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When pursuing goals that involve subgoals of varying levels of difficulty, consumers prefer to follow a difficult-to-easy sequence when completing the subgoals because they believe that such a sequence renders the overall goal easier to achieve. However, consumers are actually more successful when they follow an easy-to-difficult sequence when completing subgoals. In seven studies, the authors present consistent evidence for this mismatch and explore the value of subgoals as an important boundary condition.

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## Climbing the Wrong Ladder: The Mismatch Between Consumers' Preference for Subgoal Sequences and Actual Goal Performance

People commonly use subgoals in their daily lives. For example, salespeople often break their overall annual sales goals into more manageable pieces, such as quarterly or monthly targets. Similarly, a customer who aims to earn 10,000 points in a frequent-shopper program to qualify for a premium member discount can divide this ultimate goal into smaller subgoals of earning 2,500 points each quarter, though the 2,500 points (i.e., accomplishing subgoals) may not have any benefits by themselves.

The extant literature has documented the positive impact of subgoals on performance (Gollwitzer 1999; Locke and Latham 1990; Shah and Kruglanski 2003; Vallacher and Wegner 1987). For example, Heath, Larrick, and Wu (1999)

find that dividing a large task into smaller, more manageable subtasks promotes goal initiation and persistence. Recent research regarding consumer debt management (e.g., Gal and McShane 2012) has shown that success in paying off debt accounts is predictive of eliminating overall debts, providing evidence that attaining subgoals promotes success in achieving superordinate goals.

Although much attention has been paid to the difference between the presence and absence of subgoals in goal pursuit, relatively little research has systematically examined how subgoals should be structured to maximize their beneficial impact. For example, consider a consumer who needs to collect 15 stamps on his or her loyalty card for a reward. Given that collecting 15 stamps seems like an excessively difficult task, this person might decide to separate the challenge into two phases (i.e., subgoals), which could be set up following either a “10-5” (i.e., difficult-to-easy) or a “5-10” (i.e., easy-to-difficult) structure. Which structure—difficult-to-easy or easy-to-difficult—would better facilitate the collection of the 15 stamps? More generally stated, when encountering subgoals of different levels of difficulty, in what sequence should they be arranged to maximize the chances of achieving the overall goal? In addition—and importantly—how capable are people of prioritizing subgoals to aid in accomplishing their important life goals?

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This research aims to shed some initial light on these important questions. We hypothesize that when facing subgoals of varying levels of difficulty, consumers prefer to begin their pursuit with the more difficult subgoals, believing that their energy levels will decrease as they expend more effort and that the optimal strategy for attaining the overall goal is to tackle the more difficult task earlier. However, contrary to their expectations, they are likely to perform better if they start with the easier subgoal because the completion of easy subgoals allows them to experience greater commitment to the goal, thereby increasing their effort to accomplish the overall goal.

Consider, for example, a person who needs to trek to a location that is approximately seven miles away. This person could complete the trek in two phases: (s)he could start with a five-mile trek and then take a break before attempting the remaining two miles, or (s)he could do it in the reverse order by taking a break after two miles and then completing the remaining five miles. People often prefer the first sequence—that is, starting with a more difficult subgoal and moving toward an easier one; yet they are actually more likely to finish the journey if they start with the two-mile subgoal because reaching an early milestone increases goal commitment and ensures that they are motivated during the early stages. The unfortunate fact, however, is that people are often unable to foresee this change in goal commitment, and therefore, they often opt for the reverse order when establishing the sequence of subgoals.

#### *SUBGOALS AS COMMITMENT*

The extant literature has explored how subgoals may facilitate successful goal pursuit (Carver and Scheier 1998; Emmons 1992; Locke and Latham 1990; Vallacher and Wegner 1987). For example, the cybernetic model (Carver and Scheier 1998) suggests that when facing challenges in completing a higher-order goal, people shift their attention to the subcomponents of that goal. When progress on the subgoal is satisfactory, people then refocus their attention on the overall goal. This shift between the higher-order goal and its components facilitates successful goal attainment.

Although numerous studies have emphasized the value of subgoals in helping attain important goals, more recent research has begun to examine subgoals as mechanisms of goal commitment. For example, Fishbach, Dhar, and Zhang (2006) demonstrate that when people view their subgoals as commitments to an overriding goal, pursuit of the subgoals increases their tendency to pursue associated subgoals. Similarly, failure to pursue a subgoal can result in lower self-efficacy, which in turn has been shown to lead to lower goal commitment and, consequently, demotivation (Soman and Cheema 2004).

If the accomplishment of subgoals signals goal commitment and elicits greater motivation, one implication is that the accomplishment of an early subgoal should increase commitment to the overriding goal and therefore motivate the exertion of greater effort to ensure the accomplishment of the overall goal. For example, if the person pursuing the seven-mile trek reaches an important milestone after two miles, (s)he may feel more committed to the entire goal and may be more likely to continue pursuing the goal compared with another person who completed the same two miles

without accomplishing a meaningful subgoal. Following this reasoning, we expect people to perform better if they begin with a relatively easy subgoal that would provide them an early commitment to the overall goal and, therefore, greater motivation to accomplish the entire task.

#### *FAILURES IN PREDICTING COMMITMENT CHANGE*

Problems arise, however, when people evaluate their likelihood of accomplishing a goal. When confronted with a decision about whether to pursue a particular goal, people gauge the likelihood that they can attain the goal and are likely to commit only to goals that they consider attainable (Bandura 1997; Shah and Higgins 1997; Vroom 1964). These assessments often focus on the properties of the goal, and in these moments, people fail to correctly anticipate the extent to which they may feel committed to the goal after they have initiated its pursuit and experienced some early success, particularly when the initial steps are objectively valueless. For example, when assessing whether they can finish a marathon, people consider both the distance and their own physical stamina; however, they often fail to anticipate their motivation to persevere and finish the race after they have experienced commitment to the goal.

Ample evidence supports people's inability to anticipate how their own feelings may change in the future. The robust endowment effect (for a review, see Hoffman and Spitzer 1993; see also Kahneman, Knetsch, and Thaler 1991; Thaler 1980) demonstrates that people fail to anticipate their attachment to a certain object after they have taken ownership. Consequently, they often demand twice as much money to part with an object as they would pay to acquire that object in the first place. With regard to variety seeking, people are inaccurate when predicting their own preference for a particular snack (Ratner, Khan, and Kahneman 1999; Read and Loewenstein 1995; Simonson 1990). They anticipate that they will tire of their favorite flavor after initial consumption without realizing that their craving for it will soon rebound to its original level.

Parallel to these unfortunate prediction errors, when assessing their expectancy related to a goal, consumers exhibit a similar naïveté and fail to anticipate how their commitment might change while pursuing a goal. Instead, they prioritize the subgoals on the basis of what they believe is the easiest combination of tasks. Conventional wisdom suggests that a person's energy level will decrease as (s)he expends more effort during a pursuit (e.g., Baumeister et al. 1998; Vohs and Faber 2007). For example, people tire after running for five miles and become bored after visiting a store five times in a row. Therefore, to maximize their likelihood of attaining the overall goal, people place the more difficult subgoal at the beginning so that they can tackle the more challenging task with a high energy level. Similarly, the literature on preference for improvement (Loewenstein and Prelec 1993; Ross and Simonson 1991) has also suggested that when making decisions involving multiple phases, people often prefer an unpleasant-to-pleasant outcome sequence because this improving sequence enables them to experience a continual series of positive departures from their adapted level. Accordingly, they should display a preference for a difficult-to-easy (vs. an easy-to-difficult) subgoal sequence.

Objectively, people may be correct in assuming that when total effort is equal, a difficult-to-easy sequence may be easier than the reverse, presumably because of the higher fatigue level experienced toward the end of the pursuit. However, they fail to anticipate the change in their own commitment and the increased motivation that they will experience related to the overall goal after they have accomplished the initial subgoal. The analysis leads to our prediction that when completing an overall goal that is broken down into subgoals, although people often prefer a difficult-to-easy subgoal sequence, they perform better in an easy-to-difficult subgoal sequence.

It is important to note that based on our reasoning, this prediction should only hold when subgoals have no benefit of their own, in which case people consider only the likelihood of accomplishing the entire goal and do not factor in the benefits of reaching each individual subgoal. In situations in which accomplishment of subgoals comes with benefits, people may focus on the early benefits associated with quickly accomplishing an easy subgoal, and therefore, we expect their preferences to shift accordingly.

