

Nonconscious Nudges: Encouraging Sustained Goal Pursuit

JULIANO LARAN
CHRIS JANISZEWSKI
ANTHONY SALERNO

A person can use a variety of strategies to sustain the pursuit of a conscious goal (e.g., deliberate on the goal, monitor goal progress, increase goal commitment). However, less is known about how to sustain the pursuit of a nonconscious goal, a reality that is reflected in the common finding that nonconscious goal pursuit typically persists for only one choice episode. **This research investigates two factors that help sustain the pursuit of a nonconscious goal: increasing the level of goal activation prior to goal pursuit and limiting the extent of goal deactivation after a goal-consistent behavior.** When one of these two factors is present, nonconscious goal pursuit is sustained, as evidenced by a longer sequence of goal-consistent choices. Five studies compare and contrast strategies for sustaining conscious and nonconscious goal pursuit and provide insight into how the goal system manages the pursuit of a nonconscious goal. In addition, the findings inform when a consumer is more or less likely to pursue opposing goals across sequential choices (e.g., being virtuous after being indulgent).

Keywords: nonconscious goal pursuit, conscious goal pursuit, sequential choices, consumer well-being

Consider two supermarket shoppers. Shopper 1 has a conscious goal to be healthy. This shopper easily selects products that are consistent with the health goal (e.g., fruit, vegetables, granola bars, low-fat yogurt). Shopper 2 has a nonconscious goal to be healthy. Shopper

2 is unaware of the health goal, as it was incidentally activated when the shopper passed through the produce section. This shopper will have a more difficult time selecting items that are consistent with the health goal. Prior research suggests that a single goal-consistent choice will deactivate the nonconscious goal and result in subsequent choices that are inconsistent with the goal (Chartrand et al. 2008b; Liberman and Förster 2000; Macrae et al. 1994; Marsh, Hicks, and Bink 1998). This research investigates factors that help sustain the influence of the nonconscious goal during shopper 2's shopping trip.

The supermarket shopping example illustrates two perspectives that characterize research on goal pursuit. The first perspective assumes conscious thoughts are necessary for goal activation and pursuit (Bandura 1997; Miller, Galanter, and Pribram 1960). The literatures on goal setting (Locke and Latham 1990), planning (Gollwitzer 1999), and monitoring (Carver and Scheier 1982) are consistent with this perspective. The second perspective assumes conscious thoughts are not necessary for goal activation and pursuit (Pockett, Banks, and Gallagher 2009; Wegner 2002). Instead, environmental stimuli can activate

Juliano Laran (laran@miami.edu) is a professor of marketing, University of Miami, Coral Gables, FL, 33124-6524. Chris Janiszewski (chris.janiszewski@warrington.ufl.edu) is the Russell Berrie Eminent Scholar Chair and Professor of Marketing, Warrington College of Business Administration, University of Florida, Gainesville, FL 32611-7155. Anthony Salerno (anthony.salerno@uc.edu) is an assistant professor of marketing, Carl H. Lindner College of Business, University of Cincinnati, Cincinnati, OH, 45221-0145. Please address correspondence to Juliano Laran. The authors thank Steven Sweldens and Yang Yang for their helpful comments on previous drafts of this article. The authors also acknowledge the helpful input of the editors, associate editor, and reviewers. Supplementary materials are included in the web appendix accompanying the online version of this article. All authors contributed equally to this work.

Editors: Gita V. Johar and Margaret C. Campbell

Associate Editor: Cait Lambertson

Advance Access publication October 8, 2018

goals without a person's awareness, and these goals initiate automatic processes that guide behavior (Bargh 1990, 2008; Bargh et al. 2001). Conscious thought can still guide behavior, but only when nonconscious goal pursuit is ineffective (Bargh 1990; Chartrand, Dalton, and Cheng 2008a). This perspective refers to goals as *conscious/non-conscious* when people are aware/unaware that the goal is active.

An emerging perspective takes a different approach to goal pursuit, positing that both conscious and nonconscious goals are instrumental in adaptive decision-making (Huang and Bargh 2014; Laran, Janiszewski, and Salerno 2016; Williams and Poehlman 2017). This new perspective puts conscious and nonconscious goals on an equal footing, assuming that either type of goal can guide behavior, even if this occurs in different ways. To appreciate this implication, consider situations in which consumers make a series of choices, such as in the supermarket example described above. Prior research has shown that conscious awareness of a goal helps sustain its influence over a series of choices (Kivetz, Urminsky, and Zheng 2006; Vohs 2010), whereas a nonconscious goal typically influences a single choice (Chartrand et al. 2008b; Marsh et al. 1998). The idea that both types of goals must be able to guide behavior suggests that a nonconscious goal should also be able to influence a series of choices. Yet the antecedents that help sustain nonconscious goal pursuit must be different from the antecedents that help sustain conscious goal pursuit, as nonconscious goal pursuit cannot rely on conscious thought, monitoring, or vigilance. The current research identifies antecedents (nudges) that help sustain nonconscious goal pursuit.

We begin with the premise that nonconscious goal pursuit is guided by the activation of a focal goal (Bargh et al. 2001), the inhibited activation of opposing goals (Shah, Friedman, and Kruglanski 2002), and the release of a focal goal subsequent to goal-consistent behavior (Laran and Janiszewski 2009). Accordingly, we show that the pursuit of a nonconscious goal can be sustained (i.e., the goal is not released) if the decision-making context allows for (1) an increased amount of goal activation prior to behavior or (2) a decreased amount of goal deactivation subsequent to a goal-consistent behavior. By examining sustained goal pursuit, this research is relevant to situations where conscious or nonconscious goals can influence more than one choice.

SUSTAINING CONSCIOUS GOAL PURSUIT

A number of goal models describe how people actively prioritize and execute behavior (Field Theory, Lewin and Cartwright 1951; T.O.T.E. Model, Miller et al. 1960; Control Theory, Carver and Scheier 1982; Goal Setting

Theory, Locke and Latham 1990; Goal Systems Theory, Kruglanski et al. 2002; Goal-based Choice Model, van Osselaer and Janiszewski 2012). Almost all of these models speak to situations in which there are opposing goals (e.g., work vs. play, eat healthy food vs. eat tasty food, save vs. spend, act vs. procrastinate). For example, people can prioritize the pursuit of a self-regulatory goal (e.g., eat a healthy diet) and limit the influence of a hedonic goal (e.g., eat tasty snacks), or prioritize the pursuit of a hedonic goal (e.g., have a relaxing vacation) and limit the influence of a self-regulatory goal (e.g., work).

Many models of conscious goal pursuit assume goal pursuit is sustained via an active process (Carver and Scheier 1982; Locke and Latham 1990; Miller et al. 1960). Conscious thought aids goal pursuit by keeping the goal in working memory (i.e., keeping the goal active). The effective pursuit of a conscious goal depends on (1) successfully monitoring the environment for situations in which the goal can be executed (Carver and Scheier 2008; Quinn et al. 2010), (2) developing a plan to sustain activation of the goal (Cheema and Bagchi 2011; Gollwitzer et al. 2010), and (3) garnering the mental resources needed to execute the plan (Muraven and Baumeister 2000). As long as a person has the necessary resources, and no intervening factor (e.g., a need for variety) is present, the person should be able to pursue the goal when the opportunity arises and, consequently, limit the influence of opposing goals (Kivetz and Simonson 2002; Vohs 2010).

SUSTAINING NONCONSCIOUS GOAL PURSUIT

A number of goal models describe how people passively prioritize and execute behavior (Ideo-motor Theory, James 1890; Action-control Model, Norman and Shallice 1986; Automotive Model of Nonconscious Goal Pursuit, Bargh 1990; Theory of Event Coding, Hommel et al. 2001; Passive Goal Guidance Model, Laran and Janiszewski 2009). These models speak to situations where contextual cues directly motivate goal-consistent behaviors or where contextual cues activate goals that are then prioritized and pursued given the available means. In general, people are unaware of events that make the goal active and/or of the fact that they are selecting means consistent with the active goal (Bargh and Chartrand 2014; Dimofte 2016).

Despite a large number of demonstrations that a nonconscious goal can influence behavior, research does not usually examine whether the influence of the goal is sustainable over a series of behaviors (Ferguson and Bargh 2004; Fitzsimons, Chartrand, and Fitzsimons 2008; Laran, Dalton, and Andrade 2011; Laran, Janiszewski, and Cunha 2008; Macrae et al. 1994). When investigations of nonconscious goals do include more than one behavior, the second behavior is typically inconsistent with the activated goal

(Chartrand et al. 2008b; Laran 2010; Liberman and Förster 2000; Macrae et al. 1994; Marsh et al. 1998). For example, Chartrand et al. (2008b; study 3) found that the nonconscious activation of a prestige-seeking goal encouraged an initial prestige-oriented choice (e.g., most people picked Tommy Hilfiger socks over Hanes socks) but a subsequent value-oriented choice (e.g., most people picked a Timex watch over a Guess watch). **The implication is that when consumers are not aware that a goal is active, goal pursuit will not be sustained over time.**

Insights into how to sustain nonconscious goal pursuit are provided by the passive goal guidance model (Laran and Janiszewski 2009). Laran and Janiszewski (2009) show that engagement in nonconscious goal pursuit depends on the relative activation of competing goals, wherein the most active goal is prioritized by the inhibition of opposing goals. Pursuit of a nonconscious goal ceases when a goal-consistent behavior signals that goal pursuit has been successful. **Successful goal pursuit results in the deactivation of the pursued goal and the increased pursuit of previously inhibited goals** (i.e., a rebound effect). Laran and Janiszewski (2009) conclude that nonconscious goal pursuit is a function of how relative goal activations change over time. The implication is that interventions that influence the relative activation of nonconscious goals could influence how long the goals are pursued. We propose that two factors may influence relative goal activation and sustained goal pursuit: (1) an increase in the activation of the goal prior to or during goal pursuit or (2) a decrease in the deactivation of the goal following a goal-consistent behavior.

The Role of Increased Goal Activation

We propose that the higher the initial activation of a nonconscious goal, the greater the likelihood that additional choices will be consistent with the goal. This should occur because a higher level of prechoice, nonconscious goal activation should result in a higher level of post-choice, nonconscious goal activation. The higher the level of postchoice goal activation, the less likely it is that the activation of the nonconscious goal will fall below that of competing goals. Thus, the nonconscious goal will remain active enough to influence a subsequent choice.

Increased initial conscious goal activation should not have a similar influence on conscious goal pursuit. Conscious goal pursuit involves goals that consumers maintain in working memory. In general, the activation of a conscious goal is sustained via its rehearsal in working memory, provided external factors do not interfere with this rehearsal process. Consequently, an increase in initial conscious goal activation should not impact the choices that are made in response to the goal activation. We do acknowledge that there are situations in which conscious goal pursuit does not lead to sustained, goal-consistent

choice (i.e., when there are inferences of sufficient goal progress, variety seeking, goal failure, or goal abandonment). These findings reflect conscious, metacognitive decisions to disengage from goal pursuit. We, however, manipulate conscious goal pursuit in a way that minimizes metacognitive thought about goal pursuit. This allows us to investigate how keeping a conscious goal in working memory compares to activating a nonconscious goal.

