

The different roads not taken:

Considering dissimilar foregone alternatives motivates future goal persistence.

Hye-young Kim, London School of Economics

([h.kim55@lse.ac.uk](mailto:h.kim55@lse.ac.uk))

Oleg Urminsky, University of Chicago Booth School of Business

([oleg.urminsky@chicagobooth.edu](mailto:oleg.urminsky@chicagobooth.edu))

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**Abstract**

Goal-inconsistent options that people previously considered but did not choose shape how they subsequently pursue their goals. Going beyond previous research, which showed that foregone alternatives influence consumers' experiences of the chosen option, the current research suggests that how consumers mentally construe foregone goal-inconsistent alternatives impacts how they evaluate their goal-consistent choice, which will in turn impact their motivation to continue goal-directed behaviors. Specifically, we find that when consumers consider having foregone dissimilar (vs. similar) foregone goal-inconsistent alternatives in favor of a goal-consistent action, they believe that they have made a greater sacrifice and had a higher impact on their active goals. As a result, they are then more likely to subsequently make goal-consistent choices. Our findings hold across different types of goals (saving: study 1, healthy eating: studies 2 and 3, exercise: studies 4 and 5), and extend to real choices (studies 3 and 5). We also identify boundary conditions for the observed effect.

*Keywords:* goals, motivation, foregone alternatives, variety

Imagine that you've recently set a goal to eat healthier, and you are now deciding which to have for dinner, either a spring salad with tofu or deep-fried chicken. You think back to your snack this afternoon, when you had chosen a healthy option, a green apple. How would you interpret this prior goal-consistent choice, and how would that interpretation affect the current choice?

We propose that how the previous healthy choice is assessed depends on which foregone alternatives to the choice are actively considered. When people think about their prior decisions, they can consider different kinds of counterfactual alternatives that could have been chosen instead. For example, a person who chose the green apple as a snack may view that choice in light of a diverse set of alternatives: they could have chosen dark chocolate chip cookies instead, or a glazed donut, or a banana nut muffin. Another person who chose the green apple may instead view that choice in light of a narrow range of foregone alternatives that are similar to each other: they could have chosen chocolate chip cookies, or peanut butter cookies, or M&M cookies. We propose that thinking of having previously made a goal-consistent choice as either overcoming a wide-ranging set of dissimilar tempting alternatives, or a narrow set of similar tempting alternatives, will affect people's perceptions about the impact of that choice on their goal, with consequences for the choices they currently face.

When people choose one option from a choice set, they have, by definition, foregone the other options. A wide range of consumer research has demonstrated that how people think about unchosen options can shape how they experience what they did choose (Carmon, Wertenbroch, Zeelenberg 2003; Dhar and Wertenbroch 2012; Sagi and Friedland 2007). However, less is known about whether and how considering past foregone options influences ongoing goal-

pursuit, where making consistent, repeated goal-congruent choices is critical for successful goal attainment.

People pursuing a goal often face conflict, needing to make choices between goal-consistent options (i.e., “virtues”) and goal-inconsistent options (“vices”). When people choose a goal-consistent option, they typically make progress that gets them closer to achieving their goal. The degree of realized goal progress is determined by the option they have chosen, regardless of the alternatives. For example, progress towards achieving a weight loss goal is determined by calories actually consumed, and progress towards a savings goal is determined by the amount of money actually saved, regardless of what the alternatives were.

However, without clear objective markers, it can be difficult for people to assess how much actual progress towards the goal has been caused by a single decision. Thus, people may monitor their goal pursuit using other available cues, including invested efforts (Zhang et al. 2010) and salient counterfactual actions (Dhar and Wertenbroch 2012). As a result, people may perceive the same goal-consistent choice as having made greater impact toward their goal when they consider a more diverse set of foregone temptations, representing greater effort and sacrifice to continue the goal pursuit. Further, the goal pursuit literature has suggested that perceptions of progress outweigh the effects of actual progress on consumers’ motivation and decision making (Kivetz, Urminsky and Zheng 2006; Huang, Zhang and Broniarczyk 2012; Soman and Shi 2003).

In contrast to prior research that explored the effect of variety among means that are conducive to goal attainment (e.g., three protein bars with the same vs. different flavors in pursuit of a fitness goal; Etkin and Ratner, 2012; 2013), our research focuses on the variety among *goal-inconsistent* alternatives that might have hindered goal attainment (e.g., three

unhealthy snacks with the same vs. different flavors). Previous research has shown that the existence of a goal-inconsistent alternative in a choice set influences consumers' satisfaction (Dhar and Wertenbroch 2012). Consumers derive more utility when they choose a virtue from a set that also includes vice option(s) compared to when choosing from a set with virtues only. We build on this finding to instead investigate the effect of *diversity* among the goal-inconsistent alternatives (i.e., the similarity or dissimilarity of the alternatives, rather than the mere presence of these alternatives), and the implications of diverse alternatives for subsequent motivation.

In our studies, we test how considering dissimilar (vs. similar) sets of foregone alternatives to a prior choice affects both perceived impact on goal-pursuit and current choices. Participants who either imagined, recalled, or actually engaged in a goal-consistent initial action considered a set of goal-inconsistent alternatives they could have chosen instead. Across three different types of goals (saving money: study 1; healthy eating: studies 2 and 3; exercise: studies 4 and 5), we found that when participants considered having foregone more dissimilar goal-inconsistent alternatives, they reported having made a greater sacrifice in choosing the goal-consistent option, with higher impact on their goal pursuit, and they were then more likely to make subsequent goal-consistent choices. Goal endorsement was a necessary pre-condition: considering dissimilar alternatives influenced goal perceptions only when participants considered the goal personally important. The effect of foregone-option diversity on choices was attenuated when the prior and subsequent choices contributed to the same subgoal, as opposed to when the prior and subsequent choices were separated and individually contributed to the broader superordinate goal (study 4). Consideration of past foregone alternatives was found to impact both hypothetical choices (studies 1 and 3) and real, incentive-compatible choices (studies 4 and 5).

## THEORETICAL DEVELOPMENT

### *Foregone alternatives in goal-pursuit*

Consumers are often sensitive to contextual cues, both when making choices (Bettman, Luce and Payne 1998; Johnson et al. 2012) and when evaluating past choices (Chernev, Böckenholt and Goodman 2015; Hsee and Leclerc 1998). The composition of options present in a choice set impacts the attractiveness of a given option (Huber, Payne and Puto 1982; Sela, Berger and Liu 2009; Simonson 1989) and whether a choice is made (Dhar 1997; Iyengar and Lepper 2000; Tversky and Shafir 1992). Likewise, the structure and composition of the choice set in a past choice impacts post-choice evaluations, such as satisfaction (Houston and Sherman 1995; Kim, Shin and Han 2014; Mogilner, Rudnick and Iyengar 2008).

Counterfactual consideration of foregone alternatives, in particular, has been theorized as influencing post-choice attitudes (Inman, Dyer, and Jia 1997). Normatively, characteristics of unchosen alternatives, including diversity among the alternatives, should not affect assessment of perceived loss, because it does not change the value of the second-best alternative, and thus, does not change the opportunity cost. However, when choosing one option from a choice set, people tend to feel as if they are foregoing *all* the other possible alternatives that were offered, not just foregoing the *one* next-best alternative that would have been chosen instead (Schwartz 2004).

For instance, when consumers make a choice and forego other options due to an external constraint (i.e., budget, time) the illusion that they could have utilized all of the foregone options inflates the perceived loss caused by the choice, leading them to perceive their choice as missing out on multiple options (Weiss and Kivetz 2019). By contrast, not considering foregone options

(i.e., experiencing choice-closure) increases consumers' satisfaction with their choice (Gu, Botti and Faro 2013). Thus, considering the alternative choices they could have made may influence individuals' evaluations about the current choice, with consequences for future persistence (Parker and Schrifft, 2011; Schrifft and Parker, 2014).

Building on these prior findings, we posit that which foregone alternatives people consider may affect how they evaluate their choice, with important motivational consequences. Specifically, we propose that the diversity of considered foregone alternatives is an important cue to how people perceive the impact of their choice on the process of goal-pursuit.

### ***Similar vs. dissimilar foregone alternatives***

Previous research has shown that variety affects consumer judgments in various domains, from quantity and numerosity judgments (Isaac and Brough 2014; Redden and Hoch 2009) to emotional judgments (Mogilner et al. 2008; Sagi and Friedland 2007). In particular, Sagi and Friedland (2007) showed that the more diverse the foregone alternatives are, the more regret people feel about their choice. For example, in one study, participants made a blind choice without knowing what the alternatives were, and all participants were informed they had chosen a \$50 bill. The participants who discovered that the unchosen alternatives were dissimilar items with few overlapping features (e.g., mini-stereo set and microwave oven) regretted their choice more than participants who found out the unchosen items were more similar to each other (e.g., mini-stereo set and videotape player/recorder). A similar finding is observed in a savings goal context. Spending money from two partitioned accounts induces more guilt than spending the same amount of money from a single, pooled account because it is perceived as two separate failures (Soman and Cheema 2011). Building on this prior work, we examine whether and how the variety of forgone alternatives boosts the positive impact of a past goal-consistent choice.

The prior literature has demonstrated that the degree and nature of shared vs. unique features of alternatives can systematically impact decision-making (see Sherman, Houston and Eddy 1999 for a review). For example, when evaluating alternatives, shared features among alternatives are underweighted whereas unique features receive greater attention (Dhar and Sherman 1996). Therefore, when people recall the foregone alternatives from a previous choice, if the alternatives are similar one another, with overlapping positive features, individuals may feel that what they have given up are interchangeable *units* of the same desirable attributes.