In the following sections, we report seven studies that demonstrate this hypothesized discrepancy in consumers' preferences and their actual performance in goals with a subgoal structure. Importantly, although we derive our hypothesis on the basis of the reasoning that people are unable to correctly anticipate their goal commitment—and we provide some initial evidence for this hypothesized mechanism—this investigation primarily focuses on conclusively demonstrating the robustness of this discrepancy. We hope that this initial effort can lay a solid foundation for future investigations and provide important support for a full analysis of the underlying mechanism.

#### STUDY 1: SIT-UPS

The participants in Study 1 were required to complete 70 sit-ups in two phases that followed either a difficult-to-easy or an easy-to-difficult subgoal sequence. We assessed their willingness to initiate this goal and their actual performance depending on the conditions.

#### Method

Two hundred forty-nine female undergraduate students at a major public university participated in the experiment. It involved a 2 (action: goal adoption vs. goal completion)  $\times$  2 (subgoal sequence: easy-to-difficult vs. difficult-to-easy) between-subjects design.

The participants were told that the experimenters were investigating how the human body functions by testing the effectiveness of sit-ups in burning stomach fat. Participants learned that their task was to complete 70 sit-ups in two phases and that they were required to complete the entire task within seven minutes.

We manipulated the sequence of the subgoals by varying the number of sit-ups in each phase. In the easy-to-difficult condition, participants were told that they would do 20 sit-ups to complete Stage 1 and 50 sit-ups to complete Stage 2 and that there would be no break time between the two phases. Participants were also informed that, after completing Stage 1 (20 sit-ups), the experimenter would notify them that they were starting the second phase by flipping a “stage

card.” We used this card to ensure that participants were fully aware of their status during the pursuit and to reinforce the feeling that they were either in the initial stage or the more advanced stage of the pursuit. The difficult-to-easy sequence condition followed an identical set of procedures, except that Stage 1 required 50 sit-ups and Stage 2 required 20 sit-ups. The participants were informed that they would receive \$5 in cash if they completed the entire session, but that they would receive nothing if they started the task but failed to complete it.

In the goal adoption conditions, after participants learned the rules and whether they would need to follow a difficult-to-easy or easy-to-difficult sequence, they were asked to indicate whether they would like to participate in the experiment. To ensure that the people who decided to participate truly expected to complete the goal instead of merely attempting it, we offered them \$2 in cash just for showing up, regardless of whether they decided to participate. We measured how many people chose to participate as an indicator of their motivation to adopt the goal. After indicating their choices, the participants were led to a different room to be debriefed and compensated. People in these conditions did not actually complete the sit-ups.

In the goal completion conditions, participants went directly into the sit-up session after the instructions and were not given the choice of whether to participate. They completed the study individually in separate experimental rooms. The experimenter counted the number of sit-ups that participants completed. After completing 70 sit-ups or quitting before completion, participants were debriefed, and each of them received \$5 as compensation.

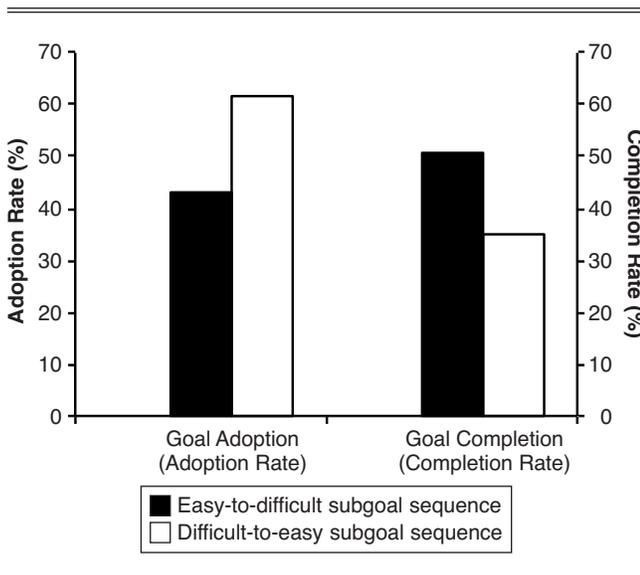
#### Results and Discussion

In the goal adoption conditions, 61.5% of the participants who were asked to perform the task following a difficult-to-easy subgoal sequence chose to adopt the goal. In comparison, only 43.1% of participants who were asked to complete the task following an easy-to-difficult subgoal sequence chose to adopt the goal ( $\chi^2(1, N = 130) = 4.44, p < .05$ ). Notably, the actual completion rates of the participants in the goal completion conditions showed an opposite pattern: only 35% of participants who followed a difficult-to-easy subgoal sequence completed the goal, whereas 50.8% of those who followed an easy-to-difficult sequence completed the goal ( $\chi^2(1, N = 119) = 3.05, p < .1$ ) (see Figure 1).

One question is whether the people who did not complete all 70 sit-ups showed the same motivational pattern as those who did. Indeed, we found that participants in the easy-to-difficult subgoal sequence condition completed more sit-ups before giving up ( $M = 37.52$ ) than those in the difficult-to-easy sequence condition ( $M = 32.18; t(66) = 2.04, p < .05$ ).

We theorize that people who pursue an easy-to-difficult subgoal sequence exhibit more motivation because they experience greater commitment to the goal after completing the initial subgoal, whereas people who pursue a difficult-to-easy goal give up because they fail to achieve a meaningful subgoal after making an initial effort. If this is accurate, our participants' behaviors should differ after completing between 20 and 49 sit-ups, depending on the conditions. During this period, people in the easy-to-difficult sequence condition would have reached Stage 2, whereas those in the

Figure 1  
ADOPTION RATE AND COMPLETION RATE AS A FUNCTION OF ACTION AND SUBGOAL SEQUENCE (STUDY 1)



difficult-to-easy condition would still be in Stage 1. We expect those in the former group to exhibit a lower tendency to quit during this period compared with those in the latter group. Our analysis confirmed this hypothesis: participants in the easy-to-difficult subgoal condition were less likely to quit after completing between 20 and 49 sit-ups (37.3%) compared with those in the difficult-to-easy sequence condition (56.7%;  $\chi^2(1, N = 119) = 4.48, p < .05$ ), which again supports our hypothesis that people who have experienced initial subgoal success are less likely to give up on the goal.

The findings from Study 1 bolster our hypothesis that although people prefer goals with difficult-to-easy subgoal sequences, they are actually more likely to complete goals with easy-to-difficult subgoal sequences. In this study, participants who chose to adopt the goal in the goal adoption conditions did not actually complete the sit-ups. This leaves unanswered the question of whether these participants would behave similarly to those who were randomly assigned to the goal completion conditions. Our next study explores these effects.

#### STUDY 2: A LOYALTY PROGRAM

In Study 2, we launched a customer loyalty program and varied whether people were required to complete a set of purchases following a difficult-to-easy or an easy-to-difficult subgoal sequence. As dependent variables, we assessed both the likelihood of people joining the program and their actual purchasing behaviors.

#### Method

This study used a 2 (action: goal adoption vs. goal completion)  $\times$  2 (subgoal sequence: easy-to-difficult vs. difficult-to-easy) between-subjects design. We launched a customer loyalty program in cooperation with a local yogurt shop. The shop is located near the city's business center and sells fresh yogurt in a variety of flavors. Customers are primarily

businesspeople and students from nearby colleges. The loyalty program required the purchase of seven full-price yogurts (approximately \$1 each) to receive a coupon that was worth two free yogurts.

Although all the loyalty cards required seven stamps to be collected at two separate stages, the cards differed in how many stamps were needed to complete those two stages: the easy-to-difficult subgoal sequence required two stamps to complete Stage 1 and five additional stamps to complete Stage 2, whereas the difficult-to-easy sequence required five stamps for Stage 1 and two additional stamps for Stage 2. Specifically, the rules stated that customers needed to collect two types of stamps: an "M" stamp and an "S" stamp (the name of the store was MS Yogurt). In the difficult-to-easy subgoal sequence conditions, people needed to collect five "M" stamps to complete Stage 1 and two additional "S" stamps to complete Stage 2, which concluded the entire program. In the easy-to-difficult subgoal sequence conditions, participants needed to collect two "M" stamps for Stage 1 and five additional "S" stamps for Stage 2. Each purchase of a full-price yogurt earned a stamp, and depending on how many stamps were already on the card, participants would either receive an "M" or an "S" stamp. Thus, there was no difference in the action performed to receive an "M" stamp versus an "S" stamp, and the two letters were counterbalanced within the conditions.