There are two potential ways to increase the activation of a nonconscious goal during goal pursuit. First, it is possible to increase goal activation before an initial choice. For example, goals become more active when there is a short delay between goal activation and the opportunity to act on the goal (Bargh et al. 2001; Fitzsimons et al. 2008; Sela and Shiv 2009). Delay-based activation occurs because a delay frustrates goal pursuit, increasing goal activation due to goal escalation (Bargh et al. 2001; Chartrand et al. 2008a, 2008b). Thus, we expect that a short delay in the opportunity to act on a nonconscious goal will help sustain goal pursuit. Importantly, because the activation of the goal is increasing *before* an initial choice, it should be capable of sustaining goal activation only for a limited number of choices (i.e., one additional choice episode), after which there should be a rebound effect.

H1: A delay between nonconscious goal activation and an initial choice will increase the number of sequential choices that are consistent with a nonconscious goal, but not influence the number of sequential choices that are consistent with a conscious goal.

A second way to sustain the activation of a nonconscious goal is to continuously reactivate the goal. To understand how one might do this, it is important to note that nonconscious goals are often primed prior to a person encountering an environment where the goal can be pursued (Huang and Bargh 2014). For this reason, nonconscious goal activation orients a person's attention toward goal-consistent means when these means are encountered (Laran et al. 2008; Memelink and Hommel 2013; van der Laan et al. 2017), which further increases the activation of the nonconscious goal (van Osselaer and Janiszewski 2012). This goal reactivation effect relies on means-to-goal activation, which allows a means to make an associated goal more accessible (de Lange et al. 2012; Kay et al. 2004; Shah and Kruglanski 2003). This increased goal activation, in turn, increases the likelihood of successful goal pursuit (Strahan, Spencer, and Zanna 2002). This evidence suggests that as the number of available goal-consistent means increases (e.g., goal-consistent means increase from five to 10 alternatives), the activation of the nonconscious goal should increase, and lead to an increase in the number of goal-consistent sequential choices.

H2: An increase in the number of goal-consistent means will increase the number of sequential choices that are consistent

with a nonconscious goal, but not influence the number of sequential choices that are consistent with a conscious goal.

The Role of Limited Goal Deactivation

The goal rebound effect occurs when the goal system considers the goal satisfied, which deactivates the goal and leads to the pursuit of an opposing goal (Chartrand et al. 2008a; Laran and Janiszewski 2009; Liberman and Förster 2000; Marsh et al. 1998; Macrae et al. 1994). Thus, limiting the deactivation of a nonconscious goal postchoice should help sustain nonconscious goal pursuit and increase the number of goal-consistent choices.

One way to limit goal deactivation is by framing the scope of a behavior. Behaviors can vary in intensity (e.g., choosing a mildly sweet vs. very sweet dessert) and resolution (e.g., eating a bite vs. a serving of food). Applied to the context of sequential choice, this implies that a behavior framed as “multiple choices equal one behavior” could have as much impact on goal deactivation and subsequent goal pursuit as a behavior framed as “one choice equals one behavior.” Behavior framing should be particularly effective for nonconscious goals because of their imprecise representation (e.g., save money vs. save \$1,200). Consistent with this reasoning, framing a goal-consistent behavior as ongoing does not reduce the activation of a goal (Laran and Janiszewski 2009). In addition, discouraging people from disaggregating behavior into distinct acts encourages more goal pursuit (Nunes and Drèze 2006; Wansink, Painter, and North 2005). Thus, as long as consumers see choices as part of the same behavior, they should not deactivate the goal after making each individual choice, and the number of goal-consistent choices should increase. Importantly, this strategy should not increase the number of goal-consistent choices when a goal is conscious. For the reasons discussed earlier, we operationalize conscious goal pursuit so as to ensure that it remains active in working memory. This means that the conscious goal will not become deactivated, and limiting goal deactivation will therefore not benefit goal-consistent choices.

H3: Framing a series of choices as part of the same choice event will increase the number of sequential choices that are consistent with a nonconscious goal, but not influence the number of sequential choices that are consistent with a conscious goal.

A second way to limit goal deactivation is to interfere with adjustments to goal activation subsequent to goal-consistent behavior. Nonconscious goal pursuit can be represented by the following behaviors: (a) compare the activation of currently accessible goals, (b) prioritize the most active goal by inhibiting competing goals, (c) engage in goal-consistent behavior, and (d) make a postchoice adjustment to goal activation. Although there is no documented evidence that step (d) is resource-dependent, there

is evidence that nonconscious goal pursuit may use resources. For example, nonconsciously primed conflicting goals (e.g., academic preparation, socializing) reduce performance on a resource-demanding task (e.g., proofreading; Marien et al. 2012), and unaddressed nonconscious goals (e.g., resolve anxiety) interfere with tasks that require cognitive control (e.g., a math test; Johns, Inzlicht, and Schmader 2008; Schmader, Johns, and Forbes 2008). Moreover, step (d) involves switching between two competing goals. Switching is resource-dependent. Switching among two mindless tasks (e.g., simple addition and subtraction) requires more cognitive resources than sustaining a single task (e.g., simple addition or subtraction; Monsell 2003; Rubinstein, Meyer, and Evans 2001). In addition, performing sequential tasks associated with different (vs. similar) goals requires more intricate control processes, which uses more cognitive resources (Botvinick et al. 2001).

Thus, we propose that a cognitive load can influence the availability of resources needed to make adjustments to nonconscious goal activation. The evidence discussed above clearly suggests that nonconscious goal processes may involve some amount of resources, and that continuing on the same course of action involves fewer resources than switching one's orientation. Given that rebound effects involve conflicting goals and require task switching, it is plausible to hypothesize that a lack of resources would attenuate nonconscious goal deactivation subsequent to goal-consistent behavior and, consequently, help sustain goal pursuit. In contrast, conscious goal pursuit should respond to limited resources by not being able to keep the goal in working memory, as working memory is now preoccupied. As a result, cognitive load should limit a person's ability to sustain goal activation and pursuit.

H4: An increase in cognitive load will increase the number of sequential choices that are consistent with a nonconscious goal, but decrease the number of sequential choices that are consistent with a conscious goal.

In summary, we observe that the pursuit of a nonconscious goal is often characterized by a goal-consistent behavior followed by a goal-inconsistent behavior. We will use the strategies we have identified to increase the number of sequential choices that are consistent with a nonconscious goal. Five studies show that a delay between goal activation and choice (study 1), an increase in the number of goal-consistent means in the choice set (study 2), framing a series of choices as part of the same behavior (study 3), and cognitive load (studies 4 and 5) help sustain pursuit of a nonconscious goal.

STUDY 1

Nonconscious goal activation often encourages a goal-consistent choice, followed by a goal-agnostic or goal-

inconsistent subsequent choice (i.e., a goal rebound effect). In study 1, we wanted to increase the number of choices influenced by a nonconscious goal. Our strategy was to introduce a delay between the activation of a nonconscious goal and a sequence of choices. A delay should increase the activation of the nonconscious goal (Fitzsimons et al. 2008; Laran et al. 2008; Sela and Shiv 2009) and, consequently, increase the number of choices that are consistent with the nonconscious goal (hypothesis 1). That is, goal-consistent choice shares should remain above 50% for a greater number of choices when there is a delay (e.g., choice 1 and choice 2 are goal-consistent) versus no delay (e.g., choice 1 is goal-consistent). We investigated these predictions using tasty versus healthy food choices.

Method

Participants and Design. Participants were 865 undergraduate students (60% female, $M_{\text{Age}} = 20.35$) who participated in exchange for course credit. This was the final sample after exclusion criteria were applied, as 60 participants were excluded for failing to follow study instructions (see criteria below). The study had a 2 (goal state: nonconscious vs. conscious) \times 2 (goal type: hedonic vs. health) \times 2 (delay: no delay vs. delay) between-subjects design. In addition, no goal control—no delay and no goal control—delay conditions were added. The purpose of the two control conditions was to confirm that, at baseline, (1) the choice set consisted of equally liked tasty and healthy foods (i.e., people did not significantly prefer one type of food), and (2) the delay task did not have an independent influence on choices. Choice occasion was a within-subjects factor, represented by five sequential choices for each participant.

Procedure. Participants entered the behavioral lab and were seated in front of personal computers. Each participant engaged in four tasks: a nonconscious goal priming or control task, a conscious goal instantiation or control task, a delay task, and a sequential choice task (see [web appendix A](#) for experimental manipulations and measures). The order in which these four tasks were completed varied by condition. In the nonconscious goal condition, participants first completed the control task version of the conscious goal instantiation task and then the nonconscious goal priming task. In the conscious goal condition, participants first completed the control task version of the nonconscious goal priming task and then the conscious goal instantiation task. In the control condition, the order in which they completed each control task was randomized. In the delay (no delay) condition, participants completed the delay task just prior to (just after) the sequential choice task.

The nonconscious goal priming or control task was described as a “Cognition Study” that examined people’s ability to form sentences. Depending on condition,

participants unscrambled 10 five-word sentences that either primed a nonconscious goal or served as a control activity (Srull and Wyer 1979). In the nonconscious hedonic goal condition, each sentence contained a word consistent with a hedonic goal (i.e., flavor, food, tasty, enjoyable, pleasure, delicious, delightful, indulge, desserts, savor), whereas in the nonconscious health goal condition, each sentence contained a word consistent with a health goal (i.e., healthy, fat, weight, fit, slim, shape, discipline, willpower, exercise, workout). In the conscious goal and control conditions, the priming words were replaced with neutral words (i.e., walk, perpendicular, delay, water, below, woods, bored, compute, sailboat, grocery). Participants were thanked for their participation in the first study after unscrambling the 10 sentences.

The conscious goal instantiation or control task was labeled “Understanding Scientific Research,” adapted from previous research (Laran, Janiszewski, and Salerno 2016; McFerran and Mukhopadhyay 2013). In the conscious goal condition, participants were told that the purpose of the task was to examine students’ ability to summarize and apply research findings to decision-making in their everyday lives. They were then asked to read an abstract that purportedly came from a published scientific journal article. The abstract described what food attributes are most important for having the best consumption experience, and parts of the abstract differed depending on the goal type condition. In the conscious hedonic (health) goal condition, participants read that “consumers who were the most satisfied in their consumption experience placed a great deal of emphasis on making sure that, above all else, the food was tasty (healthy)” and that other attributes were not as important “as how tasty (healthy) the food was.” After reading the abstract, participants were shown a multiple-choice question and asked to select the answer that best summarized the main finding from the research (once participants provided a response, they were shown the correct answer). Critically, participants were then told that they would have an opportunity to apply this research finding to their own decision-making with an opportunity to make real food choices. Participants were then shown a statement that said, “I agree to apply what I learned from the research towards my food choices.” They clicked on the statement if they agreed (agreement was above 96% and did not vary across conditions). In the nonconscious goal and control conditions, the format of the task was similar except that participants (1) were asked only to select the answer from the multiple-choice question that best summarized the research, not asked to apply it to their decision-making, and (2) the abstract was from a published article on the role of truth in social groups (Friedkin and Bullo 2017).

The delay task was described as an activity that gave participants a break from staring at the computer screen. At each participant’s desk were a pen and a sheet of paper that contained a passage taken from a statistics textbook.

Consistent with prior research (Fitzsimons et al. 2008; Zemack-Rugar, Bettman, and Fitzsimons 2007), the text was selected because it was neutral in content and unrelated to the other tasks in the session. Participants were instructed to cross out all instances of the letter “e” from the passage on the sheet of paper. Participants were given five minutes to complete the task and were explicitly told that performance on the task would not be evaluated. After the five minutes had passed, they were instructed to look back to the computer screen, which had been programmed to automatically move forward to the next portion of the session.