In our earlier example, having chosen the green apple over chocolate chip cookies, peanut butter cookies, and M&M cookies would be seen as having foregone merely cookies. However, when people instead consider having foregone dissimilar alternatives, they would pay attention to each of the distinct positive features associated with each alternative and feel they have given up multiple *types* of desirable attributes. Thus, having chosen the green apple would be seen as having foregone not only cookies, but also donuts and muffins. In other words, foregoing similar alternatives may be perceived as a single sacrifice of one type of consumption, whereas foregoing dissimilar alternatives may be perceived as having made multiple sacrifices of different types of consumption.

This difference in perceived sacrifice can, in turn, change perceptions about how much impact the past goal-consistent choice had on overall goal pursuit. Specifically, the perceived impact of foregoing similar alternatives would be seen as smaller than foregoing dissimilar alternatives. Consistent with the concept of diminishing sensitivity, the marginal impact of considering foregone options would decrease when it is perceived as foregoing multiple units of the same attribute, but not when perceived as foregoing different types of attributes. Therefore, even having made the same goal-consistent choice, which yields the same *objective* impact on

goal progress, greater variety among the past counterfactual alternatives that individuals have in mind would make them feel they had foregone more, giving up on different types of desirable attributes they could have enjoyed.

Consistent with this proposition, prior research has shown that consumers evaluate foregoing multiple food types, which we argue involves greater perceived sacrifice, as helping a weight-related health goal more than foregoing food quantity of single type, holding calorie consumption constant (Haws and Liu 2016). Similarly, the large literature on scope insensitivity (Hsee and Zhang 2010), particularly for affective stimuli (Hsee and Rottenstreich 2004), implies that consumers would be relatively insensitive to changes in the quantity of food, but perceive differences in food type as affecting their health goal more (Liu et al. 2018). Based on these findings, we posit that when people consider diverse (vs. similar) goal-inconsistent alternatives they have foregone, they would perceive having made greater sacrifice, which would also increase the subjective impact of the goal-consistent choice on overall goal progress.

### ***Subjective goal impact and subsequent motivation***

Accumulated progress toward a goal increases consumers' motivation in goal-pursuit. Initial research in animal behavior (Hull 1932; 1934; Miller 1944) and more recent research on human decision-making (Cheema and Bagchi 2011; Förster, Higgins and Idson 1998; Kivetz, Urminsky, & Zheng, 2006; Nunes and Drèze 2006) has demonstrated a goal gradient, such that motivation increases with proximity to a goal. In particular, Kivetz et al (2006) demonstrated that consumers invest more effort in goal pursuit (repurchasing coffee sooner, investing more effort and persisting longer in an evaluative task) with greater perceived progress towards the goal. Critically, they demonstrate that even cues signaling an illusion of goal progress (e.g., providing free loyalty program stamps while holding total requirements constant) boost motivation.

Recent research has focused on how differences in subjective consideration of goal progress influence motivation, such that consumers are more motivated to act when the action is seen as having a larger subjective impact on their goal pursuit. People assess their goal progress relative to reference points (Heath, Larrick and Wu 1999). During goal-pursuit, people are more motivated when their attention is directed to cues that make the marginal impact of their action appear relatively larger (Koo and Fishbach 2012). In contrast, people tend to lose their motivation when the perceived marginal impact becomes less salient. For instance, people show decreased motivation when they are midway through goal pursuit (i.e., “stuck in the middle”, Bonezzi, Brendl and De Angelis 2011) or as they move away from the initial state when pursuing a goal without a clear end-point (Wallace and Etkin 2017).

These findings suggest that when consumers perceive their prior goal-consistent action as having resulted in higher impact, they will be more motivated to maintain goal pursuit. Here, we propose the *foregone diversity effect*: even when two people make the same goal-consistent choice, differences in how they think of the foregone alternatives as dissimilar (vs. similar) yield more (vs. less) perceived impact of the choice on goal progress, increasing (vs. reducing) subsequent motivation. Notably, despite the importance of subjective impact on goal progress for consumers’ motivation, little is known about how consumers’ evaluations of foregone alternatives from past choices affects their goal-related perceptions and current motivation.

Next, we present five experimental studies that collectively test our entire conceptual framework. We first examine whether people who spontaneously consider diverse (vs. similar) foregone alternatives have higher motivation in savings goals, using recall of actual past choices (Study 1). We demonstrate that manipulating diversity among foregone alternatives in a scenario yields higher subjective impact on goal-pursuit (Study 2). Study 3 provides support for our

suggested mechanism: prompting people to recall more diverse foregone goal-inconsistent alternatives increases the perceived sacrifice and subjective impact of the past goal-consistent choice, resulting in a higher likelihood to make a subsequent goal-consistent choice. In study 4, we manipulate the perceived diversity of the same set of foregone alternatives, using categorization, and replicate the foregone diversity effect on goal persistence. Study 4 also shows a boundary condition, such that the increase in motivation due to higher subjective goal-impact is attenuated when the initial and subsequent choices jointly contribute to the same subgoal, instead of separately contributing to the superordinate goal-pursuit process. Finally, in study 5, we test the effect of considering diverse foregone options in a field setting, involving both a real initial goal-congruent action (gym exercise) and a consequential food choice. Across the studies, we find that considering more diverse forgone goal-inconsistent alternatives increases consumers' evaluations of the impact of their goal-consistent choice and increases the subsequent goal-consistent behavior. We rule out multiple alternative explanations involving changes in goal value and affective consequences of the past choice (e.g., choice satisfaction and choice difficulty).

### **STUDY 1: CONSIDERING DISSIMILAR FOREGONE ALTERNATIVES MOTIVATES GOAL-CONSISTENT CHOICES**

Our primary objective in study 1 was to test the basic effect of the diversity of foregone goal-inconsistent alternatives on motivation. Specifically, we expected participants would be more motivated to keep pursuing their goal and make a goal-consistent choice when they consider *diverse* goal-inconsistent alternatives they could have chosen in a past goal-consistent

choice than when they consider *similar* goal-inconsistent alternatives they have forgone. We employed saving (vs. spending) as a widely shared goal. In a pretest ( $N = 142$ , see Online Appendix A), 96% of people indicated they currently endorse saving as an active personal goal.

### ***Method***

We collected 286 valid completed surveys from participants in the United States (128 male,  $M_{\text{age}} = 39.61$ ) on Amazon Mechanical Turk (MTurk) (pre-registered at <https://osf.io/5y9wt>). In all the online studies we conducted, we excluded records with duplicate IP addresses or from participants who failed an attention check and didn't follow the instructions, prior to analysis. Full survey stimuli for all studies and all data will be made publicly available via OSF.

First, in order to confirm that participants actively endorsed the savings goal, we asked them to indicate the extent to which they agreed with the following statements on a 7-point scale (1 = *Strongly disagree*, 7 = *Strongly agree*): (1) "Saving money is very important to me"; (2) "I am highly conscious of how and where I spend my money"; (3) "I am highly active in my pursuits toward financial planning"; (4) "I try to save money, rather than spending it, as much as I can"; (5) "I try not to make impulse spending as much as I can."

Then, participants were asked to recall and briefly explain a recent experience in which they had been faced with a spending temptation involving a meaningful amount of money but had ultimately decided not to spend it. Participants wrote down how they had wanted to spend the money and the approximate amount of money they had decided not to spend (and to instead save). Next, they were asked to list two other ways they could have spent the same amount of money for themselves. In other words, all participants recalled their own goal-consistent choice

(*saving*) and considered three goal-inconsistent options (*spending*) they could have chosen instead.

Next, participants read a scenario regarding a shopping trip. They imagined they went to a mall with a specific budget. In the scenario, an item they had wanted to buy for a long time was on a sale, but was still beyond their planned budget. After reading the scenario, participants answered how likely they were to buy the item in the situation, using a 7-point scale (1 = *Never*, 7 = *Definitely*). They also indicated how much they would be willing to spend to buy the item, on a slider scale from \$0 to \$500 dollars.

Finally, we measured the perceived diversity of the goal-inconsistent alternatives that the participants had spontaneously considered prior to making the choice whether to spend money beyond their budget or not. They were presented with the spending alternatives they had listed in the first part of the survey, and indicated the extent to which they agreed with the following statements on a 7-point scale (1 = *Strongly disagree*, 7 = *Strongly agree*): (1) “Alternatives overlap in term of what needs they meet” (reverse-coded); (2) “All of the alternatives are more or less the same” (reverse-coded); (3) “I have foregone diverse kinds of alternatives”. Participants also reported the attractiveness of each spending option they had provided on a 7-point scale (1 = *Not at all*, 7 = *Very much*). For demographic information, they indicated their gender and age.

### **Results**

Consistent with the results of the pretest, the composite score of savings-goal importance ( $\alpha = .79$ ) revealed that participants considered saving to be an important and active goal ( $M = 5.97$  out of 7,  $SD = .76$ ), rating it significantly above the midpoint of the scale (4) on average ( $t(285) = 43.87, p < .001$ ).

To test our main hypothesis, we first computed a composite score ( $\alpha = .47$ ) reflecting the perceived diversity among the foregone alternatives that participants generated. Then we conducted regression analyses to predict participants' spending decision based on the diversity of the foregone options. As predicted, participants who perceived they had foregone more diverse options were less likely to spend money beyond their budget ( $b = -.30, t(284) = -3.36, p < .001$ ), acting in a way more consistent with their savings goal. The relationship between the foregone-alternative diversity and the subsequent motivation remained significant ( $b = -.28, t(282) = -3.04, p = .003$ ) controlling for the dollar amount saved ( $p = .72$ ) and the attractiveness of the foregone alternatives ( $p = .024$ ).

Further, the same regression analyses were conducted on the amount of the money participants intended to spend. The results again revealed the predicted effect of the foregone-option diversity on the spending amount ( $b = -10.88, t(284) = -2.10, p = .036$ ), showing that participants who viewed their foregone alternatives as more diverse indicated they would spend less money on the subsequent spending occasion. The effect was marginally significant when controlling for the dollar amount saved and the attractiveness of the foregone alternatives ( $b = -9.72, t(282) = -1.86, p = .064$ ).