We then manipulated goal adoption and completion by informing customers about whether they needed to activate their cards before beginning to accumulate stamps. In the goal adoption condition, people were required to return on a different day (i.e., not the day of issuance) to activate the card, and then they could begin earning stamps on subsequent trips (i.e., not including the initial visit). In doing so, we were able to measure people's interest in adopting the goal by assessing whether they were willing to visit the shop again to formally initiate the pursuit. In the goal completion conditions, customers received "activated" cards and were told that they could begin accumulating stamps during their next visit to the store.

We randomly distributed these cards at the store to 800 customers (200 for each condition) during the second week of March and marked the cards' expiration date as May 15. To minimize cross-condition comparisons, we only offered the card to individual customers; we recorded their decision among those who actually showed interest and read the program rules. For each card, we recorded the dates of issuance and all subsequent visits to the store.

#### Results and Discussion

By the end of the program, 178 people had completed all of the required purchases and redeemed the coupon, yielding an ultimate redemption rate of 22.25%. Of the customers who received an inactive card (i.e., goal adoption conditions), 39.5% in the difficult-to-easy condition returned to activate the card and join the program, whereas only 29.5% in the easy-to-difficult condition did so ( $\chi^2(1, N = 400) = 4.43, p < .05$ ). Notably, the completion rates for people who received an activated card (i.e., goal completion conditions) showed the opposite pattern. Whereas 33.5% of customers in the easy-to-difficult sequence condition completed all of the necessary purchases, only 24.5% of those in the difficult-to-

easy sequence condition did so ( $\chi^2(1, N = 400) = 3.93, p < .05$ ; see Table 1). This important contrast again supports our hypothesis that although people prefer to initiate subgoals following a difficult-to-easy sequence, they are more likely to complete the goal when the subgoals follow an easy-to-difficult sequence.

Our previous analyses have not directly compared the redemption rates of the customers in the goal adoption condition with those of the customers in the goal completion condition because of a concern regarding a self-selection bias in the former group. However, we believe that these people's behavior still offers valuable information for both academics and practitioners because these people are exactly the types of actual customers that marketers encounter in the marketplace. Specifically, we found that people in the goal adoption conditions who chose to initiate the goal behave similarly to those in the goal completion conditions with respect to actual goal pursuit: 54.2% of participants who chose to initiate the goal that consisted of an easy-to-difficult subgoal sequence completed all of the required purchases, whereas only 37.97% of those who chose to initiate the goal that consisted of a difficult-to-easy subgoal sequence did so ( $\chi^2(1, N = 138) = 3.61, p < .06$ ; see Table 1).

In addition, consistent with findings from the previous study, customers in the easy-to-difficult sequence goal completion condition were less likely to quit after collecting between two and four stamps (11.9%) because they had accomplished the first subgoal, compared with those in the difficult-to-easy sequence goal completion condition (26.7%;  $\chi^2(1, N = 206) = 7.19, p < .01$ ). An analysis of customers who received an inactive card (i.e., goal adoption condition) and began to collect stamps showed the same pattern (12.8% in the easy-to-difficult condition; 31.7% in the difficult-to-easy condition;  $\chi^2(1, N = 110) = 5.37, p < .05$ ).

Thus, both the lab and the field experiments provide support for our hypothesis that although people exhibit greater motivation to adopt goals with difficult-to-easy subgoal sequences, they are actually more likely to accomplish goals with easy-to-difficult subgoal sequences. However, given that we limited our investigation to goals with only two subgoals for the sake of simplicity in both Studies 1 and 2, we gained little understanding of whether the findings are evident when there are more than two subgoals. Therefore, in Study 3, we relax this constraint and test the generalizability of the results.

### STUDY 3: 24-POINT PUZZLE GAME

In Study 3, we tested our proposed hypothesis with an arithmetic task. Participants in this study adopted or com-

pleted a goal that consisted of four sets of arithmetic problems ("the 24 game"). We assessed their likelihood to adopt and complete the goal.

### Method

One hundred eighty-one undergraduate students (116 women, 65 men) completed this study. This experiment employed a 2 (action: goal adoption vs. goal completion)  $\times$  2 (subgoal sequence: easy-to-difficult vs. difficult-to-easy) between-subjects design.

Participants were told that the experimenters were interested in people's arithmetic skills and that their task was to play 30 rounds of the 24 game. Our pretests indicated that participants were familiar with the 24 game, meaning that there should have been a minimal learning effect, thus making the game an ideal task for our experiment.

In the easy-to-difficult sequence condition, participants were told that the game had 30 rounds (i.e., one question per round), with the same level of difficulty. Participants were also told that these 30 questions were divided into four sessions, with 3, 6, 9, and 12 questions in each session, and that the game would be completed following this sequence. They were also informed that they could quit the study at any time if they did not want to continue. In contrast, participants in the difficult-to-easy sequence condition learned the same rules, except that they had to follow a 12  $\rightarrow$  9  $\rightarrow$  6  $\rightarrow$  3 subtask sequence when completing the overall goal of 30 questions (see Web Appendix A). A number at the top of each question page indicated which session they were in and how many questions they had completed.

After learning these rules, participants in the goal adoption conditions were informed that they could decide whether to participate in the study. They would receive a \$5 cash reward in addition to the \$2 participation fee if they initiated the task and completed all 30 rounds correctly, whereas they would receive nothing (not even the participation fee) if they failed to complete the 30 rounds. Again, to ensure that the people who chose to play the game truly expected to accomplish the goal, in the event that they declined to participate, we offered them \$2 just for showing up. We measured how many people chose to initiate this task as an indicator of their interest in adopting the goal. After indicating whether they would participate, these participants were led to a webpage that explained that the game had been canceled due to technical difficulties, and they were offered \$5 in cash as compensation. Thus, none of the participants in the goal adoption conditions actually played the game.

In comparison, the participants in the goal completion conditions were not provided with the opportunity to decide

Table 1  
THE RESULTS OF STUDY 2

	Goal Adoption		Goal Completion	
	Difficult-to-Easy	Easy-to-Difficult	Difficult-to-Easy	Easy-to-Difficult
Adoption rate (%) (only for goal-adoption condition)	39.5 <sub>a</sub>	29.5 <sub>b</sub>	—	—
Completion rate (%) (only for goal-completion condition)	—	—	24.5 <sub>a</sub>	33.5 <sub>b</sub>
Completion rate after adopting the goal (%) (only for goal-adoption condition)	37.9 <sub>a</sub>	54.2 <sub>b</sub>	—	—
Quitting rate after collecting between two and four stamps (%)	31.7 <sub>a</sub>	12.8 <sub>b</sub>	26.7 <sub>a</sub>	11.9 <sub>b</sub>

Notes: In the goal adoption and goal completion conditions, the means in the same row with different subscripts are significantly different at  $p < .05$ .

whether to participate, and the task commenced directly after the instructions. We assessed participants' motivation during the actual pursuit of the goal by inserting a long waiting period into the task. After the 10th round, participants encountered a loading page before the 11th question was presented. The page explained that they would have to wait their turn for the next question because only a limited number of computers could simultaneously access the server. If they preferred not to wait, they could quit at any time, skip the remaining questions, and leave the experiment, meaning that they would forfeit their opportunity to win the cash reward. This loading page stayed on the screen for 10 minutes and then transitioned into the 11th question. When interrupted by this loading page, participants in the difficult-to-easy condition were still in Stage 1, whereas participants in the easy-to-difficult condition had already reached Stage 3, even though all of them had completed the same number of subtasks and had the same number of remaining subtasks. We measured participants' motivation by recording the number of people who waited for the entire 10 minutes and completed the entire task of 30 questions.

Participants completed the study individually in separate experimental rooms. The sequence of the 30 questions was randomized, and the questions were presented one at a time. After either completing or quitting the task, all participants were debriefed, compensated, and dismissed.

### *Results and Discussion*

Consistent with the results of previous studies, participants who faced a difficult-to-easy subgoal sequence were more likely to adopt the goal (64.4%) than those who faced an easy-to-difficult subgoal sequence (43.5%;  $\chi^2(1, N = 91) = 4.02, p < .05$ ). The actual completion rates for participants who moved directly to the task showed the opposite pattern: participants who followed an easy-to-difficult subgoal sequence were more likely to finish the entire task despite the extended waiting period in the middle (68.9%), compared with those who followed a difficult-to-easy subgoal sequence (46.7%;  $\chi^2(1, N = 90) = 4.56, p < .05$ ). These findings again support our hypothesis that although a difficult-to-easy subgoal sequence encourages more goal adoption, people show greater motivation in the pursuit of goals that are structured in the reverse order, with the relatively easy subgoals met first.

