al. 2009), we predicted that the physical-to-mental mapping would be weaker when the physical acts were made by the experimenter rather than by the decision maker. The procedure in the external-agent condition was the same as in the replication condition, except that in the not-closed condition the experimenter opened the menu from which participants made their choice, and in the closed condition, after participants decided which biscuit to taste, the experimenter closed the menu. In both the replication and the external-agent conditions, the experimenter used a chart placed next to the bowls indicating which biscuit was in each bowl to verify the location of the selected biscuit.

In the external-reason condition we manipulated the physical-to-mental mapping by providing a reason to perform an act of closure that was unrelated to the decision process. We did this because a physical experience is less likely to cue an abstract concept if it is imbued with a meaning that is different from the one suggested by the metaphorical association (Li et al. 2010). The procedure in the external-reason condition was similar to that in the replication condition, except that in the not-closed condition, after participants made their choice, the experimenter asked them to leave the menu open because she needed to check a chart that was printed inside the menu in order to locate the chosen biscuit; in the closed condition, the experimenter asked participants to close the menu because the chart was printed on its back. As before, across all conditions participants were informed that they could not change their biscuit selection, and the menus were moved out of their sight.

After eating the biscuit, participants answered the same question about satisfaction that was asked in study 2. We predicted that in those conditions in which the physical-to-mental mapping was reduced, the potential of the act of closure to signal choice closure would also be weakened. As a result, the positive effect of acts of closure on satisfaction would be mitigated in the external-agent and external-reason conditions.

Results

Six participants (all in the replication condition) did not follow the instructions to leave the menu open after choosing and were therefore removed from the following analyses, leaving us with 154 participants. Including these participants did not significantly change the results reported below. A 2 (choice-closure trigger: closed vs. not-closed) \times 3 (attri-

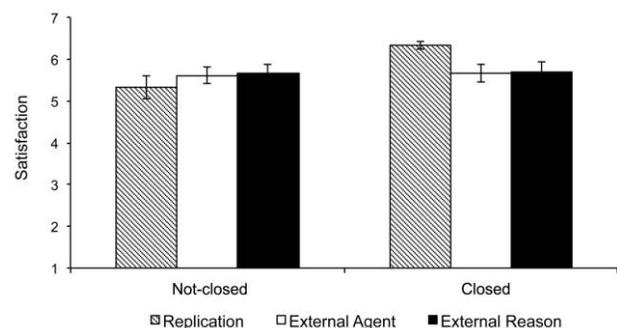
bution: replication vs. external agent vs. external reason) ANOVA was conducted on the one-item satisfaction measure. The main effect of attribution was not significant ($M_{\text{replication}} = 5.80$, $SD = 1.23$; $M_{\text{agent}} = 5.64$, $SD = 0.96$; $M_{\text{reason}} = 5.69$, $SD = 1.20$; $F(2, 148) < 1$, NS), but the main effect of trigger was that participants who closed the biscuit menu ($M = 5.90$, $SD = 0.99$) were more satisfied with their choice than those who left the menu open ($M = 5.54$, $SD = 1.26$; $F(1, 148) = 3.94$, $p < .05$). There was also a significant interaction between attribution and trigger ($F(2, 148) = 3.03$, $p = .05$; see fig. 5).

Contrast analyses showed that in the replication condition, participants who closed the menu ($M = 6.33$, $SD = 0.48$) were more satisfied with their choice than those who kept the menu open ($M = 5.33$, $SD = 1.49$; $F(1, 148) = 10.00$, $p < .005$), replicating the results in the large-choice-set condition obtained in prior studies. However, as predicted, this difference in satisfaction was not significant in both the external-agent ($M_{\text{closed}} = 5.67$, $SD = 0.97$; $M_{\text{not-closed}} = 5.62$, $SD = 0.97$; $F(1, 148) < 1$, NS) and the external-reason ($M_{\text{closed}} = 5.71$, $SD = 1.21$; $M_{\text{not-closed}} = 5.67$, $SD = 1.22$; $F(1, 148) < 1$, NS) conditions.