At the start of the sequential choice task, participants were notified that they would receive snacks in appreciation for their participation. Participants then chose five snacks, with replacement, from a set of 10 options. The set was listed on the computer screen and was organized into two columns, each consisting of five snacks. Five of the snack options were tasty, indulgent foods that represented the goal-consistent options for a hedonic goal. These five snacks were randomly selected from a larger pool of 10 tasty, indulgent snacks (Snickers, Reese’s Cup, Almond Joy, Milky Way, 3 Musketeers, Twizzlers, Sour Punch Straws, Skittles, Airheads, and Starburst Fruit Chews). This was a strategic decision, as larger sets of stimuli would be needed in study 2. The remaining five options were healthy snacks (Special K Protein Bar, Special K Strawberry Bar, Kellogg’s Nutri Grain Bar, Veggie Straws, and Kind Cashew Granola Bar) that represented options consistent with a health goal. The screen arrangement of the five tasty and five healthy snacks was randomized for each participant. To make a choice, participants clicked on the snack they wanted and then clicked a continue button. Once they made their choice, the next screen indicated that their prior choice was successfully submitted by thanking them and then asking them to make another snack choice from the same set of 10 options. They repeated this process five times.

Prior research has demonstrated that goal rebound effects are more likely to occur following a real, as opposed to hypothetical, goal-consistent choice (Chartrand et al. 2008b). For this reason, we took three important steps to ensure that participants saw the snack choices as consequential. First, participants were told that a lottery would determine if they received one, two, or three snacks from the set of five that they chose. They would collect these snacks at the end of the session. Second, the snacks were in plain sight when participants entered the lab (the product display was to the left of the entry door). Third, prior to making their choices, participants were invited to leave their desk and examine the snacks (we did not keep track of which participants examined the snacks). Few participants left their desk, though some did turn to look at the back of the room. The distance from the desk of each participant to where the snacks were located ranged from 10

to 50 feet. After making their choices, participants were asked, “What was your goal when making these choices?” (1 = Only pick healthy items, 9 = Only pick tasty items), as a manipulation check for the goal manipulation.

After completing these tasks, participants answered demographic questions, were debriefed for suspicion, were notified of how many snacks they had won, and collected their food. In this and subsequent studies, we conducted additional analyses that accounted for potential hypothesis guessing among participants in the nonconscious goal conditions. We coded participants who varied in their awareness of a priming theme in the nonconscious goal priming task or their awareness of how the priming task might have influenced their thoughts and behavior. Across all studies, awareness did not have a consistent influence on behavior. The full reporting of these analyses can be found in [web appendix F](#).

In each study in this article, we excluded participants if they failed (1) to follow the instructions during the goal priming task or (2) an attention check (Oppenheimer, Meyvis, and Davidenko 2009). The failure to follow instructions during the priming task was reflected either in participants writing a single word or nonsense letters into the response box (e.g., “was,” “ewr”) or by participants writing sentences with words that were not in the trial (e.g., “this sentence is jumbled”). The attention check consisted of a single question on its own page that stated, “Please select not at all for this question” (1 = Not at all, 9 = A great deal). Participants that selected “1” passed the attention check. Across all studies, the frequency of people who were excluded based on these criteria was not significantly different as a function of condition.

Results

Pretesting. A pretest ($n = 54$) showed that although the tasty and healthy snacks were liked similarly (1 = Not at all desirable, 9 = Very desirable) at baseline ($M_{\text{tasty}} = 5.90$, $SD = 1.99$ vs. $M_{\text{healthy}} = 5.55$, $SD = 1.64$; $t(53) = 1.15$, NS), the tasty snacks were seen as more indulgent (1 = Very healthy, 9 = Very indulgent) than the healthy snacks ($M_{\text{tasty}} = 7.05$, $SD = 1.67$ vs. $M_{\text{healthy}} = 4.26$, $SD = 1.54$; $t(53) = 8.53$, $p < .01$). To further support the idea that the different snacks represented competing goals (goal-consistent, goal-inconsistent), two additional pretests verified that participants with a hedonic goal or a health goal would perceive that the tasty and healthy snacks competed with each other. Specifically, participants were shown the tasty and healthy snacks from study 1 and responded to a single question that was either prefaced with “given the goal of eating tasty food” ($n = 78$) or “given the goal of eating healthy food” ($n = 78$) and then continued with “to what extent do these two sets of foods compete with each other or complement each other (1 = Complement each other, 5 = Neither complement nor

compete with each other, 9 = Compete with each other.” Compared to the midpoint of the scale (i.e., 5), participants indicated that the tasty and healthy snacks competed with each other, both when the participant had a hedonic goal ($M = 6.31$, $SD = 2.29$; $t(77) = 5.04$, $p < .01$) and when the participant had a health goal ($M = 6.99$, $SD = 1.99$; $t(77) = 8.82$, $p < .01$).

Manipulation Check. Given that there were two goals, two ANOVAs were conducted, one that compared the control conditions to the conscious and nonconscious hedonic goal conditions, and another that compared the control conditions to the conscious and nonconscious health goal conditions. When a hedonic goal was active, a main effect of goal state emerged ($F(2, 519) = 19.79$, $p < .01$, $\hat{\omega}_p^2 = .067$). Participants in the conscious goal condition were more likely to indicate having a hedonic goal while making choices ($M = 7.41$, $SD = 1.96$) than participants in the nonconscious goal condition ($M = 5.94$, $SD = 2.47$; $F(1, 519) = 38.06$, $p < .01$, $\hat{\omega}_p^2 = .066$) and the control condition ($M = 6.27$, $SD = 2.41$; $F(1, 519) = 23.56$, $p < .01$, $\hat{\omega}_p^2 = .042$). Participants in the nonconscious goal condition and control condition did not differ in their reported goal ($F < 1$). When a health goal was active, a main effect of goal state emerged ($F(2, 510) = 60.01$, $p < .01$, $\hat{\omega}_p^2 = .187$). Participants in the conscious goal condition were more likely to indicate having a health goal while making choices ($M = 3.79$, $SD = 2.36$) than participants in the nonconscious goal condition ($M = 6.13$, $SD = 2.27$; $F(1, 510) = 87.14$, $p < .01$, $\hat{\omega}_p^2 = .144$) and the control condition ($M = 6.27$, $SD = 2.41$; $F(1, 510) = 93.23$, $p < .01$, $\hat{\omega}_p^2 = .153$). Participants in the nonconscious goal condition and control condition did not differ in their reported goal ($F < 1$). In both analyses, the effect of the delay factor and the goal state by delay interaction were nonsignificant (all F s < 1).

Analysis Plan. Hypothesis 1 predicts that a time delay will increase the activation of the nonconscious goal at time 1 and help delay the onset of a rebound effect in the nonconscious goal condition. The implication is that the nonconscious-goal-consistent choice share must remain above what would be expected in the control, baseline condition (50%) for at least one additional choice in the delay condition. By contrast, the time delay should not increase the number of choices with a share above 50% in the conscious goal condition. Table 1 provides the complete sequential choice results (choice shares indicate the proportion of tasty options selected in each condition). For each of the key contrasts that follow, Cohen’s h was used as a measure of effect size because it is insensitive to sample size. The interpretation of Cohen’s h is similar to Cohen’s d , in that .2 is a small effect size, .5 is a medium effect size, and .8 is a large effect size.

First Choice. The first choices were analyzed to ensure that the goals influenced choice and that the time delay

increased choice share—an indicator that the delay increased goal activation (see table 1). For the hedonic goal, the choice share of tasty options was higher in the delay condition than in the no delay condition for the conscious goal ($p_{\text{delay}} = 83.5\%$, $p_{\text{no delay}} = 70.0\%$; $z = 2.11$, $p < .05$, Cohen’s $h = .323$) and the nonconscious goal ($p_{\text{delay}} = 84.9\%$, $p_{\text{no delay}} = 67.0\%$; $z = 2.76$, $p < .01$, Cohen’s $h = .426$). For the health goal, the choice share of tasty options was lower in the delay condition than in the no delay condition for the conscious goal ($p_{\text{delay}} = 13.1\%$, $p_{\text{no delay}} = 27.1\%$; $z = -2.27$, $p < .05$, Cohen’s $h = -.354$) and the nonconscious goal ($p_{\text{delay}} = 18.6\%$, $p_{\text{no delay}} = 34.1\%$; $z = -2.30$, $p < .05$, Cohen’s $h = -.355$).

Second Choice. The second choices were analyzed to assess if the influence of the goal was sustained, especially in the nonconscious–delay condition (hypothesis 1). For the hedonic goal, the choice share of tasty options in the nonconscious–delay condition was higher than in the control condition ($p_{\text{delay}} = 75.6\%$, $p_{\text{control}} = 51.1\%$; $z = 3.37$, $p < .01$, Cohen’s $h = .516$), but the choice share in the nonconscious–no delay condition was lower than in the control condition ($p_{\text{delay}} = 34.1\%$, $p_{\text{control}} = 48.8\%$; $z = -1.97$, $p < .05$, Cohen’s $h = -.300$). For the health goal, the choice share of tasty options in the nonconscious–delay condition was lower than in the control condition ($p_{\text{delay}} = 27.9\%$, $p_{\text{control}} = 51.1\%$; $z = -3.15$, $p < .01$, Cohen’s $h = -.480$), but the choice share in the nonconscious–no delay condition was marginally higher than in the control condition ($p_{\text{delay}} = 62.4\%$, $p_{\text{control}} = 48.8\%$; $z = 1.79$, $p < .10$, Cohen’s $h = .275$). Thus, goal pursuit was sustained in the delay conditions, but rebound occurred in the no delay conditions. Participants made goal-consistent choices in the conscious goal conditions regardless of goal or delay condition (see table 1).

Remaining Choices. A delay could not sustain goal-consistent choice past the second choice in the nonconscious–delay conditions, as the third choice showed a nonsignificant goal rebound effect for those primed with a hedonic goal (38.4%; $z = -1.55$, $p = .128$, Cohen’s $h = -.234$) and a significant effect for those primed with a health goal (66.3%; $z = 2.19$, $p < .05$, Cohen’s $h = .332$). Note that the rebound effect, collapsed across goal type, was significant ($z = 2.22$, $p < .05$, Cohen’s $h = .283$). The third, fourth, and fifth choices were significantly above chance (i.e., compared to the control condition) in the conscious goal conditions, suggesting that goal pursuit was sustained (see table 1 for all choice shares and statistics).