Thus far, we have demonstrated that people erroneously prefer a sequence (i.e., difficult-to-easy) that they ultimately have trouble finishing. If this holds true, the most direct test would show that when people are instead given an easy-to-difficult sequence against their natural tendency to choose otherwise, they should, contrary to their expectations, achieve better success compared with those pursuing a difficult-to-easy sequence (e.g., following their own choice). We test this effect in Study 4.

### *STUDY 4: PRODUCT CUSTOMIZATION*

Study 4 aims to directly show that when consumers believe that they will do better in a meaningful task through a difficult-to-easy sequence, they ironically do better when they are instead given an easy-to-difficult sequence against their wishes. Participants in this study first chose which sequence they preferred to use to complete a product cus-

tomization task; a week later, they were randomly asked to complete the task following either an easy-to-difficult or a difficult-to-easy sequence. We assessed whether people who preferred a difficult-to-easy sequence in the first phase actually performed better when given an easy-to-difficult sequence in the second phase.

### *Method*

Two hundred sixty-nine undergraduate students (174 women, 95 men) at a major public university completed this study. This study was conducted in two phases. We first recruited participants to register and surveyed them on which sequence (easy-to-difficult vs. difficult-to-easy) they preferred to use to complete the customization one week before the product customization task. A week later, when participants visited the lab to complete the customization task, all participants were randomly assigned to conditions that required them to complete the task following either an easy-to-difficult or a difficult-to-easy sequence (i.e., between-subjects).

When participants were recruited during the first phase of the experiment, they were told that they were about to participate in a product customization study conducted by a running shoe manufacturer and that their task would be to play the role of a shopper and complete a seven-step running shoe customization task (Levav et al. 2010). Specifically, participants were told that they needed to configure seven features of a pair of running shoes for themselves. The seven features were "Upper," "Lining," "Sole," "Lace," "Air cushion," "Tongue," and "ID." For each feature, participants needed to communicate their preferences and requirements to the manufacturer by answering a series of questions, including ranking, multiple-choice, and several open-ended questions (see Web Appendix B). We divided the customization task into two separate stages and manipulated the subgoal sequence by varying the number of features in each stage. In the easy-to-difficult sequence conditions, participants needed to configure two features for Stage 1 and five additional features for Stage 2, and the reverse was true for the difficult-to-easy conditions. The order of features was randomized in these conditions. When recruiting participants to register online approximately one week before the actual task, we told them that the average time for completing each feature was approximately 15 minutes and that they could take a short break only after completing a stage (i.e., after either two or five features, depending on the condition). We told participants that only completed information would be useful to the manufacturer and offered those who could complete the entire customization task a chance to win a pair of customized running shoes in addition to the regular participation fee (\$3). We then told the participants that there were two sequences—an easy-to-difficult or a difficult-to-easy sequence—that they could follow when completing the task, asked them which sequence they preferred to follow, and told them that we would do our best to accommodate their requests.

One week later, when participants actually came to the lab to complete the customization task, the experimenter apologized, claiming that the manual assignment system was down, that we were unable to match their preference with the actual sequence, and that the participants had to comply

with the computer's random assignment. Therefore, regardless of their choice when signing up, all of the participants were randomly asked to complete the customization task following either a difficult-to-easy or an easy-to-difficult sequence. It is important to note that by design, some people had to complete a sequence that was different from their indicated preference and potentially could show signs of reactance. Although we are less concerned about this effect because reactance would have an effect opposite from our prediction (i.e., people who chose a difficult-to-easy sequence but were given the opposite sequence should be less engaged and perform worse than those who were given their preferred sequence), to minimize this influence, we inserted a one-week lag between measuring participants' preference and their actual completion of the task and offered a detailed explanation for the random assignment.

Participants were further told that there was no time limit and that they could take as much time as they needed to complete the task. They then commenced the customization task. Participants configured one feature on a single scrollable page, and we presented a progress bar on the top of the screen to illustrate their progress on the task. On each page, we also presented an "exit" button that allowed participants to skip the remaining steps at any point during the task, which would mean that they chose to forfeit the chance to win the customized running shoes and to receive only the participation fee. We then recorded whether people abandoned the task. After completing or quitting the task, the participants were debriefed, compensated, and dismissed.

### *Results and Discussion*

Two hundred sixty-nine participants registered and completed the survey and, a week later, came to the lab for the actual configuration task. For the choice of subgoal sequence, 58.7% of the participants chose the difficult-to-easy sequence, a percentage that was significantly higher than the random rate (50%;  $p < .001$ ), confirming that people did show a significant preference for this order. Ironically, when they were actually completing the goal in the second week, 69.1% of the participants who were assigned into the easy-to-difficult sequence condition completed the entire task successfully, compared with only 49.6% of participants who were assigned into the difficult-to-easy sequence condition ( $\chi^2(1, N = 269) = 10.60, p = .001$ ). In particular, among the participants who chose a difficult-to-easy sequence at the adoption stage, those who were instead given an easy-to-difficult sequence were more likely to complete the entire task (73.3%) than those who were given a difficult-to-easy sequence (55.6%) as they requested ( $\chi^2(1, N = 158) = 5.41, p < .05$ ). As a benchmark for comparison, among participants who chose an easy-to-difficult sequence at the adoption stage, those who were given their preferred sequence were more likely to complete the whole task (62.0%) than those who were given a difficult-to-easy sequence (42.6%) at the goal completion stage ( $\chi^2(1, N = 111) = 4.13, p < .05$ ). These findings provide direct evidence in support of our prediction that people who chose the difficult-to-easy sequence were indeed making a mistake: they would be less likely to complete the task had they been allowed to follow their own choices.

It is important to note that because we assigned some participants to a sequence that they did not willingly choose, there is the potential concern of possible reactance. Our additional analysis showed that whether the assigned sequence conflicted with participants' previous choices had no effect on their goal completion rate ( $\beta = -.10$ , Wald  $\chi^2(1, N = 269) = .15$ ; n.s.), which indicated that the inconsistency between the chosen sequences (in goal adoption stage) and the assigned sequences (in goal completion stage) did not interfere with performance.

Study 4 offers direct evidence that people indeed make mistakes when they show a preference for a difficult-to-easy subgoal sequence. We suggest that this erroneous preference occurs because when people deliberate between which subgoal to pursue first, they are unable to accurately anticipate the increase in experienced commitment following a successful subgoal. If this is true, consumers should still (erroneously) prefer a difficult-to-easy subgoal sequence even when they are reminded to consider their future commitment. Our next study explores that possibility with the goal of offering some initial evidence of the reasons that people make mistakes in such decisions.

### *STUDY 5: HANDGRIP*

Unlike our previous studies, which allowed people to move directly to their adoption decisions, Study 5 explicitly required participants to consider the commitment they would experience in the pursuit after completing an initial easy subgoal. We assessed whether this manipulation swayed their adoption decisions.

#### *Method*

One hundred eighty-eight male undergraduate students completed this study for monetary compensation. This experiment employed a 2 (subgoal sequence: easy-to-difficult vs. difficult-to-easy)  $\times$  2 (goal commitment: reminded vs. not reminded) between-subjects design. Participants were provided with a cover story that the researchers were testing the functions of a handgrip and that their task was to hold the handgrip tightly for 180 seconds. We required participants to complete the test with their nondominant hands to avoid the large variance in the dominant hands' strength (Innes 1999). Male students averaged approximately 140 seconds (SD = 27.4) in pretests; therefore, we set the overall goal at 180 seconds to elicit the maximum effort while simultaneously ensuring a healthy variance in the completion rates.

All participants were provided with an opportunity to familiarize themselves with the handgrip. We then told the participants that the test required them to finish the 180 seconds in two sessions, that they could only briefly release the grip between sessions, and that there would be no break time before continuing. Participants in the easy-to-difficult condition were told that the first session would be 60 seconds and the second session would be 120 seconds, whereas those in the difficult-to-easy condition were told that the first session would be 120 seconds and the second session would be 60 seconds (see Web Appendix C).

Similar to previous studies, participants were informed that they would receive a \$5 reward if they chose to participate in the experiment and completed the entire session successfully, whereas they would only receive \$2 if they chose to start

but failed to complete the entire goal. To discourage people from merely attempting the task, we also offered them \$3 just for showing up if they decided not to participate.