### ***Discussion***

Study 1 provides initial evidence supporting our hypothesis that how people consider foregone options influences their subsequent motivation to pursue the focal goal subsequently. When people thought they had foregone dissimilar goal-inconsistent alternatives, they were more likely to make a goal-consistent decision subsequently than when they thought they had foregone a set of similar alternatives.

In the current study, participants generated alternatives to the past goal-consistent choice retrospectively, and merely perceiving more variety among the options afterwards predicted more motivation to keep pursuing the savings goal: less intention to spend at all, and a willingness to spend less money. These results suggest that even without actually rejecting goal-inconsistent alternatives at the moment of a choice, how past foregone alternatives are recalled can affect motivation and the likelihood of subsequent goal-consistent choices.

## **STUDY 2: CONSIDERING DISSIMILAR ALTERNATIVES INCREASES SUBJECTIVE IMPACT OF A GOAL-CONSISTENT CHOICE**

Study 2 was conducted to investigate the mechanism underlying the effect of past alternative diversity on motivation and choice that we found in Study 1. Our theory suggests that when consumers think they have foregone dissimilar (vs. similar) goal-inconsistent alternatives to make a goal-consistent choice, resisting different types (vs. the same type) of temptations, they will feel that they have made a larger impact on their goal pursuit. However, the results of Study 1 could also be explained by people with stronger chronic savings goal motivation being more likely to recall diverse spending options.

The current study tests the causal effect by instead manipulating the diversity of the foregone alternatives to a prior choice. Participants were provided with a set of either diverse or similar alternatives in the same healthy food choice scenario. This study employs a different goal, weight-loss, to further generalize our findings.

Our pretest showed that a weight-loss goal, unlike the savings goal we employed in Study 1, is not a universal goal among population (62% indicated endorsing weight-loss as an active

personal goal). Past research has shown that subjective goal importance moderates various goal-related perceptions and behaviors (i.e., people exert more self-control, leading to greater performance [Latham, Erez and Locke 1988; Locke and Latham 2002; Sue-Chan and Ong 2002]; people are more likely to keep pursuing the goal after an initial goal-consistent activity [Zhang et al. 2010]; the goal is more likely to be activated by temptations [Fishbach, Friedman and Kruglanski 2003]).

More importantly, when a goal is personally important, people are more motivated to process information, amplifying the impact of contextual and peripheral cues. For example, people who had weight-loss goals were more sensitive to contextual cues in duration information (Ülkümen and Thomas 2013). In addition, when evaluating personally relevant tasks that involved self-regulation, consumers tended to focus on and simulate process (e.g., the process of avoiding unhealthy foods) more than outcome (e.g., the end benefits of achieving ideal body mass index). Based on these findings, goal importance may be a necessary pre-condition for the diversity of foregone alternatives to impact subsequent motivation and choice. Specifically, people who endorse the weight-loss goal and perceive it as personally more important may therefore be more likely to focus on contextual information, such as the foregone alternatives. Thus, considering a diverse set of foregone goal-inconsistent alternatives would enhance the subjective impact of a prior goal-congruent choice primarily among consumers who see the focal goal as important.

### ***Method***

We collected 468 completed surveys from MTurk participants in the United States (248 male,  $M_{\text{age}} = 39.03$ ). This study manipulated foregone-option diversity (similar or dissimilar) between-subjects. The study consisted of three phases: diversity evaluation and goal impact

evaluation counterbalanced, and weight-loss goal importance measured last. We found no significant differences based on order, and present results collapsed over the two orders.

In the diversity evaluation phase, to provide an anchor for the diversity perception among alternatives, participants in all conditions were presented with eight sets of three different snacks. Participants rated how similar or dissimilar the snack items shown in a set were, using a 7-point scale (1 = *Absolutely dissimilar*, 7 = *Absolutely similar*).

Participants were then asked to imagine that they were currently on a diet and presented with a set consisting of one goal-consistent option and three goal-inconsistent alternatives. In the scenario, they had chosen the goal-consistent option, baked apple chips, instead of one of the three other (high-calorie) foregone alternatives. In the similar alternatives condition, all three foregone options were the same kind of snack (either all donuts, all cupcakes or all chips, randomly assigned) but with different flavors (e.g., glazed, chocolate iced custard and powdered raspberry donuts). By contrast, in the dissimilar alternatives condition, the choice set consisted of three different kinds of snacks (a donut, a cupcake and a bag of chips). Each item appeared in exactly one similar alternatives set and one dissimilar alternatives set, so as to equalize the items, on average, across the conditions.

As a manipulation check, participants rated how similar the three foregone options were to one another on the same 7-point scale they used in the diversity evaluation phase. Then, as the main DV, participants rated how much of (1) an achievement, (2) contribution, or (3) progress they think their choice made towards their weight-loss goal (1 = *None*, 7 = *A lot*). These three measures were averaged into a subjective goal-impact score. To test for affect as a potential confound on how people interpret goal-related choice (Fishbach, Eyal and Finkelstein 2010), we also measured how satisfied participants would feel with the decision, how good they would feel

about themselves, and how much difficulty they would feel when making the decision on a 7-point scale (1 = *Not at all*, 7 = *Very much*).

Next, after an unrelated filler task, participants rated the attractiveness of the nine snack items used in the study, and completed a slightly modified Concern for Dieting subscale of the Restraint Scale (RS; Herman & Polivy, 1975). Sample items included “Would a weight fluctuation of 5lbs affect the way you live your life?” (1 = *Not at all*, 4 = *Very much*) and “How conscious are you of what you are eating?” (1 = *Not at all*, 4 = *Extremely*). In addition to four items of the Concern for Dieting subscale, participants also rated how likely they were to consciously eat low calorie foods using a 4-point scale (1 = *Very unlikely*, 4 = *Very likely*). We averaged the measures to create a composite score reflecting the personal importance of weight-loss goals. Finally, participants indicated their height and weight, to enable us to calculate BMI, as well as gender and age.

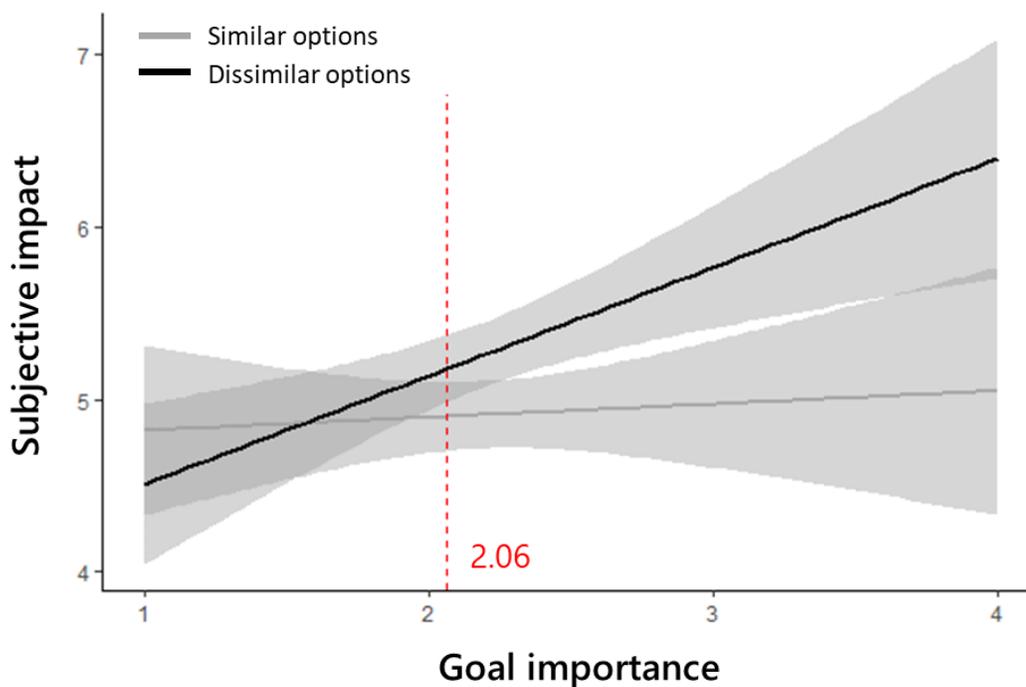
### ***Results***

As intended, participants perceived the foregone alternative sets comprised of the different kinds of snacks [dissimilar condition] as being more diverse than the sets comprised of different flavors of the same kind of snack [similar condition] ( $M_{\text{similar}} = 3.35$ ,  $M_{\text{dissimilar}} = 5.28$ ,  $F(1, 464) = 145.15$ ,  $p < .001$ ).

To test the effect of foregone option on subjective goal-impact, we conducted an ANOVA using the foregone-option diversity condition and measured goal importance as independent variables, predicting the subjective goal-impact score. We found significant main effects of foregone-option diversity ( $M_{\text{similar}} = 4.99$ ,  $M_{\text{dissimilar}} = 5.25$ ,  $F(1, 464) = 6.08$ ,  $p = .014$ ) and goal importance ( $M = 2.18$ ,  $SD = .51$ ;  $F(1, 464) = 7.06$ ,  $p = .008$ ). We also found a significant interaction between diversity of foregone alternatives and goal importance ( $F(1, 464)$

= 4.23,  $p = .039$ ; see Figure 1). The two main effects and the interaction between foregone-option diversity and goal importance on the perceived impact remained significant even after controlling for participants' BMI, the counterbalanced order of the diversity evaluation phase, and four additional covariates (choice satisfaction, feeling good about oneself, decision difficulty, and averaged attractiveness of alternatives; main effect of option diversity:  $F(1, 458) = 13.40, p < .001$ ; main effect of goal importance:  $F(1, 458) = 15.55, p < .001$ ; interaction:  $F(1, 458) = 9.41, p = .002$ ).