Ancillary Analysis. We conducted the previous analyses at the aggregate level by comparing the overall proportion of goal-consistent choices as a function of condition. Yet our hypotheses predict that sustained goal pursuit and rebound effects should manifest at the individual level. Therefore, we used a Poisson regression to compare the

TABLE 1
STUDY 1 SEQUENTIAL CHOICE RESULTS (SHARE OF TASTY OPTIONS)

	Sample (n)	Choice 1	Choice 2	Choice 3	Choice 4	Choice 5
Control–No delay ^a	86	50.00	48.80	52.30	50.00	54.70
Share vs. Prev. choice ^b			–0.16	0.46	–0.30	0.62
Control–Delay	90	48.90	51.10	50.00	50.00	52.20
Share vs. Prev. choice			0.30	–0.15	0.00	0.30
Hedonic goal						
Nonconscious–No delay ^a	88	67.00	34.10	46.60	52.30	51.10
Share vs. Prev. choice ^b			–4.36***	1.69*	0.76	–0.15
Nonconscious–Delay	86	84.90	75.60	38.40	50.00	46.50
Share vs. Prev. choice			–1.53	–4.93***	1.53	–0.46
Conscious–No delay	90	70.00	66.70	73.30	75.60	70.00
Share vs. Prev. choice			–0.48	0.97	0.35	–0.84
Conscious–Delay	85	83.50	72.90	74.10	71.80	69.40
Share vs. Prev. choice			–1.67*	0.18	–0.34	–0.34
Control–No delay comparison						
Nonconscious–No delay ^b		2.28**	–1.97**	–0.75	0.30	–0.48
Conscious–No delay		2.71***	2.40**	2.88***	3.51***	2.09**
Control–Delay comparison						
Nonconscious–Delay ^b		5.07***	3.37***	–1.55	0.00	–0.76
Conscious–Delay		4.84***	2.97***	3.28***	2.95***	2.33**
Delay within ...						
Control ^b		–0.15	0.31	–0.31	0.00	–0.33
Nonconscious goal		2.76***	5.50***	–1.09	–0.30	–0.61
Conscious goal		2.11**	0.89	0.12	–0.57	–0.09
Goal state within ...						
No delay ^b		–0.43	–4.35***	–3.63***	–3.24***	–2.58***
Delay		0.25	0.40	–4.71***	–2.92***	–3.03***
Health goal						
Nonconscious–No delay ^a	85	34.10	62.40	52.90	54.10	57.60
Share vs. Prev. choice ^b			3.69***	–1.25	0.16	0.46
Nonconscious–Delay	86	18.60	27.90	66.30	46.50	45.30
Share vs. Prev. choice			1.44	5.04***	–2.62***	–0.16
Conscious–No delay	85	27.10	28.20	32.90	27.10	29.40
Share vs. Prev. choice			0.16	0.67	–0.83	0.33
Conscious–Delay	84	13.10	25.00	29.80	31.00	35.70
Share vs. Prev. choice			1.96**	0.70	0.17	0.65
Control–No delay comparison						
Nonconscious–No delay ^b		–2.11**	1.79*	0.08	0.54	0.38
Conscious–No delay		–3.08***	–2.77***	–2.57**	–3.08***	–3.35***
Control–Delay comparison						
Nonconscious–Delay ^b		–4.25***	–3.15***	2.19**	–0.46	–0.92
Conscious–Delay		–5.10***	–3.54***	–2.72**	–2.55**	–2.19**
Delay within ...						
Nonconscious goal ^b		–2.30**	–4.53***	1.79*	–0.99	–1.61
Conscious goal		–2.27**	–0.47	–0.43	0.56	0.87
Goal state within ...						
No delay ^b		0.99	4.48***	2.63***	3.58***	3.71***
Delay		0.98	0.43	4.76***	2.07**	1.27

NOTE.— * $p < .10$, ** $p < .05$, *** $p < .01$.

^aSample size and choice share means.

^bz-test statistics and significance.

average number of consecutive times each participant made a goal-consistent choice as a function of condition. The first choice had to be goal-consistent, and the count stopped once a goal-inconsistent choice occurred. For example, if a participant's first two choices were goal-consistent, the participant scored a two. If the first choice was goal-inconsistent but the next four choices were goal-consistent, the participant scored a zero. Thus, the range of

the variable was zero to five. We calculated a pseudo-R² by comparing the goodness-of-fit chi square from a model containing the treatment effect to the goodness-of-fit chi square from a null model (McFadden 1974).

For the nonconscious goal, the number of consecutive goal-consistent choices in the delay condition was higher than in the no delay condition for the hedonic goal ($M_{\text{delay}} = 2.15$, $SE = .16$, $M_{\text{no delay}} = 1.25$, $SE = .11$;

$\chi^2(1) = 20.71, p < .01$, Pseudo- $R^2 = .082$) and the health goal ($M_{\text{delay}} = 2.04$, $SE = .15$, $M_{\text{no delay}} = 1.28$, $SE = .12$; $\chi^2(1) = 15.02, p < .01$, Pseudo- $R^2 = .056$). Further, the number of consecutive goal-consistent choices was higher in the delay condition than in the control condition for the hedonic goal ($M_{\text{delay hedonic}} = 2.15$, $SE = .16$, $M_{\text{delay control}} = 1.13$, $SE = .11$; $\chi^2(1) = 27.55, p < .01$, Pseudo- $R^2 = .089$) and the health goal ($M_{\text{delay health}} = 2.04$, $SE = .15$, $M_{\text{delay control}} = 1.26$, $SE = .11$; $\chi^2(1) = 16.06, p < .01$, Pseudo- $R^2 = .048$).

For the conscious goal, the number of consecutive goal-consistent choices did not differ between delay conditions for the hedonic goal ($M_{\text{delay}} = 2.72$, $SE = .18$, $M_{\text{no delay}} = 2.38$, $SE = .16$; $\chi^2(1) = 1.98$, NS) and the health goal ($M_{\text{delay}} = 2.71$, $SE = .18$, $M_{\text{no delay}} = 2.46$, $SE = .17$; $\chi^2(1) = 1.07$, NS) conditions. Further, the number of consecutive goal-consistent choices was higher in the delay condition than in the control condition for the hedonic goal ($M_{\text{delay hedonic}} = 2.72$, $SE = .18$, $M_{\text{delay control}} = 1.13$, $SE = .11$; $\chi^2(1) = 56.32, p < .01$, Pseudo- $R^2 = .155$) and health goal ($M_{\text{delay health}} = 2.71$, $SE = .18$, $M_{\text{delay control}} = 1.26$, $SE = .11$; $\chi^2(1) = 45.18, p < .01$, Pseudo- $R^2 = .123$).

Discussion

The results of study 1 support the idea that increasing nonconscious goal activation before people have an opportunity to make choices can sustain goal-consistent choice. Both at the aggregate and the individual level, a delay (vs. not) between the nonconscious activation of a goal and an opportunity to make food choices increased the number of consecutive, goal-consistent choices. This pattern of results was observed when a hedonic goal or a health goal was active. The influence of increased nonconscious goal activation was temporary, as the results also show an opposing goal rebound effect on the third choice. In contrast, the delay did not help sustain goal-consistent choices in the conscious goal conditions.

It should be noted that the conscious goal activation procedure, wherein people indicated which goal they would follow when making choices, may have also manipulated goal commitment. To help address alternative explanations associated with a specific manipulation, we use different goal manipulations across different studies. Compared to study 1, studies 3, 4, and 5 use a different goal manipulation.

STUDY 2

In study 1, we increased the number of goal-consistent choices by increasing goal activation prior to the first choice. In study 2, we activated a hedonic goal, and increased goal activation in each choice episode by increasing the number of means that were consistent with a hedonic goal from five to 10, keeping the number of

healthy options at five. As discussed in our conceptualization, we expected that increasing the number of hedonic options would encourage participants to continue to choose tasty food items, even after an initial tasty food choice. We did not expect the size of the choice set to influence choice when the goal was conscious because, as discussed earlier, the activation of a conscious goal that is retained in working memory should be relatively insensitive to the ratio of goal-consistent means in the choice set.

Method

Participants and Design. Participants were 772 undergraduate students (50% female, $M_{\text{Age}} = 20.15$) who participated in exchange for course credit. This was the final sample after we excluded 46 participants, using the criteria discussed in study 1. The study had a 3 (goal state: control, nonconscious, conscious) \times 2 (choice set: small vs. large) between-subjects design. The inclusion of a control condition for each choice set allowed us to compare the effects of conscious and nonconscious goal pursuit relative to the proportion of goal-consistent choices that would otherwise be expected to occur by chance at baseline (i.e., 50% in the control–small choice set condition and 67% in the control–large choice set condition).

Procedure. The procedure was similar to study 1, with three important modifications. First, the delay manipulation was not included in study 2. Second, study 2 only examined the conscious versus nonconscious activation of a hedonic goal (i.e., a health goal was not included). Third, during the sequential choice portion of the study, the total number of snacks offered to participants varied based on condition. In the small choice set condition, the choice set was identical to that used in study 1: participants made five sequential choices from a set of 10 total options, of which five were tasty and five were healthy. In the large choice set condition, participants made five sequential choices from a set of 15 total options, of which 10 were tasty and five were healthy. The pool of tasty snacks (Snickers, Reese's Cup, Almond Joy, Milky Way, 3 Musketeers, Twizzlers, Sour Punch Straws, Skittles, Airheads, and Starburst Fruit Chews) and healthy snacks (Special K Protein Bar, Special K Strawberry Bar, Kellogg's Nutri Grain Bar, Veggie Straws, and Kind Cashew Granola Bar) was identical to study 1. As in study 1, the five tasty snacks used in the small choice set condition were a random draw from the 10 tasty snacks (see web appendix B for experimental manipulations and measures).

After making their choices, participants completed the same item about what their goal was while making their choices (1 = Only pick healthy items, 9 = Only pick tasty items) as in study 1. Participants then completed the same debriefing and snack-award procedure as in study 1, before being given their food and thanked for their time.

Results

Manipulation Check. An ANOVA on participants' understanding of the goal revealed a significant effect of goal state ($F(1, 766) = 17.19, p < .01, \hat{\omega}_p^2 = .021$). Participants in the conscious goal condition were more likely to indicate having a hedonic goal while making choices ($M = 7.43, SD = 2.11$) than participants in the nonconscious goal ($M = 6.39, SD = 2.38; F(1, 766) = 27.84, p < .01, \hat{\omega}_p^2 = .034$) and the control condition ($M = 6.47, SD = 2.28; F(1, 766) = 25.41, p < .01, \hat{\omega}_p^2 = .031$). Participants in the nonconscious goal condition and control condition did not differ in their reported goal ($F < 1$). The effect of the choice set factor was not significant ($F(1, 766) = 1.34, NS$), nor was the goal by choice set factor interaction ($F < 1$).

First Choice. The first choices were analyzed to ensure that the goals influenced choice and that the change in choice set composition increased choice share in the nonconscious goal condition—an indicator that the choice set composition increased goal activation (see table 2). These analyses used separate control conditions in the small choice set condition and the large choice set condition to account for the fact that the expected number of goal-consistent options that would occur by chance would vary based on the choice set. First, compared to the control–small set condition (52.5%), the choice share of the hedonic options was higher in the nonconscious–small set (71.0%; $z = 2.99, p < .01$, Cohen's $h = .386$) and conscious–small choice set (78.4%; $z = 4.35, p < .01$, Cohen's $h = .554$) conditions. In addition, compared to the control–large set condition (65.9%), the choice share of the hedonic options was higher in the nonconscious–large set (84.3%; $z = 3.51, p < .01$, Cohen's $h = .432$) and conscious–large set (85.0%; $z = 3.56, p < .01$, Cohen's $h = .452$) conditions.