Consistent with our theory, contrast analyses also showed that among participants who closed the menu, those in the replication condition were more satisfied than those in the external-agent ($F(1, 148) = 3.92$, $p < .05$) and external-reason ($F(1, 148) = 3.90$, $p = .05$) conditions, but the difference in satisfaction between the last two groups was not significant ($F(1, 148) < 1$, NS). However, among participants who kept the menu open, the differences in replication, external-agent, and external-reason conditions were all not significant (all $F < 1.31$, all $p > .25$). Means and standard deviations are illustrated in table 2.

FIGURE 5

STUDY 3A: INTERACTIVE EFFECT OF CHOICE-CLOSURE TRIGGER AND ATTRIBUTION ON SATISFACTION



NOTE.—The error bars represent standard errors.

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TABLE 2
STUDY 3A: MEAN (SD) OF SATISFACTION WITH
THE BISCUIT

	Replication	External agent	External reason
Not-closed	5.33 (1.49)	5.62 (.97)	5.67 (1.22)
Closed	6.33 (.48)	5.67 (.97)	5.71 (1.21)

STUDY 3B

Method

Study 3b used a 3 (choice-closure trigger: post-choice-closed vs. not-closed vs. pre-choice-closed) \times 2 (choice: self vs. random) between-subjects design. One hundred sixty-two university students from different universities in London received £10 to participate in this 30-minute study.

As in study 1, the biscuits were displayed inside a cake dome composed of a tray and a transparent lid and were identified by a name (e.g., Cocoline) and a brief description (e.g., double biscuit filled with coconut cream). Participants were seated at a table in front of the cake dome and were told that the study was part of a marketing research project examining people's consumption of biscuits. No mention was made that the study required them to make a choice. To give participants in all conditions the opportunity to examine the choice alternatives, we asked them to open the lid and inspect the biscuits and their descriptions to form a clear impression of the selection. After 30 seconds, the choice-closure-trigger manipulation was administered.

Recall that in our earlier studies, participants in the closed condition made a choice, performed the act of closure and then consumed the chosen alternative. We theorized that the act of closure following the choice would signal to the decision makers that their decision was complete. In this study we manipulated the extent to which the physical and mental processes of closure mapped onto each other by varying the timing of the act of closure to take place either after the choice or before it, as the timing of the acts has been shown to matter in cueing the associated higher-level cognitions (Hung and Labroo 2011). Specifically, the post-choice-closed and not-closed conditions were the same as the closed and not-closed conditions in study 1: participants first chose one biscuit to taste from the selection and then put the lid back on the tray or did not, respectively, before eating the biscuit. In the pre-choice-closed condition the act of closure was performed before making the choice: participants first put the transparent lid back on the tray and only then chose one biscuit to taste. As before, all participants were told that they would not be able to change their selection. We expected to replicate the effect of the act of closure on satisfaction in the post-choice-closed condition and to mitigate this effect in the pre-choice-closed condition.

After the biscuit selection, the choice manipulation was conducted. Participants consumed either the option they per-

sonally chose or another option that was chosen for them at random. Specifically, in the self-choice condition, participants were informed that, in addition to tasting the biscuit they selected, they would be given a randomly chosen biscuit from the same selection to take home. In the random-choice condition, participants were told that they would get the biscuit they selected to take home, but before that they would taste another biscuit, one randomly chosen from the same selection. The experimenter then proceeded to randomly select a biscuit by pulling one of 24 slips of paper indicating the biscuit names from a glass bowl. Participants in all conditions thus each received two biscuits. Those in the self-choice condition tasted and evaluated the biscuit they chose (and took home a randomly chosen additional biscuit). In contrast, those in the random-choice condition tasted and evaluated a randomly chosen biscuit (and took home the one they chose). Because the random assignment of the biscuit reduced participants' perception of having experienced a decision process (Botti and McGill 2006), we expected a weaker mapping and lower satisfaction in this condition.

After eating either the self-chosen or the randomly assigned biscuit, participants answered the same question about satisfaction that was asked in the previous studies. We also gathered additional process evidence by analyzing participants' considerations during consumption. To do so, we asked participants an open-ended question: "Can you please list the thoughts you had while you were tasting the biscuit?" We coded this question based on the number of times participants spontaneously mentioned comparisons between the biscuit they had eaten and those that had been forgone. We predicted that fewer comparisons would be mentioned in the post-choice-closed/self-choice condition than in all the other conditions, and that this number of comparisons would mediate the effect of the act of closure on satisfaction in the self-choice conditions.