Figure 1: THE EFFECT OF FOREGONE-OPTION DIVERSITY AND GOAL IMPORTANCE ON SUBJECTIVE IMPACT



We conducted a floodlight analysis to identify the range of goal importance values for which the foregone-option diversity manipulation significantly increases the subjective goal-impact (Johnson and Neyman 1936; Spiller et al. 2013). The Johnson–Neyman point at  $p < .05$

for the goal importance moderator was 2.06 (on the 4-point scale). For the 58% of participants whose weight-loss goal importance score was 2.06 out of 4 or higher, choosing a healthy option over a set of dissimilar unhealthy alternatives (rather than over a set of similar unhealthy alternatives) was perceived as having made a significantly greater impact on the focal goal. Conversely, among those who were not actively pursuing a weight-loss goal (below 2.06 on the weight-loss goal importance scale), the similarity or dissimilarity of the foregone alternatives did not significantly affect the perceived impact of the goal-consistent choice.

### *Discussion*

The findings in Study 2 corroborate our proposition that considering dissimilar foregone alternatives increases the perceived impact of a goal-consistent choice on overall goal pursuit, especially among people who are actively pursuing the focal goal. When people thought about having foregone dissimilar goal-inconsistent alternatives that they could have enjoyed, they felt their choice had made a greater impact on their focal goal than when they thought about having foregone a set of similar alternatives.

We have also replicated the observed effect of foregone-option diversity on subjective goal-impact in a savings context (see Online Appendix B), manipulating the foregone-option diversity of recalled spending alternatives. Participants prompted to recall a more diverse set of foregone spending options perceived more impact of their initial choice to save instead of spend, on their savings goal-pursuit.

Our conceptual framework proposes that people will perceive having foregone diverse (vs. similar) alternatives as having made multiple sacrifices when choosing a goal-consistent option, increasing the subjective impact of the past choice on overall goal pursuit. Higher subjective impact would then increase the motivation to persist and to make subsequent goal-

consistent choices. In our next study, we directly test the hypothesized role of perceived sacrifice and subjective impact on a subsequent choice.

### **STUDY 3: PERCEIVED SACRIFICE DRIVES THE EFFECT OF FOREGONE-OPTION DIVERSITY ON SUBSEQUENT MOTIVATION**

Study 3 was conducted to test perceived sacrifice and subjective impact as the underlying processes by which foregone-option diversity affects subsequent motivation. We predicted that people who consider having previously passed over dissimilar (vs. similar) goal-inconsistent alternatives in favor of a goal-consistent option would 1) perceive that they have made a greater sacrifice to follow the goal, 2) see their goal-consistent choice as having more impact on overall goal progress, and, 3) be more motivated to persist in goal pursuit and to make subsequent goal-consistent choices, as a result.

In addition, because our framework suggests that the effect of foregone-option diversity occurs when greater perceived sacrifice for a goal increases subjective goal-impact, we predict that foregone-option diversity would not have an effect when the alternatives considered are goal-inconsistent. Because goal-consistent alternatives don't involve as much of a tradeoff (Dhar and Wertenbroch 2012), considering these alternatives would not prompt a sense of having sacrificed to stick to the goal, and the diversity of foregone *goal-consistent* alternatives will not affect subjective goal-impact or subsequent goal-related choices.

Study 3 employed healthy eating as another widely shared food goal, in place of the narrower goal of weight-loss used in study 2. A pretest results confirmed that 89% of people (126 out of 142) were pursuing healthy eating as an active goal.

## **Method**

We collected 457 valid complete surveys from Mturk participants in the United States (206 male,  $M_{\text{age}} = 40.04$ ). This study employed a 2 (diversity: similar or dissimilar)  $\times$  2 (goal-consistent vs. goal-inconsistent alternatives) between-subjects design (pre-registered at <https://osf.io/5y9wt>).

First, to confirm the importance of the healthy eating goal among participants, we asked them to indicate the extent to which they agreed with the following statements on a 7-point scale (1 = *Strongly disagree*, 7 = *Strongly agree*): (1) “I am highly conscious of what I am eating,” (2) “I try to eat healthy as much as I can.”

Next, participants read a short description of what “healthy diet” means (e.g., high consumption of plant-based foods, low consumptions of animal-based foods, and low consumption of sugar). Then, we asked participants to recall and write about a recent experience when they had made a healthy food choice that met at least one of the criteria stated above. Depending on the condition, participants then generated either three similar or three dissimilar unhealthy [goal-inconsistent condition] or healthy [goal-consistent condition] alternatives they could have chosen, instead of the healthy food that they did choose. After describing how the three alternatives were similar or dissimilar to one another, participants rated how much of (1) an achievement, (2) impact, and (3) progress they think their goal-consistent choice made towards their health goal (1 = *None*, 7 = *A great deal*). They also indicated the perceived sacrifice by answering the following questions on a 7-point scale (1 = *None*, 7 = *A great deal*): (1) How much sacrifice do you think you made, (2) How much enjoyment do you think you gave up, and (3) How much temptation do you think you overcome when you chose the healthy meal instead of the other options?

We also tested an alternative explanation, that considering having foregone diverse (vs. similar) alternatives might have acted as a self-signal, changing the perception of oneself as having self-control and being committed to the healthy eating goal. To test this, we collected the following measures: (1) “In general, I am good at controlling myself to pursue a health goal,” (2) “In general, I am the type of person who indulges when it comes to food” (reverse-coded), (3) “In general, “eating healthy” is an important value to me” (1 = *Strongly disagree*, 7 = *Strongly agree*).

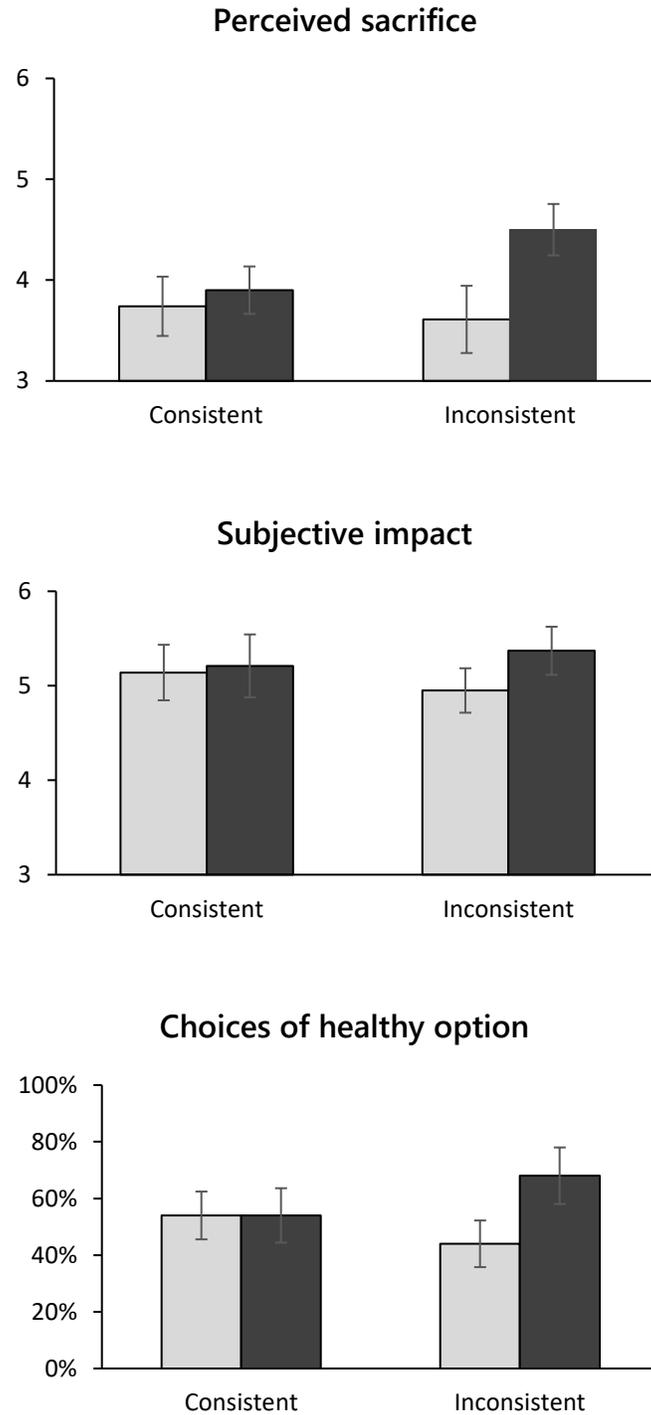
Participants then were told that once the data collection was finished, the research team would randomly select participants of the survey and send them an e-voucher for a box of KIND bars. The participants indicated which flavor (“Wholesome mix of healthiness: KIND almond, walnut & macadamia” vs. “Sweet and salty indulgence: KIND dark chocolate & peanut butter”) they would like to receive if they are selected. Based on a pre-test (Online Appendix D), the energy bars were perceived as healthy and congruent with pursuing a health goal.

Finally, participants rated the attractiveness of each food option they had generated earlier and reported their gender and age for demographic information.

## **Results**

As expected, and confirming our pretest result, the composite score of healthy eating goal importance ( $\alpha = .80$ ) revealed that, on average, participants were pursuing eating healthy as an important and active goal ( $M = 5.37$ ,  $SD = 1.23$ ;  $t(456) = 23.89$ ,  $p < .001$ , compared with the midpoint of the scale (4)).

Figure 2: THE EFFECT OF FOREGONE-OPTION DIVERSITY ON PERCEIVED SACRIFICE, SUBJECTIVE IMPACT, AND SUBSEQUENT CHOICE



Note: Error bars depict 95% Confidence Intervals.