Second Choice. The second choices were analyzed to assess if the choice set composition helped sustain goal-consistent choice, especially in the nonconscious–large choice set condition (hypothesis 2). First, compared to the control–small set condition (50.0%), the choice share of the hedonic options was lower in the nonconscious–small set condition (36.3%; $z = -2.17, p < .05$, Cohen's $h = -.278$), but higher in the conscious–small set condition (81.3%; $z = 5.27, p < .01$, Cohen's $h = .676$). By contrast, compared to the control–large set condition (66.7%), the choice share of the hedonic options was higher in the nonconscious–large set (83.6%; $z = 3.22, p < .01$, Cohen's $h = .396$) and conscious–large set (82.5%; $z = 2.91, p < .01$, Cohen's $h = .367$) conditions. Second, in the nonconscious–small set condition, participants were more likely to make a goal-consistent choice in the first (71.0%) than in the second (36.3%; $z = -5.49, p < .01$, Cohen's $h = -.711$) choice, whereas in the

nonconscious–large set condition participants were as likely to make a goal-consistent choice in the first (84.3%) and second choice (83.6%; $z = -.15, NS$). These data support hypothesis 2.

Remaining Choices. The remaining choice shares did not change appreciably across choice occasions. In the nonconscious–small set condition, choice shares did not differ from the control–small set condition (choice 3 = 54.8%; $z = .63, NS$; choice 4 = 54.8%; $z = .11, NS$; choice 5 = 53.2%; $z = 1.02, NS$). In the conscious–small set condition, choice shares did differ from the control–small set condition (choice 3 = 75.4%; $z = 4.07, p < .01$, Cohen's $h = .517$; choice 4 = 73.1%; $z = 3.16, p < .01$, Cohen's $h = .398$; choice 5 = 64.9%; $z = 2.93, p < .01$, Cohen's $h = .369$). In the nonconscious–large set condition, choice shares did differ from the control–large set condition (choice 3 = 79.9%; $z = 2.59, p < .01$, Cohen's $h = .317$, choice 4 = 81.3%; $z = 1.87, p < .10$, Cohen's $h = .227$; choice 5 = 79.1%; $z = 2.44, p < .05$, Cohen's $h = .298$). In the conscious goal conditions, choice shares remained goal-consistent, as was expected.

Ancillary Analysis. A Poisson regression analysis revealed an interaction between the goal state and choice set factors ($\chi^2(2) = 53.96, p < .01$). In the nonconscious goal condition, participants made a greater number of consecutive goal-consistent choices in the large set condition ($M = 3.29, SE = .15$) compared to the small set condition ($M = 1.34, SE = .10; \chi^2(1) = 97.25, p < .01$, Pseudo- $R^2 = .202$). This result supports hypothesis 2. By contrast, in the conscious goal condition, participants made a similar number of consecutive goal-consistent choices in the large set ($M = 3.34, SE = .17$) and small set ($M = 3.13, SE = .15; \chi^2(1) = .84, NS$) conditions.

Discussion

Increasing the number of goal-consistent means in a choice set had a positive effect on goal-consistent choices when the goal was nonconscious. While the influence of means availability on nonconscious goal activation is congruent with the notion of bottom-up priming by means (Shah and Kruglanski 2003), this study is the first to demonstrate that increasing the number of goal-consistent means can influence a person's ability to sustain nonconscious goal pursuit. Notably, increasing the number of goal-consistent means available in each choice episode sustained goal pursuit longer than increasing goal activation before the first choice (see study 1). In study 3, we use a different goal and explore an alternative approach to encouraging the sustained pursuit of a nonconscious goal.

TABLE 2
STUDY 2 SEQUENTIAL CHOICE RESULTS

	Sample (<i>n</i>)	Choice 1	Choice 2	Choice 3	Choice 4	Choice 5
Control–Small choice set ^a	122	52.50	50.00	50.80	54.10	46.70
Share vs. Prev. choice ^b			–0.39	0.13	0.52	–1.16
Control–Large choice set	138	65.90	66.70	65.90	71.70	65.90
Share vs. Prev. choice			0.14	–0.14	1.04	–1.04
Nonconscious–Small choice set	124	71.00	36.30	54.80	54.80	53.20
Share vs. Prev. choice			–5.49***	2.92***	0.00	–0.25
Nonconscious–Large choice set	134	84.30	83.60	79.90	81.30	79.10
Share vs. Prev. choice			–0.15	–0.78	0.29	–0.45
Conscious–Small choice set	134	78.40	81.30	75.40	73.10	64.90
Share vs. Prev. choice			0.59	–1.17	–0.43	–1.45
Conscious–Large choice set	120	85.00	82.50	80.00	77.50	76.70
Share vs. Prev. choice			–0.52	–0.50	0.47	–0.15
Control–Small choice set comparison						
Nonconscious–Small choice set ^b		2.99***	–2.17**	0.63	0.11	1.02
Conscious–Small choice set		4.35***	5.27***	4.07***	3.16***	2.93***
Control–Large choice set comparison						
Nonconscious–Large choice set ^b		3.51***	3.22***	2.59***	1.87*	2.44**
Conscious–Large choice set		3.56***	2.91***	2.54**	1.07	1.91*
Choice set within ...						
Control ^b		2.19**	2.73***	2.46**	2.93***	3.11***
Nonconscious goal		2.56**	7.75***	4.30***	4.56***	4.39***
Conscious goal		1.36	0.25	0.88	0.81	2.06**
Goal state within ...						
Small choice set ^b		1.37	7.34***	3.47***	3.06***	1.90*
Large choice set		0.15	–0.20	0.02	–0.75	–0.46

NOTE.— **p* < .10, ***p* < .05, ****p* < .01.

^aSample size and choice share means.

^bz-test statistics and significance.

STUDY 3

In study 3, we investigated another approach for encouraging sustained pursuit of a nonconscious goal: altering how the choice task is framed. We studied the influence of the choice frame on the sustained pursuit of an academic goal. Our hypothesis was that framing a series of choices to either be independent choice events or part of the same choice event would influence the perception of how many goal-consistent behaviors had been performed (hypothesis 3). We framed the choices to either be seen as (1) four separate behaviors (i.e., four independent choices in which participants selected a single option each time), (2) two separate behaviors (i.e., two independent choices in which participants selected a pair of options each time), or (3) one behavior (i.e., four interdependent choices in which participants selected a set of four options).

In the nonconscious goal condition, we predicted that when the four choices were framed as four separate behaviors, a goal rebound effect would happen in the second choice, as was shown in the first two studies. Conversely, when participants interpreted the four choices as two separate behaviors, the first two choices would be viewed as one ongoing goal-consistent behavior, thereby delaying a goal rebound from occurring until the latter two choices

were made. Finally, when participants saw the four choices as one behavior, all four choices would be viewed as one ongoing goal-consistent behavior, thereby leading the majority of choices to be consistent with the nonconscious goal. We did not expect the framing of the behavior to influence choices in the conscious goal condition.

Method

Participants and Design. Participants were 592 undergraduate students (38% female, $M_{\text{Age}} = 20.39$) who participated in exchange for course credit. This was the final sample after we excluded 37 participants, using the criteria discussed in study 1. The study had a 2 (goal state: nonconscious vs. conscious) \times 3 (choice frame: four independent behaviors, two independent behaviors, one behavior) between-subjects design.

Procedure. Each participant engaged in three tasks: a nonconscious goal instantiation or control task, a conscious goal instantiation or control task, and a choice task. The nonconscious goal priming or control task was administered to all participants under the guise of a separate study, in which participants were told that their attentional capabilities would be examined using a lexical decision task

(Bargh and Chartrand 2014). Participants were instructed to look at the center of their computer monitor and focus their attention on a fixation point (X). After two seconds had passed, a letter string replaced the fixation point. Using a keyboard, participants indicated whether the letter string was a word (by pressing "9") or a nonword (by pressing "1"). After completing five practice trials, participants saw a random series of 10 target words, 10 filler words, and 20 nonword trials. In the nonconscious goal condition, the target words (e.g., "academics," "school," "grades") activated an academic goal. In the conscious goal condition, the target words were neutral (e.g., "comment," "off," "considers"), so as not to activate a goal (see web appendix C for experimental manipulations and measures).

Next, participants were notified that they would enter a lottery to receive a \$25 university bookstore gift card as a sign of appreciation for their participation. Participants then read that they would be making a series of decisions on what they would use the gift card to purchase. However, before making their selections, participants were asked to adhere to two stipulations in order to participate in this portion of the session. The first stipulation asked participants to do their best to remain attentive while in the lab. As part of this cover story, participants were asked to memorize a two-digit number (43). The second stipulation asked participants to use the gift card at the bookstore on something they selected in this study. These two stipulations made up the control task that was administered to the nonconscious goal condition. However, for participants in the conscious goal condition, the second stipulation had an added instruction that instantiated the academic goal. In addition to being told to use the gift card on something they selected, participants were instructed, "While you make your selections, please select products that are related to academics (i.e., something you would use for school)." This manipulation was adapted from prior research that has used experimental instructions to activate a conscious goal (Chartrand and Bargh 1996; Chartrand et al. 2008a) and is consistent with a variety of investigations in which goals are made explicit (Dalton and Spiller 2012; Park and Smith 1989; Poynor and Haws 2009; Soman and Cheema 2004).

We took three steps to ensure that participants knew that their choices were consequential. First, to reinforce that participants were making real choices, they were asked to retype the two stipulations discussed above. Second, to prevent the possibility of participants inferring that the gift card award was disingenuous, a pile of the university bookstore gift cards were left in plain view of the participants. Third, all of the options in the choice set were real products that could be purchased from the bookstore.

Participants then moved on to the choice task, where they viewed a total of eight options. Four of the eight options were products that were consistent with the goal of academic success (leather-bound notepad, laptop sleeve,

USB flash drive, and wireless mouse). By contrast, four of the eight options were superfluous, fun products that were inconsistent with the goal of academic success (soccer team scarf, university DuraWave flag, stainless steel tumbler, and set of coasters). All participants selected four products, without replacement, before ending the choice task. However, the manner in which participants were instructed to make choices varied depending on the choice frame condition. In the four independent behaviors condition, participants were asked to select a single product from the list of eight options. Once they made their selection, they pressed the continue button, saw a screen with the remaining seven options, and made another choice. Participants then repeated this process another two times. In the two independent behaviors condition, participants were asked to select a pair of products from the list of eight options by dragging two items into a selection box. After making their first two choices, they pressed the continue button, saw a screen with the remaining six options, and chose two more options. In the one behavior condition, participants were shown the list of eight options and then asked to select four products by dragging them into a selection box.

After making their choices, participants responded to a manipulation check for our goal manipulation: "What was your goal while making the previous choices? (1 = Only pick superfluous items (i.e., something you might want but not actually need), 9 = Only pick academic items (i.e., something you could use for school)."

Finally, participants answered demographic questions, were debriefed for suspicion, and were thanked for their time. One participant from each session was randomly selected to receive a \$25 gift card as they exited the lab.