Participants were also informed that they would encounter questions about the experimental design. Among the filler items, we specifically reminded participants of the commitment to the goal that they would experience during the pursuit by asking them to predict the extent to which they would feel committed to finishing the entire task after holding the grip for 80 seconds (i.e., “Suppose you have already held the grip for 80 seconds, how committed would you feel at that time to continue holding the grip for another 100 seconds to complete the entire task?” 1 = “not at all,” and 11 = “extremely”). Importantly, for participants in the commitment-reminded conditions, these questions appeared after they learned that they had to follow either a 60- → 120-second sequence or a 120- → 60-second sequence and before they decided whether to participate. Participants in the commitment-not reminded conditions answered the same questions to ensure consistency across conditions, but they did so after deciding whether to initiate the task.

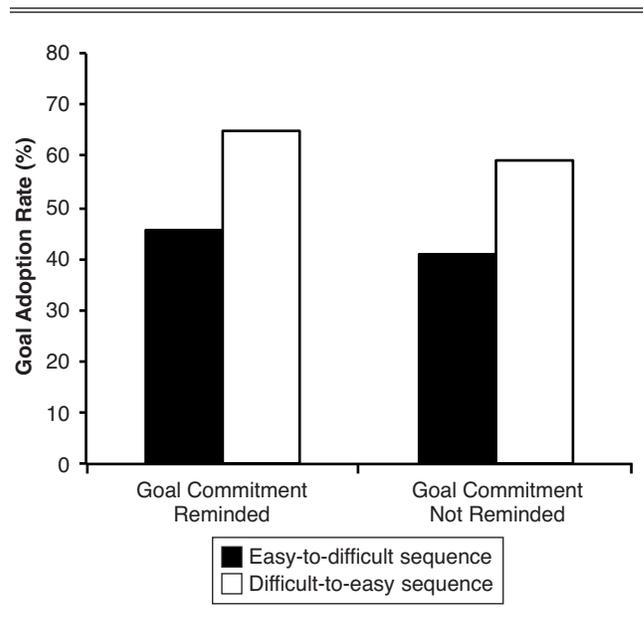
After answering the questions, participants who chose to initiate the trial in all conditions commenced with the task. Throughout the duration of the task, participants could see on a screen how many seconds they had already persisted and which session they were in. At the end of the study, all participants were debriefed, compensated, and dismissed.

### Results and Discussion

**Goal adoption.** A logistic regression on the goal adoption rates yielded the main effect of the subgoal sequence ( $\beta = .38$ , Wald  $\chi^2(1, N = 188) = 6.56, p < .01$ ), and no significant interaction emerged in this analysis ( $\beta = .01$ , Wald  $\chi^2(1, N = 188) = .01$ , n.s.), suggesting that participants who faced a difficult-to-easy subgoal sequence were more likely to initiate the task (62.1%) than were those who faced an easy-to-difficult subgoal sequence (43.0%), regardless of whether they were reminded to think about their goal commitment before making a goal adoption decision (see Figure 2). This lack of an interaction effect offers initial evidence of the reasons people make mistakes in goal adoption decisions: people preferred the difficult-to-easy subgoal sequence regardless of whether they were reminded of the commitment they might feel during the pursuit, indicating that it is unlikely that this erroneous choice was caused by neglecting the correctly anticipated commitment. Instead, it is more likely that people were simply unable to foresee this change in commitment.

The data regarding people’s anticipated commitment support this interpretation. An analysis of variance on the anticipated goal commitment yielded no significant effects of subgoal sequence ( $F(1, 184) < .01$ , n.s.), reminder of commitment, ( $F(1, 184) = .08$ , n.s.), or their interaction term ( $F(1, 184) = .65$ , n.s.). There was no difference in anticipated goal commitment between the easy-to-difficult sequence ( $M = 4.56$ ) and the difficult-to-easy sequence ( $M = 4.58$ ) conditions, and this was true regardless of whether participants made the prediction before ( $M_{\text{difficult-to-easy}} = 4.67$  vs.  $M_{\text{easy-to-difficult}} = 4.36$ ; n.s.) or after ( $M_{\text{difficult-to-easy}} = 4.48$  vs.  $M_{\text{easy-to-difficult}} = 4.76$ ; n.s.) their goal adoption decisions,

Figure 2  
GOAL ADOPTION AS A FUNCTION OF GOAL COMMITMENT  
REMINDING AND SUBGOAL SEQUENCE (STUDY 5)



suggesting that people simply did not realize that the completion of an initial subgoal could increase their commitment.

**Goal completion.** Consistent with the previous studies, participants who chose to initiate the goal that had an easy-to-difficult subgoal sequence were more likely to complete the overall goal (87.5%) than those who followed a difficult-to-easy subgoal sequence (67.8%;  $\beta = -.60$ , Wald  $\chi^2(1, N = 99) = 4.03, p < .05$ ). No other significant effects emerged in this analysis.

By showing that participants’ preference for a difficult-to-easy subgoal sequence persists even after they are reminded of their future commitment, Study 5 also offers important insights into the process through which people make goal adoption decisions. In particular, we rule out the possibility that people are able to accurately anticipate their future commitment but ignore this information at the moment of choice. Importantly, we show in Study 5 that participants’ anticipated commitment did not differ between the two sequences, indicating that people were insensitive to how the structure of the goals may affect their commitment before goal initiation, thus confirming people’s inability to foresee how the completion of an initial subgoal can enhance their goal commitment.

Although it is important to show experimentally that people erroneously prefer a sequence that they have difficulty finishing, open questions remain regarding the extent to which these findings are relevant for real-world practices and how externally valid these findings are when people are allowed to create their own order for subgoals. With these objectives in mind, we conduct Study 6.

### STUDY 6: FREE MEAL

In Study 6, we launched another customer loyalty program and assessed people’s preferences for subgoal sequences and actual purchases. Unlike previous studies, customers in

this program created their own sequences, and we examined whether our findings remained accurate in that context.

### Method

Our customer loyalty program was launched in partnership with a small fast-food restaurant. The restaurant is located near the business center of a major city and serves ready-made hot lunches. Most of its customers are businesspeople and college students.

For all of the participating customers, each full-price purchase earned a stamp, and nine stamps on the loyalty card (i.e., the overall goal) could be redeemed for a \$5 voucher for future transactions. We measured participants' preferences for the subgoal sequences by allowing them to structure their own goals. For customers who were willing to sign up, we explained that the program was divided into two stages so that we could manage it and keep track of all of the transactions. Therefore, customers would need to return and obtain a fresh card after they finished the first card in the process of accumulating the necessary nine stamps. We assured them that this division was for management purposes only and had no impact on their benefits. They were allowed to choose from eight possible combinations (i.e.,  $1 \rightarrow 8$ ,  $2 \rightarrow 7$ ,  $3 \rightarrow 6$ ,  $4 \rightarrow 5$ ,  $5 \rightarrow 4$ ,  $6 \rightarrow 3$ ,  $7 \rightarrow 2$ , and  $8 \rightarrow 1$ ). For example, the " $1 \rightarrow 8$ " combination required one stamp to complete card 1 and then eight additional stamps on card 2 to complete the program, whereas the " $6 \rightarrow 3$ " combination required six stamps for card 1 and three additional stamps for card 2. The cards were identical in design except for the number of slots for the stamps.

We prepared 100 pairs of cards for each possible combination. Therefore, 800 pairs of cards were available at the beginning of the program. Enrollment was open for three days during the second week of July, and the cards were marked to expire on August 31. We invited individual customers at the restaurant to sign up for this program and recorded their decision among those who actually showed interest and read the program rules. For each adopted card, we recorded the dates of all subsequent purchases.

### Results and Discussion

After the three-day adoption period, 443 customers joined the program. By August 31 (the expiration date), 74 people had completed all purchases, yielding an eventual redemption rate of 16.7%. As a test of our main hypothesis, we categorized the eight combinations of subgoals into two groups—the easy-to-difficult sequences (i.e.,  $1 \rightarrow 8$ ,  $2 \rightarrow 7$ ,  $3 \rightarrow 6$ , and  $4 \rightarrow 5$ ;  $n = 400$ ) and the difficult-to-easy sequences (i.e.,  $5 \rightarrow 4$ ,  $6 \rightarrow 3$ ,  $7 \rightarrow 2$ , and  $8 \rightarrow 1$ ;  $n = 400$ )—and then analyzed customers' adoption behaviors. Between these two groups, participants chose 277 difficult-to-easy sequence cards (70.8%), whereas they chose only 166 easy-to-difficult sequence cards (41.5%;  $\chi^2(1, N = 800) = 69.10$ ,  $p < .01$ ), suggesting that people preferred a difficult-to-easy (vs. easy-to-difficult) subgoal sequence to meet a superordinate goal when they were able to choose their own goal structures. In comparison, the analysis of participants' actual goal completion showed that 21.7% of the customers who chose to initiate an easy-to-difficult subgoal sequence completed all of the required purchases relative to only 13.7% of those who chose to initiate a difficult-to-easy

sequence ( $\chi^2(1, N = 443) = 4.74$ ,  $p < .05$ ). Taken together, Study 6 demonstrates that consumers, when structuring their own subgoals, still erroneously prefer a difficult-to-easy (vs. easy-to-difficult) sequence, which actually hinders their successful attainment of the overall goal.