Results

Sixteen participants (11 in the pre-choice-closed condition and five in the not-closed condition) who did not follow the experimental instructions were eliminated from the following analyses. The final participants' count was therefore 146. Including these participants did not significantly change the results reported below.

Choice Satisfaction. To test the extent to which participants were satisfied with their choice, the satisfaction item was submitted to a 3 (choice-closure trigger: post-choice-closed vs. not-closed vs. pre-choice-closed) \times 2 (choice: self vs. random) ANOVA, which revealed a main effect of choice, such that participants in the self-choice condition ($M = 5.56$, $SD = 1.28$) were more satisfied than those in the random-choice condition ($M = 4.83$, $SD = 1.43$; $F(1, 140) = 9.58$, $p < .005$). The main effect of choice-closure trigger was marginally significant ($F(2, 140) = 2.77$, $p = .07$): participants in the post-choice-closed condition ($M = 5.50$, $SD = 1.32$) were as satisfied as those in the pre-

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choice-closed condition ($M = 5.13$, $SD = 1.15$; $F(1, 140) = 1.90$, NS) and more satisfied than those in the not-closed condition ($M = 4.88$, $SD = 1.65$; $F(1, 140) = 5.44$, $p < .05$). These last two groups experienced the same level of satisfaction ($F(1, 140) < 1$, NS). More important, the interaction between choice-closure trigger and choice was significant ($F(2, 140) = 3.16$, $p < .05$; see fig. 6).

Contrast analyses further showed that among the self-choice participants, those in the post-choice-closed condition who performed the act of closing the lid after making the choice ($M = 6.19$, $SD = 0.69$) were more satisfied than those in the not-closed condition who did not close the lid ($M = 4.90$, $SD = 1.73$; $F(1, 140) = 10.95$, $p < .005$). These results replicated previous findings. However, consistent with our predictions, the act of closing did not boost satisfaction of participants in the pre-choice-closed condition, as these participants ($M = 5.43$, $SD = 0.99$) were less satisfied than those in the post-choice-closed condition ($F(1, 140) = 3.98$, $p < .05$) and as satisfied as those in the not-closed conditions ($F(1, 140) = 1.75$, NS).

Also in line with our predictions, among participants in the random-choice conditions who ate a biscuit selected for them at random by the experimenter, the differences in satisfaction among post-choice-closed, not-closed, and pre-choice-closed conditions were all not significant ($M_{\text{post-choice-closed}} = 4.81$, $SD = 1.44$; $M_{\text{not-closed}} = 4.85$, $SD = 1.61$; $M_{\text{pre-choice-closed}} = 4.83$, $SD = 1.23$; all $F < 1$, NS). Means and standard deviations are illustrated in table 3.

Engagement in Comparisons. To test the comparison-engagement element of the choice-closure process, two raters who were blind to the hypotheses coded participants' responses to the open-ended question about their thoughts while eating the biscuits by counting the number of times these thoughts involved a comparison between the biscuit they ate and the other biscuits in the selection they did not eat. For example, the thought "thinking will it be better than

TABLE 3
STUDY 3B: MEAN (SD) OF SATISFACTION WITH THE BISCUIT

	Self	Random
Post-choice-closed	6.19 (.69)	4.81 (1.44)
Not-closed	4.90 (1.73)	4.85 (1.61)
Pre-choice-closed	5.43 (.99)	4.83 (1.23)

the biscuit I have selected" was counted as one comparison. As a high inter-rater reliability was observed ($K = 0.89$, $p < .001$), we averaged the two raters' codings to form one score of number of comparisons per participant. A lower number of comparisons indicated a higher degree of choice closure.