Results

Pretesting. A pretest ($n = 54$) showed that although the academic and superfluous products were liked similarly (1 = Not at all desirable, 9 = Very desirable) at baseline ($M_{\text{academic}} = 5.83$, $SD = 1.57$ vs. $M_{\text{superfluous}} = 5.54$, $SD = 1.87$; $t(53) = 1.09$, NS), the academic products were seen as more academic (1 = Very fun, 9 = Very academic) than the superfluous products ($M_{\text{academic}} = 6.28$, $SD = 1.45$ vs. $M_{\text{superfluous}} = 4.45$, $SD = 2.02$; $t(53) = 5.29$, $p < .01$). A second pretest ($n = 78$) confirmed that participants with an academic goal would perceive that the academic and superfluous products competed with each other. Participants were shown the two sets of products and were asked "given the goal of doing well academically, to what extent do these two sets of products compete with each other or complement each other? (1 = Complement each other, 5 = Neither complement nor compete with each other, 9 = Compete with each other)." Compared to the midpoint of the scale (i.e., 5), participants indicated that the

TABLE 3
STUDY 3 SEQUENTIAL CHOICE RESULTS

		Four independent behaviors			
	Sample (<i>n</i>)	Choice 1	Choice 2	Choice 3	Choice 4
Nonconscious ¹	107	66.40	38.30	56.10	45.80
Share vs. 50% ²		3.39***	−2.42***	1.26	−0.87
Share vs. Prev. choice ²			−4.12***	2.50***	−1.44
Conscious	94	69.10	70.20	70.20	62.80
Share vs. 50%		3.70***	3.92***	3.92***	2.48***
Share vs. Prev. choice			0.16	0.00	−1.17
Two independent behaviors					
	Sample (<i>n</i>)	Choices 1–2	Choices 3–4		
Nonconscious	89	64.00	40.40		
Share vs. 50%		2.64***	−1.81*		
Share vs. Prev. choice			−3.15***		
Conscious	106	70.80	63.20		
Share vs. 50%		4.28***	2.72***		
Share vs. Prev. choice			−1.18		
One behavior					
	Sample (<i>n</i>)	Choices 1–4			
Nonconscious	100	68.50			
Share vs. 50%		3.70***			
Share vs. Prev. choice					
Conscious	96	71.30			
Share vs. 50%		4.17***			
Share vs. Prev. choice					
Goal state within . . .					
Four independent behaviors ²		0.41	4.53***	2.07**	2.41***
Two independent behaviors		1.01	3.17***		
One behavior		0.43			

NOTE.— * $p < .10$, ** $p < .05$, *** $p < .01$.

¹Sample size and choice share means.

²z-test statistics and significance.

academic and superfluous products competed with each other ($M = 5.96$, $SD = 2.22$; $t(77) = 3.83$, $p < .01$).

A third pretest ($n = 151$) was conducted in order to verify that the choice frame manipulation led participants to perceive the choice task as the intended number of behaviors. The design was a one factor (choice frame: four independent behaviors, two independent behaviors, one behavior) between-subjects design. The procedure was identical to the procedure of the choice task described above (i.e., there was no goal state manipulation). Once participants made their choices, they pressed the continue button, and then saw a screen where they responded to the following item: “We are trying to understand how many behaviors you engaged in during the previous task. How many times were you just asked to imagine what you would use your \$25 gift card for?” The item used a drop-down menu from which participants could either select “once,” “twice,” “three times,” “four times,” or “five times.” In the four independent behaviors condition, the majority of participants selected “four times” and the proportion was significantly greater than what would be anticipated by chance

(85.7%; $\chi^2(1) = 133.55$, $p < .01$). In the two independent behaviors condition, the majority of participants selected “twice” (88.2%; $\chi^2(1) = 148.90$, $p < .01$). Finally, in the one behavior condition, the majority of participants selected “once” (92.2%; $\chi^2(1) = 166.55$, $p < .01$).

Manipulation Check. Participants in the conscious goal condition ($M = 6.21$, $SD = 2.88$) were more likely to indicate having an academic goal while making choices than those in the nonconscious goal condition ($M = 4.12$, $SD = 2.61$; $F(1, 586) = 85.55$, $p < .01$, $\hat{\omega}_p^2 = .126$).

Choice Shares. Similar to prior studies, there was a goal-consistent first choice (66.4%; $z = 3.39$, $p < .01$, Cohen’s $h = .334$), but a goal-inconsistent second choice (38.3%; $z = -2.42$, $p < .01$, Cohen’s $h = -.236$) in the nonconscious goal–four independent behaviors condition (see table 3). When people made two sequential choices in the nonconscious goal condition (i.e., two independent behaviors condition), the average choice share was above chance (64.0%; $z = 2.64$, $p < .01$, Cohen’s $h = .284$) and it did not differ from the first choice in the four independent

TABLE 4
STUDY 4 SEQUENTIAL CHOICE RESULTS

	Sample (n)	Choice 1	Choice 2	Choice 3	Choice 4
Nonconscious: Low load ^a	98	63.30	40.80	53.10	50.00
Share vs. 50% ^b		2.63***	-1.82*	0.61	0.00
Share vs. Prev. choice ^b			-3.15***	1.73*	-0.43
Nonconscious: High load	111	64.90	61.30	59.50	50.50
Share vs. 50%		3.14***	2.38***	2.00**	0.11
Share vs. Prev. choice			-0.56	-0.27	-1.35
Conscious: Low load	102	67.60	66.70	70.60	62.70
Share vs. 50%		3.56***	3.37***	4.16***	2.57***
Share vs. Prev. choice			-0.14	0.60	-1.20
Conscious: High load	97	72.20	59.80	41.20	45.40
Share vs. 50%		4.37***	1.93*	-1.73*	-0.91
Share vs. Prev. choice			-1.82*	-2.59***	0.59
Load within ...					
Nonconscious goal ^b		0.24	2.96***	0.93	0.07
Conscious goal		0.71	-1.01	-4.18***	-2.45***
Goal state within ...					
Low load ^b		0.64	3.67***	2.55***	1.81*
High load		1.13	-0.22	-2.63***	-0.73

NOTE.— * $p < .10$, ** $p < .05$, *** $p < .01$.

^aSample size and choice share means.

^bz-test statistics and significance.

behaviors condition ($z = -.35$, NS, statistic not reported in table 4). When people made four simultaneous choices in the nonconscious goal condition (i.e., one behavior condition), the average choice share was above chance (68.5%; $z = 3.70$, $p < .01$, Cohen's $h = .379$) and did not differ from the first choice in the four independent behaviors condition ($z = .32$, NS, statistic not reported in table 4). These results are consistent with hypothesis 3. It should be noted that the choice framing manipulation did not influence the choices in the conscious goal pursuit condition, as they remained goal-consistent.

Finally, because in the two independent behaviors and one behavior conditions the choices were grouped (i.e., two, four), we were unable to track the order in which each choice was made, and therefore did not conduct an ancillary, individual-level analysis in this study.

Discussion

The results of study 3 provide additional insight into how to sustain the pursuit of a nonconscious goal across multiple choices. Framing a sequence of choices as part of one behavior discouraged people from releasing the nonconscious goal. Consequently, people selected a greater number of goal-consistent options across choice opportunities. These results suggest that the subjective perception of what constitutes a goal-consistent behavior is pivotal to knowing when a nonconscious goal will be released and an opposing goal might rebound. Thus, the findings lend support to our conceptualization of the pursuit of a nonconscious goal, in that pursuit can be sustained by discouraging the release of the goal.

This study used a direct instruction to activate a conscious goal, thus addressing potential confounds associated with goal commitment, as was the case in studies 1 and 2. While this manipulation has been used in previous research, it does have less external validity because it did not involve a conscious goal that naturally became active in a marketplace context. We will address this limitation in the General Discussion.

STUDY 4

We have proposed that a person can be discouraged from pursuing an opposing goal if the resources needed to adjust the activation of the focal goal downward are limited (hypothesis 4). That is, limiting the availability of cognitive resources should curtail the release of the nonconscious goal and allow goal-consistent behavior to persist. Thus, in study 4 we generated cognitive load for half of the participants with the objective of stopping them from releasing the nonconscious goal (e.g., academic achievement) and activating an opposing goal (e.g., have fun, be social). We predicted that when people were under cognitive load, the nonconscious goal would remain active after an initial choice, sustaining goal pursuit for a larger number of choices. Moreover, when this cognitive load was removed, the nonconscious goal should be released and choice shares should adjust accordingly.

Method

Participants and Design. Participants were 408 undergraduate students (41% female, $M_{Age} = 20.82$) who

participated in exchange for course credit. This was the final sample after we excluded 29 participants, using the criteria discussed in study 1. The study had a 2 (goal state: nonconscious vs. conscious) \times 2 (cognitive load: low vs. high) between-subjects design.

Procedure. The procedure was similar to that of study 3 with regards to the goal manipulations. Participants began by either completing the nonconscious goal priming task (nonconscious goal condition) or the control task (conscious goal condition) as detailed in study 3. Next, participants were notified that they would enter a lottery to receive a \$25 gift card to the university bookstore. Participants then proceeded to read the same set of instructions from study 3, except for one difference: we varied the number that participants were asked to remember as a means of manipulating cognitive load (Gao, Li, and Wyr 2016). Specifically, participants in the low cognitive load condition memorized a two-digit number (43), whereas participants in the high cognitive load condition memorized an eight-digit number (43876901; see web appendix D for experimental manipulations and measures).

Participants then made four sequential product choices, without replacement, from the same choice set as in study 3. After participants made their third choice, we removed the cognitive load by asking participants to report the number they were asked to memorize. We did this in order to determine if the reduction in the cognitive load would allow the nonconscious goal to be released.

After making their choices, participants were asked, "To what extent did memorizing your number make it hard to think carefully while making your choices?" (1 = Not at all, 9 = A lot). This item was used as a cognitive load manipulation check. As a check for the goal manipulation, participants were asked: "What was your goal while making the previous choices? (1 = Only pick superfluous items (i.e., something you might want but not actually need), 9 = Only pick academic items (i.e., something you could use for school).") Finally, participants answered a few demographic questions, were debriefed for suspicion, and were thanked for their time. One randomly selected participant from each session received a \$25 gift card to the bookstore as they exited the lab.

Results

Manipulation Checks. Participants in the high load condition ($M = 4.67$, $SD = 2.71$) found it more difficult to memorize their number than participants in the low load condition ($M = 2.22$, $SD = 2.06$; $F(1, 404) = 103.89$, $p < .01$, $\hat{\omega}_p^2 = .202$). Participants in the conscious goal condition ($M = 6.12$, $SD = 2.43$) were more likely to indicate having an academic goal while making the previous choices compared to the nonconscious condition ($M = 4.35$, $SD = 2.55$; $F(1, 404) = 51.37$, $p < .01$, $\hat{\omega}_p^2 = .110$). There was

no cognitive load by goal interaction on the stated likelihood of having an academic goal ($F < 1$).

First Choice. The first choices were analyzed to ensure that the nonconscious and conscious goal states influenced choice (see table 4). Compared to a random choice share (i.e., 50%), the choice share of academic options was higher in the nonconscious–low load (63.3%; $z = 2.63$, $p < .01$, Cohen's $h = .269$), nonconscious–high load (64.9%; $z = 3.14$, $p < .01$, Cohen's $h = .303$), conscious–low load (67.6%; $z = 3.56$, $p < .01$, Cohen's $h = .360$), and conscious–high load (72.2%; $z = 4.37$, $p < .01$, Cohen's $h = .460$) conditions.

Second Choice. The second choices were analyzed to assess if the cognitive load helped sustain goal-consistent choice, especially in the nonconscious–high load condition (hypothesis 4). First, compared to chance, the choice share of the academic options was marginally lower in the nonconscious–low load (40.8%; $z = -1.82$, $p < .10$, Cohen's $h = -.185$), but higher in the nonconscious–high load (61.3%; $z = 2.38$, $p < .01$, Cohen's $h = .228$), conscious–low load (66.7%; $z = 3.37$, $p < .01$, Cohen's $h = .341$), and conscious–high load (59.8%; $z = 1.93$, $p < .10$, Cohen's $h = .197$) conditions. Second, in the nonconscious–low load condition, participants were more likely to make a goal-consistent choice in the first (63.3%) than in the second (40.8%; $z = -3.15$, $p < .01$, Cohen's $h = -.454$) choice, whereas in the nonconscious–high load condition participants were as likely to make a goal-consistent choice in the first (64.9%) and second choice (61.3%; $z = -.56$, NS). These data support hypothesis 4.