We believed that one important reason that people erroneously prefer a difficult-to-easy sequence is that the subgoals do not provide any benefits by themselves, rendering the achievement of individual subgoals meaningless, in turn leading people to focus solely on what they believe to be the optimal strategy to help them accomplish the entire goal. Whenever subgoals are valuable by themselves, however, we expect that the preference for difficult-to-easy sequence would disappear or even be reversed, depending on the value of those subgoals. We explore this boundary condition in this final study.

### STUDY 7: SIGNING UP FOR A LOYALTY PROGRAM

In Study 7, we launched a customer loyalty program that required consumers to complete a set of purchases following either a difficult-to-easy or an easy-to-difficult sequence. We varied whether the subgoals were valueless or valuable by themselves and assessed consumers' willingness to join the program.

### Method

This experiment used a 2 (subgoal sequence: easy-to-difficult vs. difficult-to-easy)  $\times$  2 (subgoal value: valueless vs. valuable) between-subjects design. We provided this customer loyalty program in cooperation with a local bakery, whose customers were mainly businesspeople and students from nearby colleges. The loyalty program required ten in-store purchases to receive a \$6 coupon.

The manipulations of the subgoal sequences were similar to those in the Study 2. Specifically, the rules stated that customers needed to collect two types of stamps: a "blue bird" stamp and a "red bird" stamp. In the easy-to-difficult subgoal sequence conditions, customers needed to collect three red bird stamps to complete Stage 1 of the program and then needed to collect seven additional blue bird stamps to complete Stage 2 (and therefore, the entire program). In the difficult-to-easy subgoal sequence conditions, customers needed seven red bird stamps for Stage 1 and three blue bird stamps to complete Stage 2. Each purchase would earn one stamp (with a one-stamp maximum per trip), and depending on how many stamps were already on the card, participants would receive either a red bird stamp or a blue bird stamp. The two stamp colors were counterbalanced within the conditions.

We then manipulated the subgoal value by telling customers whether they could redeem the partially completed card after finishing Stage 1. In the valueless subgoal conditions, we told customers that they could redeem the \$6 coupon only after they had collected all ten stamps (i.e., after they had completed both stages). In comparison, customers in the valuable subgoal conditions were allowed to redeem the partially completed card as soon as they had completed the initial subgoal (i.e., Stage 1), and they could go on to collect more stamps to redeem for the remaining value if they reached a total of ten stamps. We determined the redemption value of the subgoals on the basis of the

number of stamps collected proportional to the overall goal. Specifically, those in the easy-to-difficult valuable subgoal condition could redeem for a \$1.80 coupon after completing the initial subgoal (i.e., collecting three of ten stamps), whereas those in the difficult-to-easy valuable subgoal condition could redeem for a \$4.20 coupon after completing the initial subgoal (i.e., collecting seven of ten stamps).

We randomly offered these cards to 300 individual customers at the bakery, invited them to sign up for the program, and recorded their decision among those who actually showed interest and read the program rules. Note that our previous studies have repeatedly demonstrated that an easy-to-difficult (vs. difficult-to-easy) subgoal sequence leads to better success in actual goal completion and that the primary study objective was to demonstrate that when subgoals are valuable by themselves, the erroneous preference should disappear. Therefore, for reasons of cost we did not actually run the loyalty program but instead briefed the customers about the nature of the study after they had indicated their willingness to participate.

### Results and Discussion

The logistic model regressed the signing up (goal adoption) rate on the subgoal sequence, subgoal value, and their interaction term, yielding the predicted subgoal sequence  $\times$  subgoal value interaction ( $\beta = .38$ , Wald  $\chi^2(1) = 10.35$ ,  $p = .001$ ). Specifically, when subgoals were valueless, 53.1% of customers in the difficult-to-easy condition decided to sign up, compared with only 32.5% of customers in the easy-to-difficult condition ( $\chi^2(1, N = 158) = 6.85$ ,  $p < .01$ ), a pattern that replicated the findings in previous studies. Notably, the pattern reversed when subgoals were valuable: more customers decided to sign up for the program in the easy-to-difficult condition (61.3%) than in the difficult-to-easy condition (43.9%;  $\chi^2(1, N = 142) = 3.90$ ,  $p < .05$ ; see Figure 3). Together, this pattern of results has some important implica-

tions: when subgoals carry value, people no longer focus solely on the completion of the overall goal and instead consider the benefits that they may obtain along the way, which, interestingly, alleviates their erroneous preference for a difficult-to-easy sequence in goal-adoption decisions. This again demonstrates that the costly preference for a difficult-to-easy sequence is caused by consumers' dominant desire to accomplish the overall goal and is only likely to hold when individual subgoals are valueless.

### GENERAL DISCUSSION

When deciding whether to initiate a goal or the optimal strategy for pursuing a goal, people often rely on their predictions about the difficulty of goal attainment. What they fail to factor in, however, is how committed they will feel toward the goal after they have enjoyed some early success and how much increased effort they might be willing to exert to further pursue that goal. Consequently, people sometimes bypass goals that they would have a good chance of accomplishing and erroneously adopt goals that may be less attainable.

This research investigates this phenomenon in the context of prioritizing subgoals. We find that when facing goals that consist of difficult and easy subgoals, people prefer to begin with subgoals that are more difficult and believe that this approach makes their overall pursuit more attainable. However, they are more likely to complete the overall goal when they first achieve the relatively easy subgoals. Seven studies in different contexts reliably demonstrate the robustness of this mismatch (see Table 2).

Study 1 demonstrates the basic effect that although people prefer goals with a difficult-to-easy subgoal sequence, they are actually more likely to finish goals with an easy-to-difficult subgoal sequence. Study 2 shows the same pattern among actual consumers in a customer loyalty program. Study 3 uses multiple subgoals to demonstrate that people prefer difficult-to-easy subgoal sequences but show greater motivation in the pursuit of goals that are structured in reverse order. Through a product customization task, Study 4 directly illustrates that people who chose to complete a task following a difficult-to-easy sequence ironically did better when asked to complete the task in the reverse order. Study 5 further demonstrates that this erroneous preference was immune to reminders about potential changes in goal commitment, suggesting that people are simply unable to anticipate such changes. Using another customer loyalty program, Study 6 shows that this erroneous preference remains even when people structure their own subgoals. Finally, Study 7 explores a boundary condition and shows that when subgoals come with benefits, people focus on the early benefits associated with quickly accomplishing an easy subgoal and shift the preference to an easy-to-difficult sequence.

Subgoals have important implications for successful goal attainment (Carver and Scheier 1990; Gollwitzer 1999; Shah and Kruglanski 2003; Vallacher and Wegner 1987). This research highlights the discrepancy between people's expected and actual outcomes in goal pursuit when subgoals are involved. Although the present research focuses on the sequence of subgoals, we believe that our findings have broader implications for research regarding feedback in

Figure 3

GOAL ADOPTION AS A FUNCTION OF SUBGOAL VALUE AND SUBGOAL SEQUENCE (STUDY 7)

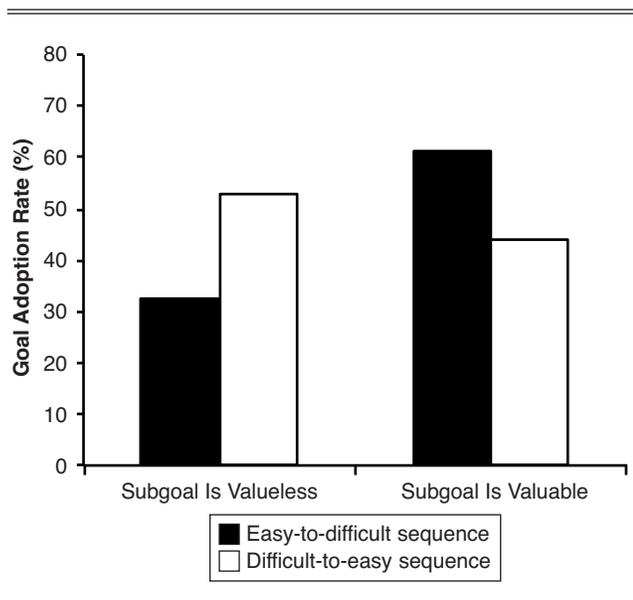


Table 2  
RESULTS SUMMARY (STUDIES 1–7)