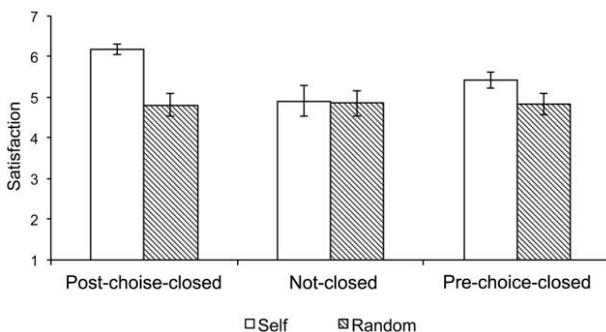
We conducted a 3 (choice-closure trigger: post-choice-closed vs. not-closed vs. pre-choice-closed) \times 2 (choice: self vs. random) ANOVA on number of mentioned comparisons. Two participants did not complete this open-ended question, which left us with 144 participants in total. The ANOVA revealed that the main effects of choice-closure trigger ($M_{\text{post-choice-closed}} = 0.42$, $SD = 0.60$; $M_{\text{not-closed}} = 0.60$, $SD = 0.71$; $M_{\text{pre-choice-closed}} = 0.59$, $SD = 0.75$) and choice ($M_{\text{self}} = 0.46$, $SD = 0.64$; $M_{\text{random}} = 0.59$, $SD = 0.72$) on satisfaction were both not significant (all $F < 1.12$, all $p > .33$), but the interaction between choice-closure trigger and choice was significant ($F(2, 138) = 3.23$, $p < .05$). Contrast analyses showed that among participants who ate the biscuits they had chosen, those in the post-choice-closed condition ($M = 0.17$, $SD = 0.37$) engaged in fewer comparisons than those in the not-closed ($M = 0.68$, $SD = 0.78$; $F(1, 138) = 6.27$, $p < .05$) and pre-choice-closed ($M = 0.61$, $SD = 0.66$; $F(1, 138) = 5.10$, $p < .05$) conditions. There was no difference in number of comparisons between the not-closed and the pre-choice-closed groups ($F(1, 138) < 1$, NS). For participants who ate randomly assigned biscuits, however, the differences across post-choice-closed, not-closed, and pre-choice-closed conditions were all not significant ($M_{\text{post-choice-closed}} = 0.67$, $SD = 0.68$; $M_{\text{not-closed}} = 0.54$, $SD = 0.66$; $M_{\text{pre-choice-closed}} = 0.57$, $SD = 0.85$; all $F < 1$, NS; see fig. 7).

We tested the mediating role of comparison engagement in the relationship between choice-closure trigger and outcome satisfaction with a mediated moderation model (model 2, Preacher et al. 2007; see also Muller et al. 2005) in which choice moderated the effect of the choice-closure trigger (the independent variable) on comparison engagement (the mediator), and comparison engagement had a direct influence on satisfaction (the dependent variable).

Given that the analyses of variance on comparison engagement and choice satisfaction revealed no differences between the not-closed and the pre-choice-closed conditions but significant differences between these two conditions and the post-choice-closed condition, we used two orthogonal

FIGURE 6

STUDY 3B: INTERACTIVE EFFECT OF CHOICE-CLOSURE TRIGGER AND CHOICE ON SATISFACTION

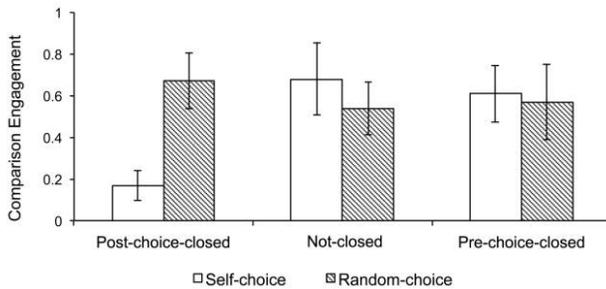


NOTE.—The error bars represent standard errors.