Third Choice. The third choices were analyzed to assess if the cognitive load continued to sustain goal-consistent choices in the nonconscious–high load condition (hypothesis 4). First, the choice share of the academic options in the nonconscious–high load condition remained above chance (59.5%; $z = 2.00$, $p < .05$, Cohen's $h = .191$), whereas the choice share in the nonconscious–low load condition returned to chance (53.1%; $z = .61$, NS). Second, in the nonconscious–high load condition participants were as likely to make a goal-consistent choice in the second (61.3%) as they were in the third choice (59.5%; $z = -.27$, NS). These data support hypothesis 4.

Fourth Choice. The cognitive load manipulation was discontinued after the third choice. Critically, the choice share of the academic options in the nonconscious–high load condition dropped to chance (50.5%; $z = .11$, NS). This result is consistent with the claim that cognitive resources were needed to release the nonconscious goal.

Ancillary Analysis. A Poisson regression analysis revealed an interaction between the goal state and cognitive load factors ($\chi^2(1) = 21.03$, $p < .01$). In the nonconscious goal condition, participants made a greater number

of consecutive goal-consistent choices in the high load condition ($M = 1.63$, $SE = .12$) compared to the low load condition ($M = .99$, $SE = .10$; $\chi^2(1) = 15.74$, $p < .01$, $\text{Pseudo-}R^2 = .048$). This result supports hypothesis 4. By contrast, in the conscious goal condition, participants made a greater number of consecutive goal-consistent choices in the low load condition ($M = 2.04$, $SE = .14$) compared to the high load condition ($M = 1.57$, $SE = .13$; $\chi^2(1) = 5.82$, $p < .05$, $\text{Pseudo-}R^2 = .017$).

Discussion

The results of study 4 demonstrate an additional way to encourage goal-consistent choices during the pursuit of a nonconscious goal. In keeping participants' cognitive resources occupied during goal pursuit, the nonconscious goal was not released. This effect occurred presumably because the cognitive load inhibited the execution of nonconscious processes that assist in goal release. Yet, when these resources were made available, after the third choice, the nonconscious goal was released and had no influence on the fourth choice. These findings support the idea that the sustained pursuit of a nonconscious goal can come from inhibiting goal deactivation.

The results also show that cognitive load hurt the pursuit of the conscious goal. It seems that in the absence of load, as in the prior studies, awareness helped participants maintain the conscious goal in working memory. In this study, the choice share in the conscious goal–high load condition dropped to below chance in the third choice (41.2%), in contrast to the goal-consistent choice that was observed in the conscious goal–low load condition (70.6%). This result is consistent with the idea that, as more time passed, the high cognitive load interfered with rehearsal of the conscious goal in working memory. Importantly, these effects were observed in a context where there were means (i.e., superfluous, fun products) that competed with the focal academic goal. In study 5, we examine the possibility that cognitive load exerts a different influence on conscious goal pursuit in the absence of means that compete with the focal goal.

STUDY 5

Study 5 is similar to study 4 but presents a different set of means. Instead of presenting means that are inconsistent with an active goal, it presents means that are neutral with regards to an active goal and its counterpart. In doing so, study 5 allows us to test a key assumption of our conceptualization of nonconscious goal pursuit. Specifically, we have hypothesized that the nonconscious goal rebound effect is a consequence of postchoice adjustment to focal and competing goal activations, such that a focal goal is released and a competing goal is no longer inhibited. Yet, when there are no options that are consistent with a

competing focal goal, there is no opportunity to pursue a competing goal.

The new choice set should lead to results that replicate and diverge from those observed in study 4. Thus, when there is a low cognitive load, a rebound effect should no longer occur during nonconscious goal pursuit. Instead, the goal should be released and a chance choice share should be observed (diverge from study 4). During conscious goal pursuit, people should be able to keep the goal in working memory, which should result in goal-consistent choices (replicate study 4). When there is a high cognitive load, the resources needed to make postchoice adjustments to goal activation are limited. Thus, people should continue to select goal-consistent options during nonconscious goal pursuit (replicate study 4). During conscious goal pursuit, however, even though the goal can no longer be kept in working memory, the absence of goal-inconsistent options should encourage the pursuit of the focal goal, as now it would not be possible for the competing goal to be pursued (diverge from study 4).

Method

Participants and Design. Participants were 383 undergraduate students (41% female, $M_{\text{Age}} = 20.63$) who participated in exchange for course credit. This was the final sample after we excluded 16 participants, using the criteria discussed in study 1. The study had a 2 (goal state: nonconscious vs. conscious) \times 2 (cognitive load: low vs. high) between-subjects design.

Procedure. The procedure was identical to study 4, with two modifications. First, the cognitive load manipulation was different (Logie, Zucco, and Baddeley 1990). Participants were shown a 5×5 square grid in which certain cells in the grid contained an "X" and were asked to remember which cells contained an "X." However, the number of cells containing an "X" and their location within the 5×5 grid varied by condition. In the low load condition, participants were given five cells that contained an "X," all located on a straight diagonal line from the top left down to the bottom-right portion of the grid. By contrast, in the high load condition, participants were given 10 cells that contained an "X," dispersed asymmetrically throughout the grid (see web appendix E for experimental manipulations and measures). Second, the choice set was altered from study 3, such that the four academic products were retained in the set (i.e., leather-bound notepad, laptop sleeve, USB flash drive, and wireless mouse), but the four superfluous, fun products were replaced with four neutral products that neither complemented nor competed with the focal academic goal (i.e., bed sheets, frying pan, umbrella, six-piece towel set).

As in study 4, participants made four sequential choices, without replacement. After participants made their third

choice, we removed the cognitive load by asking participants to indicate on a blank 5×5 grid which cells contained an "X" from the prior grid they were asked to memorize. We did this in order to determine if the reduction in the cognitive load would allow the nonconscious goal to be released.

After making their choices, participants were asked, "To what extent did memorizing which cells had an "X" in the table make it hard to think carefully while making your choices?" (1 = Not at all, 9 = A lot). This item was used as a cognitive load manipulation check. Participants also answered the same goal manipulation check as in study 4. Finally, participants answered a few demographic questions, were debriefed for suspicion, and were thanked for their time. One randomly selected participant from each session received a \$25 gift card to the bookstore as they exited the lab.

Results

Pretesting. A pretest ($n = 78$) showed that the academic and neutral products were liked similarly (1 = Not at all desirable, 9 = Very desirable) at baseline ($M_{\text{academic}} = 5.46$, $SD = 1.29$ vs. $M_{\text{neutral}} = 5.74$, $SD = 1.52$; $t(77) = -1.23$, NS). In addition, participants were shown the two sets of four academic and four neutral products and asked, "Given the goal of doing well academically, to what extent do these two sets of products compete with each other or complement each other (1 = Complement each other, 5 = Neither complement nor compete with each other, 9 = Compete with each other)." Compared to the midpoint of the scale (i.e., 5), participants indicated that the academic and superfluous products neither competed with nor complemented each other ($M = 4.78$, $SD = 1.70$; $t(77) = -1.13$, NS).

Manipulation Checks. Participants in the high load condition ($M = 4.01$, $SD = 2.67$) found it more difficult to memorize which cells contained an "X" than participants in the low load condition ($M = 2.08$, $SD = 2.09$; $F(1, 379) = 61.68$, $p < .01$, $\hat{\omega}_p^2 = .137$). Participants in the conscious goal condition ($M = 6.80$, $SD = 2.40$) were more likely to indicate having an academic goal while making the previous choices compared to the nonconscious condition ($M = 5.55$, $SD = 2.38$; $F(1, 379) = 25.97$, $p < .01$, $\hat{\omega}_p^2 = .062$). There was no cognitive load by goal interaction on the stated likelihood of having an academic goal ($F < 1$).

First Choice. The first choices were analyzed to ensure that the nonconscious and conscious goal states influenced choice (see table 5). Compared to a random choice share (i.e., 50%), the choice share of academic options was higher in the nonconscious-low load (76.7%; $z = 5.42$, $p < .01$, Cohen's $h = .563$), nonconscious-high load (71.1%; $z = 4.00$, $p < .01$, Cohen's $h = .436$), conscious-low load

(82.2%; $z = 6.11$, $p < .01$, Cohen's $h = .700$), and conscious-high load (74.0%; $z = 4.80$, $p < .01$, Cohen's $h = .501$) conditions.

Second Choice. The second choices were analyzed to assess whether cognitive load helped sustain goal-consistent choice for both a nonconscious and conscious goal when the choice context did not contain competing options. First, in the low load condition, the choice share of the academic options was similar to chance in the nonconscious condition (54.4%; $z = .89$, NS), but greater than chance in the conscious condition (75.6%; $z = 4.86$, $p < .01$, Cohen's $h = .538$). The result in the nonconscious condition suggests that options that compete with the focal goal must be present in order for goal rebound to occur. Second, in the high load condition, the choice share of the academic options was greater than chance in both the nonconscious (68.9%; $z = 3.59$, $p < .01$, Cohen's $h = .388$) and conscious (68.0%; $z = 3.60$, $p < .01$, Cohen's $h = .368$) conditions. The result in the conscious condition suggests that the negative influence of cognitive load is mitigated when the choice context does not include options that compete with the focal goal.

Third Choice. The third choices were analyzed to assess if the cognitive load continued to sustain goal-consistent-choices in the nonconscious and conscious conditions. First, in the low load condition, the choice share of the academic options was similar to chance in the nonconscious condition (55.3%; $z = 1.08$, NS), but greater than chance in the conscious condition (74.4%; $z = 4.63$, $p < .01$, Cohen's $h = .510$). Second, in the high load condition, the choice share of the academic options was greater than chance in both the nonconscious (64.4%; $z = 2.73$, $p < .01$, Cohen's $h = .292$) and conscious (65.0%; $z = 3.00$, $p < .01$, Cohen's $h = .305$) conditions.

Fourth Choice. The cognitive load manipulation was discontinued after the third choice. Critically, the choice share of the academic options in the nonconscious-high load condition dropped to chance (43.3%; $z = -1.27$, NS). This result is consistent with the claim that cognitive resources were needed to release the nonconscious goal. Conversely, the choice share of the academic options in the conscious-high load condition remained above chance (62.0%; $z = 2.40$, $p < .01$, Cohen's $h = .242$). This result suggests that the negative effect of cognitive load on conscious goal pursuit is mitigated in a choice context without competing options.