*Perceived sacrifice.* We tested our hypothesis that considering dissimilar alternatives (instead of similar alternatives) increases the perceived sacrifice, but only when the foregone alternatives are inconsistent with the focal goal. A 2 (diversity: similar or dissimilar)  $\times$  2 (goal-consistent vs. goal-inconsistent alternatives) ANOVA was conducted on the composite score of perceived sacrifice ( $\alpha = .84$ ). Results showed a significant interaction ( $F(1, 453) = 6.30, p = .012$ ), as well as main effects of foregone-option diversity ( $F(1, 453) = 3.82, p = .051$ ) and goal-consistency of the alternatives ( $F(1, 453) = 12.92, p < .001$ ). In particular, the main effect of goal-consistency of the alternatives confirms that people perceive their choice as a sacrifice specifically when they have given up goal-inconsistent alternatives ( $M = 4.19, SD = 1.46$ ), but not after giving up goal-consistent alternatives ( $M = 3.68, SD = 1.63$ ). These effects remained significant after controlling for the self-perception measure ( $\alpha = .73$ ) and the averaged attractiveness rating of the provided foregone alternatives (interaction:  $F(1, 451) = 5.80, p = .016$ ; option diversity:  $F(1, 451) = 3.90, p = .049$ ; goal-consistency:  $F(1, 451) = 13.20, p < .001$ ).

Importantly, confirming our prediction, planned contrasts revealed that when participants considered unhealthy (goal-inconsistent) alternatives they had foregone, they reported greater sacrifice when thinking about dissimilar alternatives than when thinking about similar alternatives ( $M_{\text{dissimilar}} = 4.50, SD_{\text{dissimilar}} = 1.43, M_{\text{similar}} = 3.90, SD_{\text{similar}} = 1.43; b = .58, t(451) = 4.58, p = .002$ ). However, as predicted, when participants considered healthy (goal-consistent) alternatives, the diversity of the considered alternatives did not affect the consistently lower level of perceived sacrifice ( $M_{\text{dissimilar}} = 3.61, SD_{\text{dissimilar}} = 1.70, M_{\text{similar}} = 3.74, SD_{\text{similar}} = 1.57; b = -.11, t(451) = -.51, p = .614$ ).

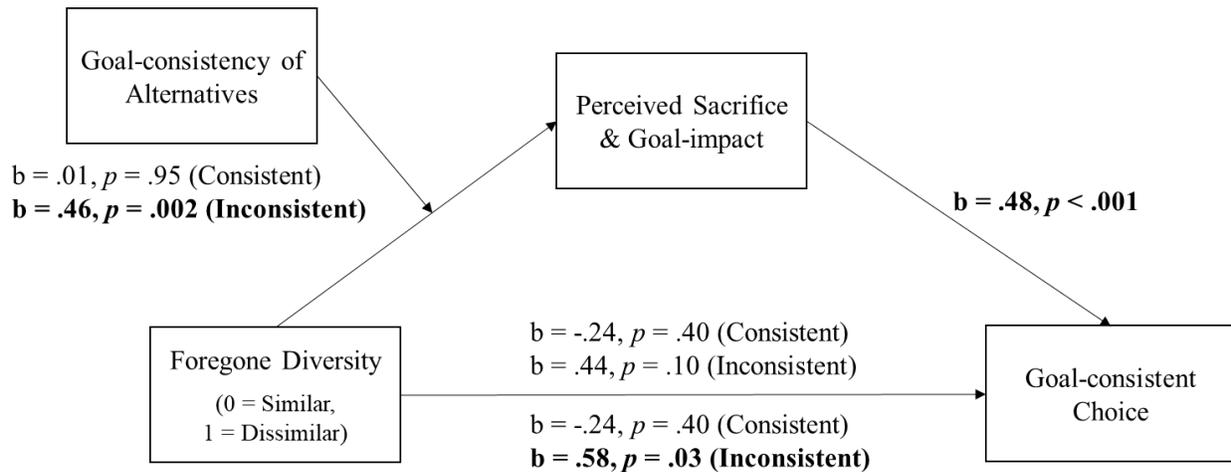
*Subjective impact.* We then examined whether the diversity of the foregone options increases the subjective impact of the goal-consistent choice, in particular, when goal-inconsistent alternatives are considered. The same  $2 \times 2$  ANOVA on the subjective impact revealed a significant main effect of foregone-option diversity ( $F(1, 453) = 4.42, p = .036; F(1, 451) = 5.59, p = .012$  when including controlling variables). Replicating our previous findings, participants who considered unhealthy (goal-inconsistent) alternatives felt they had achieved greater impact on their healthy eating goal when considering dissimilar alternatives compared to similar alternatives ( $M_{\text{dissimilar}} = 5.27, SD_{\text{dissimilar}} = 1.30, M_{\text{similar}} = 4.95, SD_{\text{similar}} = 1.42; b = .37, t(451) = 2.48, p = .014$ ). In contrast, when participants considered which healthy (goal-consistent) alternatives they could have chosen instead, there was no difference between the similar vs. dissimilar condition ( $M_{\text{dissimilar}} = 5.14, SD_{\text{dissimilar}} = 1.30, M_{\text{similar}} = 5.21, SD_{\text{similar}} = 1.35; b = .12, t(451) = .73, p = .468$ ).

*Self-perception measure.* The same  $2 \times 2$  ANOVA was conducted on the composite score of self-perception measures ( $\alpha = .72$ ) to rule out the alternative mechanism of self-perception account. No significant effect was found (all  $p$ 's  $> .51$ ), except a marginal main effect of goal-consistency of alternatives ( $M_{\text{inconsistent}} = 4.90, SD_{\text{inconsistent}} = .74, M_{\text{consistent}} = 4.79, SD_{\text{consistent}} = .78; F(1, 453) = 2.75, p = .098$ ).

*Subsequent choice.* A logistic regression analysis on the subsequent choice revealed a significant interaction between foregone-option diversity and goal-consistency of the options ( $b = .81, p = .034$ ). Supporting our predictions, in the goal-inconsistent conditions, in which participants thought about unhealthy alternatives they had foregone, considering dissimilar unhealthy alternatives to a prior healthy choice yielded more choices of a healthy meal, compared to considering similar unhealthy alternatives (68% vs. 54%,  $\chi^2 = 4.43, p = .035$ ).

However, the diversity of foregone alternatives had no effect when participants instead considered healthy, goal-consistent alternatives (48% vs. 54% chose the healthy option,  $\chi^2 = .48$ ,  $p = .487$ ). The interaction between foregone-alternative diversity and goal-consistency of the alternatives remained significant after controlling for the self-perception measures and the attractiveness ratings of the alternatives ( $b = .79$ ,  $p = .044$ ).

Figure 3: MODERATED MEDIATION MODEL



*Mediation analyses.* We conducted mediation analyses to test our proposed framework that diversity of forgone goal-inconsistent options heightens perceived sacrifice and subjective impact of the goal-consistent choice, leading to greater motivation to make further goal-consistent choices (see Figure 3). Supporting our framework, a set of mediation models (PROCESS, Model 4, Preacher and Hayes 2004) confirmed that the perceived sacrifice and subjective impact mediated the effect of diversity of foregone *goal-inconsistent, unhealthy* alternatives in a prior choice on preference for the healthy option in the current choice (indirect effects: perceived sacrifice  $b = .1406$ ,  $se = .0703$ ,  $CI = [.0269, .2997]$ ; subjective impact  $b = .0951$ ,  $se = .0566$ ,  $CI = [.0067, .2244]$ ). However, when considering goal-consistent, healthy foregone options, the perceived sacrifice and subjective impact did not mediate the relationship between foregone-option diversity and the current food choice (perceived sacrifice:  $b = .0116$ ,  $se = .0314$ ,  $CI = [-.0459, .0868]$ ; subjective impact:  $b = .0209$ ,  $se = .0602$ ,  $CI = [-.1001, .1495]$ ).

As the perceived sacrifice and subjective impact had a strong correlation ( $r = .44$ , overall  $\alpha = .82$ ), we combined the two measures into a single index and conducted a moderated mediation analysis (PROCESS, Model 8) using the index as the mediator, foregone-option diversity as the independent variable, goal-consistency of the past-choice alternatives as the moderator, and current food choice as the dependent variable. The analysis again confirmed that the conditional indirect effect of the interaction between foregone-option diversity and goal-consistency on choice through the perceived sacrifice and subjective impact is significant ( $b = -.1248$ ,  $se = .0702$ ,  $CI = [-.2859, -.0134]$ ). The indirect effect was significant only when the foregone alternatives were goal-inconsistent ( $b = .1183$ ,  $se = .0555$ ,  $CI = [.0271, .2434]$ ), but not when goal-consistent ( $b = -.0065$ ,  $se = .0417$ ,  $CI = [-.0912, .0804]$ ).

## ***Discussion***

The process findings in Study 3 provide evidence supporting our theory of how foregone-option diversity impacts goal persistence. Study 3 confirmed that thinking about dissimilar (vs. similar) foregone goal-inconsistent alternatives increases people's perception of their sacrifice when making a prior goal-consistent choice and the impact their choice had on goal pursuit. The current study further demonstrated that this effect of foregone alternatives on perceived sacrifice and subjective goal impact in turn leads people to make more goal-consistent choices in a subsequent decision.

Further supporting the theory, we confirm a theory-based moderator. The effect of foregone-option diversity was observed only when participants considered having foregone goal-*inconsistent* alternatives that could have hindered goal progress. When they instead considered foregone goal-*consistent* alternatives, they perceived little sacrifice regardless of the diversity of alternatives, and the diversity of the foregone alternatives did not significantly impact perceived goal-impact or subsequent goal-related choices. Furthermore, the current study ruled out an alternative self-perception account, in which considering foregone diverse goal-inconsistent alternatives might signal higher self-control and goal commitment.