		Goal Adoption				Goal Completion					
		<i>N</i>	<i>Difficult-to-Easy %</i>	<i>Easy-to-Difficult %</i>	<i>Statistics</i>	<i>p-Value</i>	<i>N</i>	<i>Difficult-to-Easy %</i>	<i>Easy-to-Difficult %</i>	<i>Statistics</i>	<i>p-Value</i>
Study 1		130	61.5	43.1	$\chi^2 = 4.44$	<.05	119	35.0	50.8	$\chi^2 = 3.05$	<.1
Study 2		400	39.5	29.5	$\chi^2 = 4.43$	<.05	400	24.5	33.5	$\chi^2 = 3.93$	<.05
Study 3		91	64.4	43.5	$\chi^2 = 4.02$	<.05	90	46.7	68.9	$\chi^2 = 4.56$	<.05
Study 4		269	58.7	41.3	Binomial test	<.01	269	49.6	69.1	$\chi^2 = 10.60$	<.01
Study 5		188	62.1	43.0	$\beta = .38$ , Wald $\chi^2 = 6.56$	<.01	99	67.8	87.5	$\beta = -.60$ , Wald $\chi^2 = 4.03$	<.05
Study 6		800	70.8	41.5	$\chi^2 = 69.10$	<.01	443	13.7	21.7	$\chi^2 = 4.74$	<.05
Study 7	Valueless subgoal	158	53.1	32.5	$\chi^2 = 6.85$	<.01	—	—	—	—	—
	Valuable subgoal	142	43.9	61.3	$\chi^2 = 3.90$	<.05	—	—	—	—	—

goal pursuit and, even more broadly, the dynamic nature of consumer motivation. On a conceptual level, the achievement of an easy subgoal constitutes positive feedback that can take different forms. For example, recent findings have shown that even irrelevant environmental cues can influence people's mindsets, including their goal persistence levels (Zhao, Lee, and Soman 2012). This feedback is particularly important when commitment to a goal is uncertain (Amir and Ariely 2008; Koo and Fishbach 2008). Our findings suggest that although its effect is often not fully appreciated before goal initiation, positive feedback should be provided early in the process to elicit enhanced commitment and to ensure successful goal attainment. Our findings have important implications for research on optimism bias (Buehler and Griffin 2003; Loewenstein, O'Donoghue, and Rabin 2003; Taylor and Brown 1994). The overarching finding in this field shows that people tend to be unrealistically optimistic (Weinstein and Klein 1995; Whitley and Hern 1991) and that they consistently overestimate their future accomplishments (e.g., Burger and Burns 1988; Chambers, Windschitl, and Suls 2003). Our results indicate that the opposite may also be true in that people sometimes underestimate their commitment and ability to achieve certain goals. As we have demonstrated, subgoals seem to make a difference. The achievement of subgoals may elevate people's efforts to a level that they had not anticipated before goal initiation, resulting in mispredictions of future achievements.

The present findings also have important implications for research regarding the relationship between performance and goal difficulty. For example, Cochran and Tesser (1996) find that performance increases when people set relatively difficult goals for themselves, presumably because their efforts increase with the task demands (see also Locke and Latham 1990; Oettingen and Mayer 2002). Our results show a pattern consistent with their overall findings—that is, people perform better in an easy-to-difficult sequence that is objectively more difficult than the reverse order, despite their erroneous belief to the contrary before goal initiation. Our findings contribute to this body of literature by showing that a more challenging goal can elicit greater performance even in situations in which people do not anticipate the goal as being more difficult. It is the moment-to-moment experience during the pursuit, rather than planning before goal ini-

tiation, that elicits the greater efforts needed to accomplish the more challenging goal. Although goal choice relies on people's anticipated experience of goal pursuit, we demonstrate that completion may depend more on people's actual experiences; in turn, this gap is responsible for costly mistakes related to goal choice.

One important limitation of the present research is that although we have reliably demonstrated the existence of the erroneous preference for the subgoal sequence and attributed its occurrence to consumers' failure to anticipate how initial success can enhance their willingness to invest effort, evidence for this mechanism at the process level awaits further support from future studies. We treat this erroneous preference as a noteworthy bias because in a perfectly rational world, consumers should view goal pursuit as a dynamic process, such that goal adoption decisions should involve not only the properties of the goal but also people's own willingness to work on the goal. What makes the reversal in the present research particularly notable is that it seems the error occurs because people focus almost exclusively on the task on which they are about to embark but persistently ignore a factor with which they are supposedly much more familiar: their own desire to work on the goal.

People have an unfortunate tendency to ignore the dynamic aspect of their mental states when making a commitment. For example, the robust planning fallacy (Buehler and Griffin 2003; Buehler, Griffin, and Ross 1994) occurs, to some extent, because people fail to anticipate how their willingness to work on a task might decrease after they commit to it. Similarly, consumers often commit to variety that they later regret because their satiation level is ultimately lower than anticipated (Simonson 1990). Therefore, one worthwhile question for our newly discovered bias is whether there is an effective remedy—and, if so, what it might look like.

To offer a speculative answer to these questions, it is important to note that not all participants succumbed to this fallacy in our studies. Indeed, a nontrivial number of participants accurately chose the subgoal sequence that better facilitated their eventual accomplishment. A close examination of Study 5 offers some interesting leads on the available options to help consumers improve their choices. As this study demonstrates, consumers, for the most part, do not anticipate that early success could enhance their com-

mitment to a goal, even when they are directed to think about how they might feel at that point. In other words, they simply fail to consider themselves adaptive agents whose commitment and effort might change as they make progress toward the goal. This insight offers a glimpse into what underlies the bias and a possible effective intervention: we should not only improve accuracy in predicting feelings but, more importantly, also emphasize the dynamic nature of goal pursuit and encourage people to view themselves as adaptive agents and to actively consider potential changes in their own mental state over time.

This suggestion runs parallel to the influential work by Dweck (1999, 2006), which identifies people as holding either a “fixed mindset,” believing that there is a fixed level of basic abilities and intelligence, or a “growth mindset,” believing that these basic abilities (and, therefore, performance) are dynamic and can be enhanced through hard work and perseverance (Dweck 2006). In the context of choosing a suitable goal, it is possible that consumers who hold the growth belief are more likely to view themselves as adaptive agents and to consider potential changes in their own efforts and performance at the time of a decision. By comparison, “fixers” may make a choice with a relatively static view in mind and prefer the sequence that, ironically, undermines their achievements in the end. These possibilities provide new directions for the test of boundary conditions to the observed effect and provide fruitful avenues for future investigations.

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## ONLINE APPENDIX

### Climbing the Wrong Ladder: The Mismatch between Consumers' Preference for Sub-Goal Sequences and Actual Goal Performance

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Ying Zhang\*

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#### **Appendix A: Experimental materials for Study 3**

*Page one (the instructions on page one are identical across all conditions)*

Thank you for your participation. This study aims to explore your arithmetic operation techniques. In this study, we will provide 4 sets of 24-point puzzle questions (30 in total) for you to solve. Please read the game's rules and the experimental instructions carefully.

##### 24-point game's rules:

Pick any 4 natural numbers between 1 and 13 and manipulate those numbers with the four basic arithmetic operations, which are addition, subtraction, multiplication, and division, to attain a final result of 24. For example, with numbers 1, 2, 3 and 4, we can use the following operation:  
 $(1+2+3)\times 4=24$ .

You can use the operation symbols multiple times, such as “+”, “—”, “×”, “÷” and “()”, but you can only use each number once in your operation.

There may be more than one correct answer for each question. For example, the numbers 1, 1, 3 and 6 can attain the result of 24 with different operations, such as  $(1 \times 1) + 3 \times 6 = 24$  or  $((1 + 1) + 6) \times 3 = 24$ . Any operational method with the correct procedure and result counts as a success. After you have fully understood the rules of the 24-point game, please click “Next” to enter the next page!