Ancillary Analysis. A Poisson regression analysis revealed an interaction between the goal state and cognitive load factors ($\chi^2(1) = 6.36$, $p = .01$). In the nonconscious goal condition, participants made a greater number of consecutive goal-consistent choices in the high load ($M = 2.01$, $SE = .15$) compared to the low load condition ($M = 1.58$, $SE = .12$; $\chi^2(1) = 4.87$, $p < .05$,

TABLE 5
STUDY 5 SEQUENTIAL CHOICE RESULTS

	Sample (n)	Choice 1	Choice 2	Choice 3	Choice 4
Nonconscious: Low load ^a	103	76.70	54.40	55.30	47.60
Share vs. 50% ^b		5.42***	0.89	1.08	-0.49
Share vs. Prev. choice ^b			-3.37***	0.13	-1.11
Nonconscious: High load	90	71.10	68.90	64.40	43.30
Share vs. 50%		4.00***	3.59***	2.73***	-1.27
Share vs. Prev. choice			-0.32	-0.64	-2.89***
Conscious: Low load	90	82.20	75.60	74.40	64.40
Share vs. 50%		6.11***	4.86***	4.63***	2.73***
Share vs. Prev. choice			-1.08	-0.19	-1.46*
Conscious: High load	100	74.00	68.00	65.00	62.00
Share vs. 50%		4.80***	3.60***	3.00***	2.40***
Share vs. Prev. choice			-0.94	-0.45	-0.44
Load within ...					
Nonconscious goal ^b		-0.88	2.07**	1.29*	-0.60
Conscious goal		-1.36*	-1.16	-1.40*	-0.34
Goal state within ...					
Low load ^b		-0.94	-3.08***	-2.77***	-2.35***
High load		-0.45	0.13	-0.09	-2.58***

NOTE.— * $p < .10$, ** $p < .05$, *** $p < .01$.

^aSample size and choice share means.

^bz-test statistics and significance.

Pseudo- $R^2 = .017$). This result supports hypothesis 4. By contrast, in the conscious goal condition, participants made a similar number of consecutive goal-consistent choices in the low load ($M = 2.47$, $SE = .17$) compared to the high load condition ($M = 2.18$, $SE = .14$; $\chi^2(1) = 1.67$, NS).

Discussion

Study 5 demonstrates that the absence of means inconsistent with a focal goal can modify conscious and nonconscious goal pursuit in different ways. During nonconscious goal pursuit, goal rebound no longer occurred under low and high cognitive load because there were no means available for pursuing the competing goal. During conscious goal pursuit, the high cognitive load no longer interfered with goal pursuit because the choice set did not include means consistent with a competing goal, so vigilance was not required to sustain pursuit of the conscious goal. The findings highlight another way in which conscious and nonconscious goal pursuit differ, and indicate that the availability of goal-inconsistent means is important in determining the deactivation of a focal goal and activation of a competing goal.

GENERAL DISCUSSION

This research investigated how conscious and nonconscious goals are pursued over a sequence of choices. We found that the pursuit of a nonconscious goal is more often than not characterized by a goal rebound effect, which is the choice of a goal-inconsistent option subsequent to the

choice of a goal-consistent option. Yet there are ways to sustain the pursuit of a nonconscious goal. Introducing a delay between the activation of a nonconscious goal and an initial choice encourages the pursuit of the nonconscious goal, as consumers tend to make a second choice that is also consistent with the goal (study 1). Increasing the number of goal-consistent options also encourages the pursuit of a nonconscious goal, as consumers make goal-consistent choices for as many as five choice episodes (study 2). When people process the choice sequence as one episode, the pursuit of a nonconscious goal is sustained (study 3). Inhibiting the ability to release a nonconscious goal, owing to cognitive load, also leads to sustained goal pursuit (studies 4 and 5). Finally, the goal rebound effect occurs only when a choice set includes means that oppose the focal goal (study 5). Overall, the findings demonstrate that the pursuit of a nonconscious goal is influenced by different factors than the pursuit of a conscious goal, but that both can sustain goal pursuit in an appropriate context.

The findings have implications for our knowledge of how the pursuit of a nonconscious goal occurs (Laran 2016). First, consider the goal rebound effect that was mitigated in the conditions investigating the pursuit of a nonconscious goal. By demonstrating that these findings are moderated by how strongly the goal is initially activated, we provide evidence that the rebound effect may occur because nonconscious goals represent a temporary influence on preferences (Bettman, Luce, and Payne 1998). Thus, a nonconscious goal should not influence chronic attitudes, but rather the part of one's attitudes that becomes temporarily more accessible. Once the influence of a

nonconscious goal occurs, in the form of a goal-consistent choice, the goal system responds by generating an alternative behavior, which ensures that one side of a consumer's set of preferences does not dominate behavior. This idea contrasts with the claim that a goal rebound effect occurs because people simply have a preference for balancing across important goals (Dhar and Simonson 1999). We contend that the perspective favoring the idea that people "reason about the importance of balancing multiple goals" is not as relevant to the pursuit of nonconscious goals. If this perspective were relevant to the pursuit of nonconscious goals, and the rebound effect occurred because people reason that multiple goals are important, then the increased goal activation condition in study 1 (nonconscious goal-delay) should have encouraged a stronger goal rebound effect, not the sustained pursuit of the goal.

A second insight involves the demonstration that cognitive resources impact the pursuit of a nonconscious goal. The findings show that some processes involved in the pursuit of a nonconscious goal rely on resources, just like conscious goal pursuit, but that these resources do not make people aware that a goal is active. This commonality is important because it is one piece of evidence that conscious and nonconscious goal pursuit respond differently to certain contextual factors, but are not necessarily a part of two different systems. This claim is consistent with the view that awareness of the goal varies along a continuum consisting of the many activities associated with goal pursuit (Plassmann and Mormann 2017; Sweldens, Tuk, and Hütter 2017), and that awareness is another characteristic of a goal that may differ across situations, but not the focal or determining difference (Williams and Poehlman 2017). Moving forward, it is important to investigate how other differences between goals interact with goal activation awareness to influence behavior.

The practical implications of these findings may be diminished by the question "if nonconscious goals cannot influence behavior as much as conscious goals, why would marketers even try to influence consumers via nonconscious goals?" Considering that we know marketers can activate nonconscious goals (e.g., salespeople can suggest goals in a subtle way, objects in a store may activate goals, incidental marketplace cues may activate goals), the answer to this question may take different forms. First, marketers may use the goal rebound effect. Consumers often make a sequence of choices when shopping, and knowing that a second choice will be inconsistent with a first choice provides useful information for marketers about how consumers will choose after an initial goal-consistent choice. For instance, stores that sell mostly utilitarian products (e.g., health shops, bookstores) could strategically place more fun, hedonic products at the checkout aisle. Second, establishing a delay between nonconscious goal activation and an initial choice is easy to implement. A salesperson in a store, for example, could make sure there is a delay

between exposure to goal-activating information (e.g., a nice object that suggests buying a high-end model of a product) and exposure to the options involved in a product choice. Third, if marketers want to encourage consumers to follow the same goal over a sequence of choices, framing several choices as one behavior (e.g., product bundles) could help sustain the pursuit of a nonconscious goal. Given the lack of awareness from consumers of which goals are active, and how their behavior varies over several choices, using the findings presented here could generate an array of opportunities for marketers to have more control over consumers' purchases.

These findings also have implications for people pursuing self-improvement goals. The existing recommendations in this area of research focus on the idea that people should keep self-improvement goals in working memory (e.g., sustained goal pursuit is a conscious act). This is difficult (Dalton and Spiller 2012), and the factors we explore show how nonconscious goals can be sustained. For example, a person might stockpile more goal-consistent than goal-inconsistent snacks, rather than avoid purchasing snacks (a practice that encourages rebound effects when the opportunity presents itself). Moreover, reframing eating to represent multiple consumption episodes as a single episode could be beneficial. For example, framing a day's worth of food choices as one occasion ("today's meals") may help sustain goal activation. Moving forward, we need additional knowledge on how long the effect of grouping behaviors may last, and whether there is a limit to the number of behaviors that can be framed as "one behavior."

The findings and experimental paradigm used here also have implications for how we study goal pursuit. The great majority of investigations in this area have used a single behavioral episode to examine how goals influence behavior (Laran et al. 2008; Wilcox et al. 2009). When these investigations were expanded, they tended to involve two choice episodes (Chartrand et al. 2008b; Sela and Shiv 2009). The larger array of choices used in the current research showed that sometimes choices go back to their baseline level after the second choice, and sometimes they do not. These findings reinforce the idea that it is important to look at a longer sequence of choice episodes. This recommendation is consistent with a consumer's day-to-day life, wherein people repeatedly make decisions after being exposed to environmental stimuli. In fact, people make many decisions over the course of a day, and some of these decisions are made after exposure to stimuli that have a significant influence on which nonconscious goals become active. Given this reality, looking at a single choice episode may be considered quite limiting in its ability to represent actual consumer behavior.

In a similar vein, a recent commentary on enhancing realism in consumer research by Morales, Amir, and Lee (2017) discusses when research benefits from the inclusion of realistic experimental designs and/or the measurement

of actual consumer behavior. In each of our studies, the dependent measure consisted of a series of consequential choices, and therefore we were able to provide evidence of a goal rebound effect that would probably not have occurred with the use of hypothetical choices (Chartrand et al. 2008b). Thus, by including a consequential measure of goal pursuit, our research was able to enhance our understanding of when consumers are likely to make goal-consistent versus goal-inconsistent choices. This is noteworthy, as it suggests more broadly that a focus on behavioral consequentiality might benefit goals research by providing a more realistic view of how consumers pursue their goals.

The experimental paradigm used in this research involved examining a series of consequential, sequential choices in order to provide new insights into nonconscious goal pursuit. However, it is also important to acknowledge that conducting research in this area often involves careful pretesting and piloting in order to develop a proper procedure. For those who are interested, we have provided a set of recommendations for navigating such methodological considerations (see web appendix G). We use examples from the pretesting and piloting that was conducted during our own research program. We hope that our guidelines encourage other researchers to examine contexts that provide further insight into nonconscious goal pursuit.

Despite its merits, this research has limitations. The biggest limitation is the failure to adequately investigate the competing sources of goal-inconsistent choices during nonconscious and conscious goal pursuit. To appreciate this issue, it is important to remember that nonconscious goal pursuit relies on the inhibition of competing goals (Laran and Janiszewski 2009), whereas conscious goal pursuit relies on rehearsal to increase the activation of the focal goal. When a focal nonconscious goal is successfully pursued, the focal goal becomes less active, the inhibited goal becomes more active, and a goal rebound effect occurs. When a focal conscious goal is successfully pursued, a person can consciously assess progress and determine whether it is worthwhile to balance goal pursuit (Dhar and Simonson 1999), license (Khan and Dhar 2006), or disengage (Fishbach and Dhar 2005). Thus, nonconscious rebound effects cannot be consciously controlled, and conscious decisions to pursue alternative goals cannot be nonconsciously controlled. Yet, when people are monitoring their choices, there are factors that can create an opportunity to consciously observe how each choice leads to goal progress, and create a more balanced set of behaviors. While our objective in using the manipulations we used was to control for the influence of these factors, future research could allow for the influence of these factors, and compare how both nonconscious and conscious goal pursuit can lead to subsequent pursuit of alternative goals.

Finally, this work challenges the assumption that the most common form of goal pursuit is conscious. Many

academics assume that all goals are initially conscious and that nonconscious goal pursuit is a special case of conscious goal pursuit (i.e., automatic goal pursuit). We find that nonconscious goals are not a special case of conscious goal pursuit, but rather an independent influence on human behavior. This perspective of nonconscious goal pursuit creates an opportunity to uncover novel antecedents and consequences of goal-directed behavior, insights that could not be anticipated using the “conscious first” perspective. Thus, we hope our findings will help broaden the scope of future investigations.

DATA COLLECTION INFORMATION

All three authors supervised the collection of data by research assistants using participants from the University of Cincinnati (studies 1–5) and the University of Florida (study 1) between the spring of 2016 and the spring of 2018. The third author was primarily responsible for the data analysis with supervision and input from the first and second authors. Data were discussed throughout the entire research agenda by all authors.

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