#### **STUDY 4: MANIPULATING THE PERCEIVED DIVERSITY OF ALTERNATIVES**

Study 4 had two objectives. First, we tested the foregone diversity effect by manipulating perceived diversity, holding the foregone alternatives constant across conditions. Previous findings suggest that splitting options into more categories signals greater variety among the available alternatives (Mogilner et al. 2008). We predicted that presenting the foregone goal-inconsistent alternatives as in different categories (e.g., presenting a goal-consistent category and

three different goal-inconsistent categories) would signal greater diversity than presenting the goal-inconsistent alternatives as all in the same category, resulting in more goal-consistent choices. For exploratory purposes, we also included an uncategorized condition as a control.

Second, we tested a theory-derived moderator, the salience of the superordinate goal that links sequential choices over time. Previous work on goal pursuit with subgoals has suggested focus on a salient narrower subgoal may detract from the superordinate goal (Kruglanski et al. 2002). When a superordinate goal is activated, initial progress in a subgoal leads individuals to continue goal pursuit, by working towards another subgoal congruent with the superordinate goal. By contrast, when a superordinate goal is not activated, initial progress in a subgoal results in less motivation to pursue another congruent subgoal (Fishbach, Dhar and Zhang 2006).

Our studies so far have shown that motivation increases when consumers feel their past goal-consistent choice had more impact on their continuous process of goal-pursuit, which presumes that the sequential choices are viewed as being linked to a common, broad superordinate goal. Importantly, in all the studies thus far the prior choice was clearly in the past and was temporally separated from the current choice (e.g., occurring on different days).

However, we propose that when consumers construe the choices more narrowly, with both the prior and current choice contributing to the same subgoal (e.g., meeting a daily goal), the motivational impact of goal-impact on the less salient superordinate goal would be reduced. We operationalize this by reducing temporal separation between the past and current goal-relevant choice. Specifically, we propose that higher subjective goal-impact of the initial goal-consistent choice would increase subsequent motivation when people make a subsequent choice on a separate day, and therefore, when a superordinate goal that links the initial and subsequent

choice is relatively salient. However, this effect would be reduced when the both choices are in the same day and contribute to the same daily subgoal.

### ***Method***

We collected 484 valid complete surveys from Mturk participants in the United States (229 male,  $M_{\text{age}} = 39.21$ ). This study employed a 3 (uncategorized vs. 2 categories vs. 4 categories)  $\times$  2 (same vs. next-day decisions) between-subjects design.

Participants were presented with a playlist consisting of 12 different videos (See Online Appendix E). They imagined they had recently set a long-term exercise goal and had chosen a home workout video to do. We manipulated the perceived diversity by categorization. In the 2 categories condition, the videos were categorized as either home workouts (goal-consistent) or entertainment (goal-inconsistent). However, in the 4 categories condition, the same twelve videos were more narrowly categorized into four groups: home workouts, Netflix series, 2020 Oscar winners, and musicals. In the uncategorized condition, the same videos were displayed without any categorization. Then, participants answered the same three-item measures of perceived sacrifice ( $\alpha = .79$ ) and subjective impact ( $\alpha = .92$ ) used in Study 3.

Next, participants made a subsequent goal-related choice between a shorter (20-minute) vs. longer (30-minute) home workout video. To manipulate the temporal separation between the past and present choice, participants were told that they usually do “one upper body circuit and one lower body circuit in one day” in the same-day condition or “an upper body circuit one day and a lower body circuit on the next day” in the next-day condition. Participants were also told that they were going to do a lower body circuit “next, to complete today’s workout goal” in the same-day condition or “tomorrow, to follow their exercise goal” in the next-day condition.

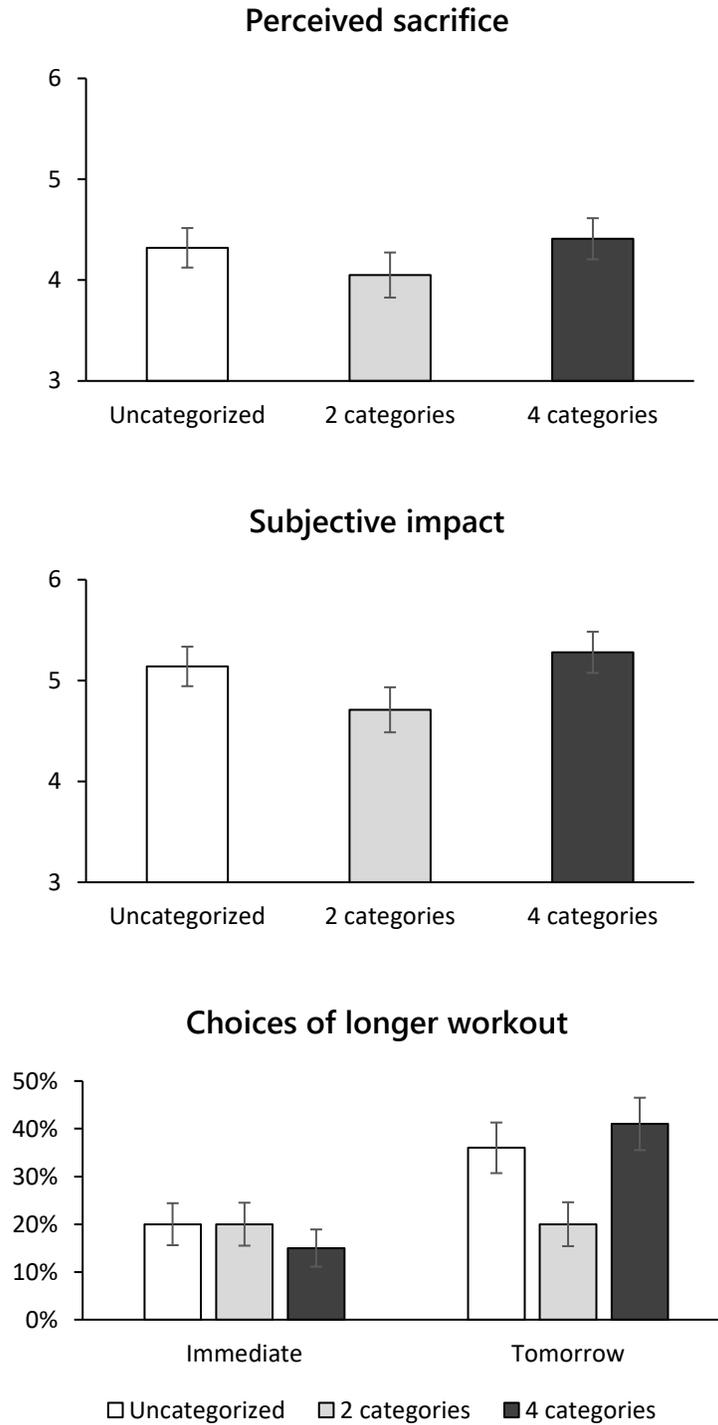
After making the choice, as a manipulation check, participants indicated the perceived variety of the presented alternatives: (1) “How much variety do you think there was in the playlist?” (1 = *Very little variety*, 7 = *A lot of variety*), (2) How similar were the videos to each other?” (reverse-coded), (3) How different were the videos from each other?” (1 = *Not at all*, 7 = *Extremely*). They also rated the attractiveness of each video and reported gender and age for demographic information.

### **Results**

As expected, the composite score of perceived diversity ( $\alpha = .68$ ) revealed that participants perceived the alternatives presented as 4 categories as more diverse than the same set of alternatives presented as 2 categories ( $M_{4\text{ cat}} = 5.11$ ,  $SD_{4\text{ cat}} = 1.00$ ,  $M_{2\text{ cat}} = 4.56$ ,  $SD_{2\text{ cat}} = 1.23$ ;  $t(315) = 4.35$ ,  $p < .001$ ). The level of perceived diversity in the uncategorized condition was greater than in the 2 categories condition ( $M_{\text{uncat}} = 4.98$ ,  $SD_{\text{uncat}} = 1.03$ ;  $t(319) = 3.34$ ,  $p < .001$ ), but not different from the 4 categories condition ( $p = .27$ ). We first present the planned comparisons between the 2 category (similar) and 4 category (dissimilar) conditions, and then exploratory contrasts involving the uncategorized condition.

*Perceived sacrifice.* Replicating Study 3, participants in the 4 categories condition, who perceived greater diversity among the foregone alternatives, reported higher sacrifice from choosing the goal-congruent workout video than those in the 2 categories condition ( $M_{4\text{ cat}} = 4.41$ ,  $SD_{4\text{ cat}} = 1.33$ ,  $M_{2\text{ cat}} = 4.05$ ,  $SD_{2\text{ cat}} = 1.42$ ;  $t(315) = 2.32$ ,  $p = .021$ ). Participants in the uncategorized condition reported marginally greater perceived sacrifice than those in the 2 categories condition ( $M_{\text{uncat}} = 4.32$ ,  $SD_{\text{uncat}} = 1.30$ ;  $t(319) = 1.78$ ,  $p = .076$ ), but no difference from the 4 categories condition ( $p = .54$ ).

Figure 4: THE EFFECT OF FOREGONE-OPTION DIVERSITY MANIPULATED BY CATEGORIZATION



Note: Error bars depict 95% Confidence Intervals.

*Subjective impact.* Replicating our previous results, subjective goal-impact in the 4 categories condition was greater than in the 2 categories condition ( $M_{4\text{ cat}} = 5.28$ ,  $SD_{4\text{ cat}} = 1.22$ ,  $M_{2\text{ cat}} = 4.71$ ,  $SD_{2\text{ cat}} = 1.38$ ;  $t(315) = 3.88$ ,  $p < .001$ ). Consistent with the differences across conditions in perceived diversity and sacrifice, subjective impact in the uncategorized condition was greater than in the 2 categories condition ( $M_{\text{uncat}} = 5.14$ ,  $SD_{\text{uncat}} = 1.29$ ;  $t(319) = 2.87$ ,  $p = .004$ ), while the uncategorized and 4 categories conditions did not significantly differ ( $p = .32$ ).