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FIGURE 7

STUDY 3B: INTERACTIVE EFFECT OF CHOICE-CLOSURE TRIGGER AND CHOICE ON COMPARISON ENGAGEMENT



NOTE.—The error bars represent standard errors.

contrasts. The first contrast compared the not-closed condition with the pre-choice-closed condition, whereas the second contrast compared the average of not-closed and pre-choice-closed conditions with the post-choice-closed condition. We used dummy variables to code these two contrasts. The dummy codes for the first contrast were -1 , 1 , and 0 to indicate the not-closed, pre-choice-closed, and post-choice-closed conditions, respectively. The dummy codes for the second contrast were -1 , -1 , and 2 to indicate the not-closed, pre-choice-closed, and post-choice-closed conditions, respectively. We predicted that comparison engagement would act as a mediator only when the post-choice-closed condition was compared with the combined not-closed and pre-choice-closed conditions but not when the not-closed condition was compared with the pre-choice-closed condition. To account for the two levels of the choice-set size manipulation, we coded the choice-set size as 1 , 0 to indicate the self-choice and random-choice conditions, respectively.

In order to test the significance of the indirect effects of the comparison-engagement mediator, we conducted two separate BC bootstrapping analyses (Hayes 2013) for the two orthogonal contrasts. In the first contrast, the indirect effects (based on 5,000 bootstraps) tested at both levels of choice (self vs. random) revealed that comparison engagement did not mediate the relationship between the choice-closure trigger and satisfaction either in the self-choice (95% BC bootstrap CI of -0.1071 to 0.1539 , with an estimate of 0.0108) or in the random-choice (95% BC bootstrap CI of -0.1458 to 0.0983 , with an estimate of -0.0103) conditions. The second BC bootstrap analysis with 5,000 samples showed that the indirect effect was significant in the self-choice condition (95% BC bootstrap CI of 0.0327 to 0.2389 , with an estimate of 0.1135) but not in the random-choice condition (95% BC bootstrap CI of -0.1519 to 0.0401 , with an estimate of -0.0297). These results show that comparison engagement mediated the effect of choice-closure trigger on satisfaction only when the act of closing was performed after (rather than before) making a choice and when

the choice was self-made (rather than made at random by another).

Discussion

Studies 3a and 3b showed that in order for the act of closing to affect satisfaction with a decision outcome, it must map onto the concept of choice-closure process. This choice-closure process refers to a decision-making context in which one perceives a decision to be complete and overcomes the tendency to compare an outcome that has been personally chosen with alternatives that have been personally rejected. Thus, if the act of closing is not performed by the decision maker, or is attributed to a reason unrelated to the decision, its effect on satisfaction is mitigated. Similarly, when the act is performed before the choice or when it does not concern an alternative that was personally chosen, its positive effect on satisfaction is weakened. In study 3a, closing the menu did not yield an increase in satisfaction relative to keeping the menu open when the act of closing was performed by the experimenter or when participants were given a decision-unrelated reason for that act. In study 3b, closing the menu did not increase satisfaction when participants put the lid back on the tray before making their choice or when the consumed biscuit was not the one they had personally chosen.

Study 3b also provided additional empirical evidence for the choice-closure process by showing that the effect of the physical acts of closure on satisfaction was mediated by the number of comparisons that were spontaneously mentioned by the participants.

GENERAL DISCUSSION

In this article we investigated the process by which consumers come to perceive a decision as complete, limit comparisons between the chosen and the forgone options, and as a result experience greater satisfaction with the outcome of difficult choices. Four studies demonstrated that acts of closure—such as covering the rejected alternatives with a transparent lid or closing a menu describing these alternatives—facilitate choice closure in the context of choices made from extensive choice sets. Study 1 showed that an act of closure increased satisfaction with a choice made from a larger (vs. a smaller) set, and that this effect was explained by the choice-closure process. Study 2 demonstrated that simulating the comparison-engagement element of the choice-closure process through encouraging an isolated (vs. comparative) evaluation mode had the same effect as performing the act of closure. Studies 3a and 3b revealed that not all acts of closure facilitate choice closure: a positive effect on satisfaction requires a direct mapping between the elements of the physical act and those of the mental process of closure.