***Page two (the instructions on page two vary across all conditions)***

*The easy-to-difficult sequence conditions (instructions on page two)*

This experiment requires your completion of the following 4 groups (30 questions in total) of 24-point puzzle questions. For clarification purposes, we will use “session A”, “session B”, “session C” and “session D” to represent the 4 groups of questions.

Session A consists of 3 questions.

Session B consists of 6 questions.

Session C consists of 9 questions.

Session D consists of 12 questions.

The 4 sessions have 30 questions in total. The questions in each session only vary with regard to quantity. The 30 questions in this experiment have the same level of difficulty.

According to our previous study’s results, the average completion time for each question is approximately the same.

*The difficult-to-easy sequence conditions (instructions on page two)*

This experiment requires your completion of the following 4 groups (30 questions in total) of 24-point puzzle questions. For clarification purposes, we will use “session A”, “session B”, “session C” and “session D” to represent the 4 groups of questions.

Session A consists of 12 questions.

Session B consists of questions.

Session C consists of questions.

Session D consists of questions.

The 4 sessions have 30 questions in total. The questions in each session only vary with regard to quantity. The 30 questions in this experiment have the same level of difficulty. According to our previous study’s results, the average completion time for each question is approximately the same.

***Page three (the instructions on page three vary across all conditions)***

*The easy-to-difficult sequence conditions (instructions on page three)*

You have to complete the following “easy to difficult” sequence and correctly answer all 30 questions to achieve a \$5 cash reward in addition to the \$2 participation fee: “complete Session A (3 questions) -> complete Session B (6 questions) -> complete Session C (9 questions)-> and finally complete Session D (12 questions)”.

Individuals who follow our rules and successfully complete all 4 sessions with 30 questions in total will receive a \$5 cash reward in addition to the \$2 participation fee. Individuals who do not complete all 4 sessions/30 questions following the sequence described previously (even if they have completed 3 of the 4 sessions) will not receive the reward. The system will reconfirm

the results after you upload all the answers. You will not receive the reward and participation fee if any mistakes are evident.

This experiment has no time limit. You can take all the time you need until you are finished. You can also choose to quit at any point during this experiment. If you choose to quit, you will not receive the \$5 cash reward, but you will receive the \$2 participation fee.

Please click “Continue” to enter the next page and start the experiment! (for participants in the goal completion conditions)

Please click “Continue” to indicate whether you would like to participate in the experiment! Yes/No (for participants in the goal adoption conditions)

*The difficult-to-easy sequence conditions (instructions on page three)*

You have to complete the following “difficult to easy” sequence and correctly answer all 30 questions to achieve a \$5 cash reward in addition to the \$2 participation fee: “complete Session A (12 questions) -> complete Session B (9 questions) -> complete Session C (6 questions)-> and finally complete Session D (3 questions)”.

Individuals who follow our rules and successfully complete all 4 sessions with 30 questions in total will receive a \$5 cash reward in addition to the \$2 participation fee. Individuals who do not complete all 4 sessions/30 questions following the sequence described previously (even if they have completed 3 of the 4 sessions) will not receive the reward. The system will reconfirm the results after you upload all the answers. You will not receive the reward and participation fee if any mistakes are evident.

This experiment has no time limit. You can take all the time you need until you are finished. You can also choose to quit at any point during this experiment. If you choose to quit, you will not receive the \$5 cash reward, but you will receive the \$2 participation fee.

Please click “Continue” to enter the next page and start the experiment! (for participants in the goal completion conditions)

Please click “Continue” to indicate whether you would like to participate in the experiment!  
Yes/No (for participants in the goal adoption conditions)

## **Appendix B: Experimental materials for Study 4**

### *The first phase of experiment (goal adoption stage)*

#### *Page one*

You are about to participate in a product customization study conducted by a running shoe manufacturer and you will play the role of a shopper and complete a 7-feature running shoe customization task. These 7 features included "Upper", "Lining", "Sole", "Lace", "Air cushion", "Tongue" and "ID". For each feature, you need to communicate your preference and requirements to the manufacturer through ranking, multiple-choice and open-ended questions. The average time for completing each feature will be approximately 15 minutes.

Please note that because only information from completed customization is useful to the manufacturer, you should try your best to finish the entire customization task. If you do complete the entire task, you will be entered into a raffle to win a pair of customized running shoes on top of your regular participation fee (\$ 3).

#### *Page two*

You will complete this 7-feature customization task in two separate sections and there are two sequences that you can follow when completing the task: You can 1) configure two features first in section 1, take a brief break (30 seconds) and then complete five additional features in section 2, or 2) configure five features in section 1, take a brief break (30 seconds), and then complete two additional features for section 2. The computer will randomly determine exact order of features. Please indicate which sequence you prefer to follow when completing the task next week and we will do our best to accommodate your request.

*The second phase of experiment (goal completion stage)*

*Page one*

You are about to start the running shoe customization task that you signed up for. To refresh your memory, this customization task involves 7 steps, each on one feature of the shoes: "Upper", "Lining", "Sole", "Lace", "Air cushion", "Tongue" and "ID". For each feature, you need to communicate your preferences and requirements to the manufacturer by answering a series of questions and the average time needed for completing each feature will be approximately 15 minutes. Please try your best to complete the entire task. If you do complete the entire customization task, you will have a chance to win a pair of customized running shoes in addition to your regular participation fee (\$3).

There is no time limit and you can take as much time as you need to complete the task. If you decide not to continue at any point during the task, you may quit by clicking on the EXIT button and skip the remaining steps. Please note that quitting half way means that you will receive only the participation fee and forfeit the chance to win the customized running shoes.

NOTE: Although we surveyed your preference for the sequence that you would like to follow to complete the task and hoped that we could match your preferred structure with your task today, unfortunately our manual assignment system has been down since yesterday and we are unable to override the computer's random assignment. We sincerely apologize for this inconvenience, and please complete the task following the system's assignment. We thank you for your understanding.

*Page two (condition-specific information)*

You will complete the 7 features in the customizing task in two separate sections. You will first customize five (two) features in section 1, take a brief break (30 seconds) and then complete

the remaining two (five) features in section 2. Please try your best to complete the entire task. If you decide not to continue at any point during this study, you may click EXIT to skip the remaining steps.

Please click “Continue” to enter the next page and start the task!

## **Appendix C: Experimental materials for Study 5**

*Page one (the instructions on page one are identical across all conditions)*

Welcome! We are interested in testing the functions of a new handgrip in this study, and your task is to hold the handgrip tightly for 180 seconds.

### Task instructions and requirements:

Hold the grip tightly for 180 seconds. (This is only the task instruction; please do not start the task.)

1. The bottom part of the grip must be connected. It will immediately be considered a failed attempt if the bottom part is released.
2. Ensure that your elbow does not leave the desk.
3. The hand that you're using cannot touch the desk or walls.
4. Use your non-dominant hand.

Now, please use your non-dominant hand to practice holding this grip and hang on for 5 seconds following the previous requirements (This is only practice-not the real task!). After this practice, press "Next" for more detailed instructions.

*Page two (the instructions on page two vary across all conditions)*

*The easy-to-difficult sequence conditions (instructions on page two)*

This task requires you to follow the instructions and hold the grip as tight as you can for 180 seconds. We will divide the 180 seconds into two sections. The first section is 60 seconds and the second section is 120 seconds. You can only briefly release the grip between these sessions and there is no break time before continuing.

You will receive a \$5 reward if you choose to participate in this experiment and complete the entire session successfully. However, you will only receive \$2 if you choose to start but fail to complete the entire task (i.e., 180 seconds).

You will receive \$3 for showing up if you decide not to participate.

Press “Next” to answer some questions before indicating whether you want to participate (for participants in the goal commitment *reminded* conditions).

Press “Next” to indicate whether you want to participate (for participants in the goal commitment not reminded conditions).

*The difficult-to-easy sequence conditions (instructions on page two)*

This task requires you to follow the instructions and hold the grip as tight as you can for 180 seconds. We will divide the 180 seconds into two sections. The first section is 120 seconds and the second section is 60 seconds. You can only briefly release the grip between these sessions and there is no break time before continuing.

You will receive a \$5 reward if you choose to participate in this experiment and complete the entire session successfully. However, you will only receive \$2 if you choose to start but fail to complete the entire task (i.e., 180 seconds).

You will receive \$3 for showing up if you decide not to participate.

Press “Next” to answer some questions before indicating whether you want to participate (for participants in the goal commitment *reminded* conditions).

Press “Next” to indicate whether you want to participate (for participants in the goal commitment not reminded conditions).

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