*Subsequent choice.* A logistic regression analysis on the subsequent workout choice revealed a significant interaction between categories (2 vs. 4) and choice occasion (same vs. next day) ( $b = 1.40$ ,  $se = .56$ ,  $Wald = 6.36$ ,  $p = .012$ ). In the next day condition, having foregone 3 different categories of goal-inconsistent alternatives yielded a higher likelihood of choosing the longer workout program for tomorrow's workout (41%), compared to having foregone the same alternatives grouped in a single category (20%,  $\chi^2 = 6.92$ ,  $p = .008$ ). However, the categorization manipulation had no effect on choices of which workout video to do today, to complete the daily goal (20% vs. 15%,  $\chi^2 = .61$ ,  $p = .434$ ). In line with the differences in perception measures, participants in the uncategorized condition were more likely to choose the longer workout program than those in the 2 categories condition when they made a choice for the next day (36% vs. 20%,  $\chi^2 = 4.08$ ,  $p = .043$ ), but there was no difference in goal-completing choices for the same day ( $p = 1$ ).

*Mediation analyses.* We conducted mediation analyses separately for the same-day and next-day conditions to test whether perceived sacrifice and subjective impact mediated the effect of categorization on the goal persistence for the next day (but not for the same-day boundary condition) (see Online Appendix F). A set of mediation models (PROCESS, Model 4) revealed significant mediations of perceived sacrifice and subjective impact on the goal persistence, when

making a choice for the next day (indirect effects: perceived sacrifice  $b = .2173$ ,  $se = .1391$ ,  $CI = [0190, .5533]$ ; subjective impact  $b = .2035$ ,  $se = .1263$ ,  $CI = [.0049, .4946]$ ). However, when making a choice within the same day, no significant indirect effect was observed (perceived sacrifice:  $b = .0080$ ,  $se = .0495$ ,  $CI = [-.0894, .1278]$ ; subjective impact:  $b = .0893$ ,  $se = .0956$ ,  $CI = [-.0370, .3292]$ ).

A moderated mediation analysis (PROCESS, Model 15) with a single index mediator (combining perceived sacrifice and subjective impact;  $r = .40$  and  $\alpha = .79$ ) confirmed a significant indirect effect ( $b = .2980$ ,  $se = .1604$ ,  $CI = [.0350, .6656]$ ). The indirect effect was significant only when making a choice for a separate day ( $b = .2857$ ,  $se = .1307$ ,  $CI = [.0822, .5997]$ ), but not when making a choice for the same day ( $b = -.0123$ ,  $se = .0985$ ,  $CI = [-.2072, .1889]$ ).

### ***Discussion***

Study 4 replicated the foregone diversity effect on goal persistence. In our prior studies, participants considered different sets of foregone alternatives depending on the condition (i.e., being presented with a different set of alternatives in study 2 or recalling similar or dissimilar alternatives in study 3). However, the current study replicates our findings while manipulating perceptions of similarity for the *same* set of alternatives, using categorization. The current findings suggest that the effect of perceived diversity of foregone alternatives is quite robust, and cannot be explained by confounding differences between the diverse and similar sets of alternatives.

Moreover, findings in the exploratory, uncategorized condition further corroborate our theory. When foregone alternatives were displayed without categorization, participants perceived

greater diversity among the alternatives compared to when the foregone alternatives were grouped into one single category, and therefore, people felt they made more of a sacrifice and had more impact on their goal pursuit, which led more goal-consistent choices. A supplemental study, involving only the 2 vs. 4 categories condition, without the uncategorized condition, replicated the observed effect (see Online Appendix G).

Lastly, this study suggests that the positive motivational effect of foregone-option diversity is bounded to when making a separate decision for the separate steps in the overall goal-pursuit process. When making a subsequent choice in the same step (i.e., as part of the same daily goal), after participants had already made a goal-consistent choice that achieved progress on the daily goal, people consistently preferred to invest less effort towards the goal regardless of the foregone alternatives, and the motivating effect of considering dissimilar alternatives was mitigated.

## **STUDY 5: HARNESSING DIVERSE FOREGONE ALTERNATIVES IN THE FIELD**

In Study 5, we aimed to test the effect of considering dissimilar alternatives in a natural setting, at a school gym, where people have spontaneously made an actual initial goal-consistent choice, to exercise. In this study, we tested whether the effect of foregone alternatives on subjective goal-impact of the initial choice influences a subsequent real consequential choice. In particular, we investigated whether the effect of considering diverse foregone alternatives in one domain (exercise) spills over to subsequent choices in a distinct domain (food) that may share a superordinate goal (health). In this case, although we test the influence of a prior choices on a subsequent choice within the same day, our framework suggests that the domain-based

separation between the choices (exercise vs. food) will focus people on the superordinate goal (i.e., instead of only on a narrower daily exercise or healthy eating goal), and we will replicate the foregone diversity effect.

The current study included a control condition in which people did not consider any alternative activities they could have done instead of exercising, as an additional control condition. This was included to test the proposition that considering dissimilar options enhances perceived impact of initial choice on goal progress, as opposed to consideration of similar options reducing people's perceived impact of their choice.

### ***Method***

We recruited 234 participants (121 male,  $M_{\text{age}} = 24.51$ ) who were leaving the gym on the campus of a large Midwestern university after exercising. Prior to analysis, we excluded 24 participants who were at the gym for pre-scheduled activities (taking physical education classes or training for varsity teams), and whose decision to go to the gym therefore reflected a long-standing commitment, rather than a specific discretionary choice. After this exclusion, we had 210 participants for analysis. This study employed a between-subjects design with three foregone-alternatives conditions (considering similar alternatives vs. dissimilar alternatives vs. no-alternatives control).

In the foregone-alternative conditions, participants first wrote down one activity they could have done instead of exercising. On the next page, they were asked to write down two other ways they could have spent their time, instead of exercising, either very similar to the first or very dissimilar. Participants then explained why the three ways of spending their time were either similar or dissimilar to each other, depending on the condition. Then, on the next page, using the same three subjective impact measures used in the previous studies, they evaluated

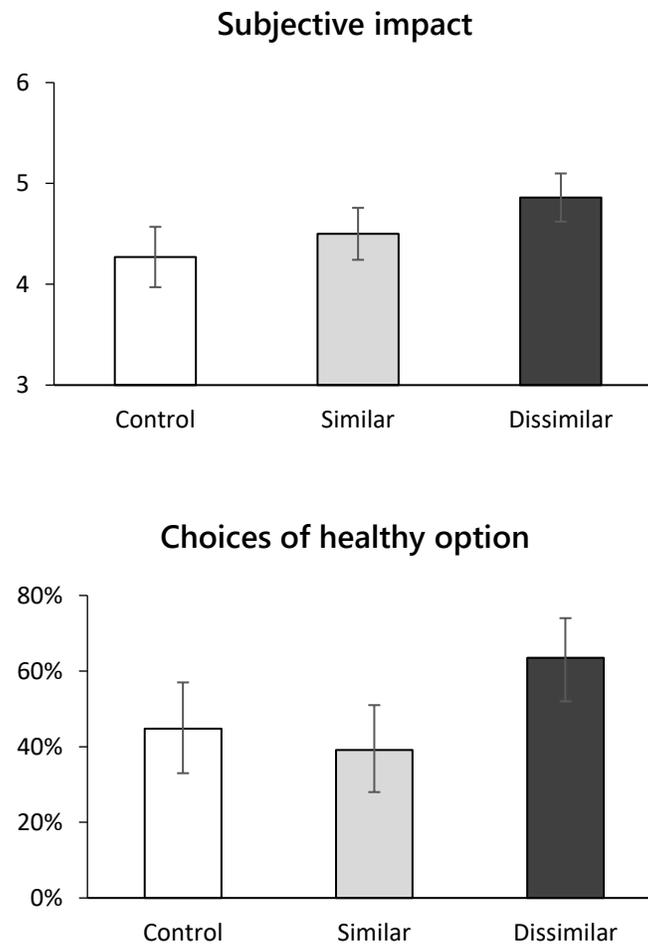
their choice to work out at the gym rather than engage in the foregone alternatives they had previously described. Participants in the control condition instead simply evaluated their decision to exercise without being prompted to consider any alternatives.

After the evaluation, participants were told that they would receive an energy bar as a “thank-you” gift for completing the survey. The participants indicated which of two energy bars (“wholesome mix of healthiness: KIND almond, walnut & macadamia” vs. “sweet and salty indulgence: KIND dark chocolate & peanut butter”) they would like to receive. On the final page, participants described briefly what they had done at the gym, and indicated how long they had worked out (in minutes), how often they worked out (1 = *Less than 1 time a month*, 5 = *Almost every day*), and how much they enjoyed working out (1 = *Not at all*, 7 = *Very much*). To confirm that participants were pursuing an exercising goal, we also measured how committed they were to working out and how important it was to them to work out regularly (1 = *Not at all*, 7 = *Very much*), as well as their gender and age for demographic information. Upon the completion of the survey, each participant was given the energy bar they had selected in the survey.

## **Results**

*Subjective impact on an exercising goal.* We averaged the two measures for participants’ commitment to and importance of an exercising goal ( $r = .71$ ). As we expected, given the population we recruited, participants on average reported exercising as an active goal ( $M = 5.60$ ,  $SD = 1.35$ ;  $t(199) = 19.46$ ,  $p < .01$  when compared with the midpoint of the scale (4) in one-sample t-test).

Figure 5: THE EFFECT OF FOREGONE-OPTION DIVERSITY ON SUBJECTIVE IMPACT AND SUBSEQUENT CHOICE



Note: Error bars depict 95% Confidence Intervals.