The concept of choice closure introduced in this article builds on, and contributes to, several streams of research. First, the initial study adds to the growing body of literature on the psychological process underlying choice overload (for a review, see Broniarczyk 2008). Based on our findings,

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choice overload is more likely to occur in the absence of an external intervention that makes the forgone options mentally unavailable. Such an intervention, even in the form of subtle acts that do not alter the choice setting, could mitigate the choice overload effect. Second, by showing that participants' satisfaction was affected by the acts of closure while controlling for material and cognitive accessibility to the forgone options, in this article we extend the research on decision irreversibility and the effect of counterfactual thinking on choice overload (Gilbert and Ebert 2002; Hafner et al. 2012). Finally, we contribute to research on psychological closure (Beike et al. 2007; Li et al. 2010), as we suggest that a sense of closure can be reached not only by inhibiting direct access to negative emotions associated with past experiences but also by avoiding processes (i.e., unfavorable comparisons) that may lead to such negative emotions.

Future research can investigate the relationship between choice closure and need for closure (Kruglanski 1989, 1990), which is a measure of individuals' tendency to generate arguments in favor of or against a topic. Individuals with low need for closure have a greater propensity than those with high need for closure to gather and process information and are therefore less confident about their judgments (Maysless and Kruglanski 1987). Thus, future research may examine whether decision makers with low (vs. high) need for closure are less likely to experience choice closure and (similar to our participants in the large-set condition) are in greater need of an external intervention that can facilitate closure.

We investigated the positive effect of choice closure on satisfaction in a specific context, choosing from extensive assortments. Low satisfaction with a choice made from a large set can be driven either by a general feeling that the selected option may not be the best one or by an analytical comparison process that reveals the presence of similar options in the set (Luce 1998). However, in both cases consumers' low satisfaction is determined by a lower confidence in having made the best choice, which in turn increases the tendency to revisit the decision. Because acts of closure facilitate choice closure by enabling consumers to overcome this tendency and by inhibiting further comparisons, we believe that choice closure would be beneficial regardless of the specific decision process employed by consumers faced with large sets. For the same reason, we argue that our results can be generalized to other difficult decisions as long as these are associated with lower confidence. Clearly, more research is needed to validate this argument.

Finally, future research could examine the durability and resistance of choice closure to subsequent counter information. Litt and Tormala (2010) showed that dissonance reduction mechanisms that generally follow difficult decisions are fragile. Thus, post-choice negative information is more likely to undo satisfaction when the choice is difficult, rather than easy. Because this effect is attributed to the greater uncertainty associated with difficult decisions, it is possible that the boost offered by choice closure is also short lived. We believe, however, that the effect of choice closure

may be rather persistent, as it eliminates a key source of the dissatisfaction: unfavorable comparisons. In any case, it is interesting to study what would happen if consumers who have closed a decision were forced to reopen it, as in the case of a restaurant diner who, after closing his menu, is approached by the waiter with a list of the specials. Would the diner resist the reopening possibility, ignore the specials, and be happy with his choice, or would he reopen the closed decision and experience even greater dissatisfaction because of the failed closure attempt?

From a managerial perspective, the construct of choice closure may help finalize a sale or increase post-purchase satisfaction. When a consumer must decide between numerous options, for example, she may start to prefer one over the others. Would the sale be facilitated if the salesperson led the consumer into performing a physical act that is metaphorically associated with closure, for example turning her back on the options' display or moving the preferred item to a separate location? Similarly, in an online setting, would a website requiring buyers to click and cancel the many options that were not selected increase satisfaction with the chosen option and reduce the likelihood that it would be returned? More generally, the notion that subtle acts of closure can increase consumers' subjective evaluation of a decision outcome has beneficial practical implications when the difficulty of the choice cannot be actually reduced. For example, research has shown that even when more options negatively affect subjective well-being, consumers desire large choice sets (Botti and Hsee 2010; Iyengar and Lepper 2000). Thus, managers may be reluctant to reduce the size of their assortments for fear of not attracting enough customers, and may therefore end up dealing with unhappy ones. In other cases, assortment reductions can be physically impossible or costly to perform. In all these circumstances, satisfaction with a difficult choice could be improved by simple acts that allow consumers to make peace with their choices without changing the actual context in which those choices were made.

The movie *It's Complicated* ends with Jane and Adam, her new partner, laughing and walking into her house. Although this life-changing finale may not be entirely attributed to her covering the cake, after submitting this file we will shut down our computers, turn our backs on our desks, and close our office doors. We feel better already.

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