A one-way ANOVA on the subjective impact measure ( $\alpha = .68$ ) revealed a significant main effect of alternatives condition ( $F(2, 207) = 5.05, p = .007$ ; see Figure 4). Participants in the dissimilar foregone-alternatives condition felt they had made a greater impact on their exercise goal than either (1) those in the similar foregone-alternatives condition ( $M_{\text{similar}} = 4.50, SD_{\text{similar}} = 1.07, M_{\text{dissimilar}} = 4.86, SD_{\text{dissimilar}} = 1.03; \beta = .36, t(141) = 2.04, p = .042$ ) or (2) than those in the

control condition ( $M_{\text{control}} = 4.27$ ,  $SD_{\text{control}} = 1.22$ ;  $\beta = .59$ ,  $t(139) = 3.09$ ,  $p = .002$ ). Participants in the similar foregone-alternatives condition did not show a significant difference in their subjective impact from those in the control condition ( $\beta = .23$ ,  $t(134) = 1.15$ ,  $p = .247$ ). These results rule out the interpretation that considering similar alternatives reduces the subjective impact of the prior goal-consistent choice on the overall goal. Instead, the results suggest that considering foregone options enhances subjective impact primarily when the foregone options are dissimilar, confirming our proposition. The effect of foregone-option diversity remained significant after including control measures, including exercise duration, frequency of gym visit, and enjoyment ( $F(2, 194) = 4.64$ ,  $p = .011$ ).

*Subsequent food choice.* The majority of participants (64%) asked to recall dissimilar alternative activities they could have chosen instead of exercising selected the healthier energy bar. However, the participants prompted to instead consider similar foregone alternatives were significantly less likely to select the healthier option (39%,  $\chi^2 = 7.55$ ,  $p = .006$ ) as were participants who were not prompted to consider any alternatives at all (45%,  $\chi^2 = 4.25$ ,  $p = .039$ ; see Figure 4). The rate of choosing the healthy option did not differ between the similar foregone-alternative and control conditions ( $p = .62$ ).

## ***Discussion***

Consistent with the results in the previous studies, study 5 confirms that considering dissimilar forgone options increases subjective impact of a goal-consistent choice on the focal goal, motivating people to persist in goal pursuit. We replicated the foregone diversity effect in a naturalistic setting with real goal-consistent behavior and documented the consequences for real choices.

Moreover, study 5 replicated our findings in a broader context, involving multiple subgoals that relate to a superordinate goal. The current findings showed that greater perceived impact on one domain of a subgoal (exercising) due to consideration of diverse foregone alternatives can spill over, influencing behaviors in a distinct subgoal domain (healthy eating).

Although we observed the expected patterns of results in both subjective impact and subsequent choices, unlike the two prior studies, the subjective impact of the initial choice on the domain-specific goal pursuit did not show a significant mediation effect on the subsequent choice (although the direction of the effect was consistent with our prior studies; see Online Appendix F), arguably because the subjective goal-impact was on the exercise goal whereas the relevant domain to their subsequent choice was food. The goal of this study was to test the practically relevant question of whether foregone-option diversity for a choice in one aspect of a superordinate goal would impact a choice relating to another aspect of the same superordinate goal. However, it would be useful for future research to more thoroughly investigate how perceived goal-impact for both the specific aspects as well as for the superordinate goal impact subsequent motivation.

To evaluate our ability to draw broader conclusions about the process underlying the foregone diversity effect, we conducted a meta-analysis of the evidence for mediation by subjective impact on goal persistence across studies. To provide an estimate of the effect size found in the same experimental design, we combined data from five studies that include similar vs. dissimilar goal-inconsistent alternatives as an independent variable, subsequent choice as a dependent variable, and subjective impact as a mediator: Study 3 (goal-inconsistent alternatives conditions), Study 4 (choice for different event conditions), Study 5 (excluding control condition), and supplemental studies 2 and 3 (choice for tomorrow conditions; see Online

Appendix G and H). The combined model of the five studies ( $n = 805$ ) found strong overall evidence that higher subjective goal-impact due to considering foregone diverse (vs. similar) goal-inconsistent alternatives increased the likelihood of choosing a goal-consistent option for the subsequent decision-making ( $b = .11$ ,  $SE = .04$ ,  $95\% \text{ CI} = [.0520, .1935]$ ; see Online Appendix I).

## GENERAL DISCUSSION

The present research suggests that the way in which people consider foregone options can influence how they evaluate the impact of their past choice on their goals, as well as influence what they choose subsequently. We demonstrated this foregone diversity effect in multiple different goal contexts, including savings (study 1), healthy eating (studies 2 and 3), and exercise (studies 4 and 5). Across five studies (and four supplemental studies in the appendix), we found that when consumers considered dissimilar (vs. similar) goal-inconsistent alternatives that they could have chosen instead of the goal-consistent choice they made, they believed that they had sacrificed more to be consistent with their goal and had made greater impact towards the goal. They were then more likely to stick to the goal in a subsequent hypothetical (studies 1 and 4) or real choice involving the same goal (study 3) or a related goal (study 5). Taken together, these results provide converging evidence that the type of considered alternatives to a prior choice can significantly impact evaluations of the past choice and motivation to further pursue a target goal.

### *Theoretical contributions*

The current research makes multiple contributions to the literature on choice and goal pursuit. First, this research advances our understanding about the role of choice sets in goal-

directed behavior. Whereas previous research on choice sets has primarily focused on how the composition of *current* choice alternatives affects evaluations of and preferences between those alternatives, we investigate the effect of choice sets in sequential decisions, demonstrating that the type of foregone alternatives from a *prior* decision that are salient influences people's subsequent decisions. Our research bridges the choice set and goal pursuit literature, by showing that the diversity among foregone choice-set alternatives that people consider affects their motivation to pursue a focal goal, resulting in different subsequent goal-related choices.

Furthermore, the current findings shed new light on the role of memory in goal pursuit. Whereas most prior research investigates the effect of actual unchosen options in a choice set, the present research suggests that *mental representation* of foregone options can impact how consumers evaluate their past choice and change their future goal-related decisions. Specifically, in studies 1, 3, and 5, participants simply recalled alternatives they could have chosen, constructing the choice set retrospectively. This suggests that merely considering dissimilar goal-inconsistent paths afterwards, rather than actually forgoing them at the time of choice, can influence subsequent goal persistence. Further, we find that what matters for motivation is perceived, rather than objective, diversity in the foregone alternatives. In study 4, manipulated categorization cues changed participants' perceptions of the diversity of the same set of alternatives, and people who then perceived greater variety among the *same* alternatives saw their goal-consistent choice as more impactful and were more motivated to subsequently persist in their goal.

Our findings regarding subsequent choices demonstrate behavioral consistency, in which past behavior leads individuals to do more of the same behaviors (see Merritt, Effron and Monin 2010 for a review). However, our findings are in contrast with a generalized view of licensing, in

which a positive initial behavior liberates individuals to engage in less positive behaviors subsequently, which has been documented in various domains including prosocial behavior and consumer choice (Jordan et al. 2011; Khan and Dhar 2006; Mazar and Zhong 2010). This raises the question of whether considering diverse foregone alternatives might sometimes instead lead to less goal persistence due to higher perceived impact on goal pursuit.

Recently researchers have suggested numerous moderators that could explain the seemingly contradictory findings that past goal-consistent behavior can promote either consistency and further engagement or licensing and disengagement from the initial action. For example, consistency with (vs. change from) past choices is more likely to occur when the target behavior has stronger relevance to their values or identity (Clot, Grolleau and Ibanez 2016; Effron, Cameron and Monin 2009), when people draw inferences from their initial action that they value the target behavior (Fishbach and Dhar, 2005; Gneezy et al. 2012; Kristofferson, White and Peloza 2014), when the initial goal-consistent action is for a goal people autonomously chose to endorse (Zhang et al. 2010), and when prior outcomes make people optimistic about future outcomes (Yang and Urminsky 2015). In particular, Gneezy et al. (2012) suggests that initial positive action incurs another positive subsequent behavior only when the initial action was costly, involving a contribution of time or money of an agent.

Our studies explored situations in which participants consider what they have given up to remain consistent with a goal that they actively endorsed. Therefore, since considering diverse, compared to similar, foregone alternatives made participants feel that they had sacrificed more, it increased the likelihood of another goal-consistent choice. Future research might explore whether the conditions that promote licensing would moderate the effects in this paper.

Lastly, our findings demonstrate the importance of goal importance, not only to goal-consistent choices as has been previously shown (Cordova and Lepper 1996; Deci and Ryan 2000; Zuckerman et al. 1978), but to how people cognitively process goal related information. As study 2 demonstrates, consideration of diverse alternatives results in larger perceived impact of a goal-consistent choice among those who hold the goal, but not among those who do not. This can result in otherwise unexplained heterogeneity in how people process goal pursuit. In a supplemental meta-analysis of 5 studies involving weight-loss goals (study 2 plus four additional studies; see Online Appendix J), we find a significant interaction between the diversity of alternatives considered and gender on subjective impact ( $p = .04$ ). Considering diverse alternatives to a healthy food choice results in greater perceived impact of the choice on weight-loss goal progress specifically among women ( $p < .01$ ), who are more likely to hold an active weight-loss goal (Myrseth, Fishbach, and Trope 2009), but not among men ( $p = .81$ ). We observed this moderation again when goal importance was manipulated (see Online Appendix K). These results suggest that goal importance, which may affect motivation to process distinctive features of foregone alternatives, is a critical pre-condition for the foregone diversity effect to occur.

### ***Implications***

These findings offer interesting possibilities for future research. Our studies have focused on the role of alternatives specifically when individuals have made a goal-*consistent* choice. It would be interesting to investigate the effect of foregone-option diversity when participants have made a goal-*inconsistent* choice, failing to follow their goal. After succumbing to a temptation, would the diversity among the foregone goal-consistent options impact the perceived severity of the goal-pursuit failure and influence subsequent decisions? Extending our theorizing in the

current work, we would predict that when people choose a goal-inconsistent option over dissimilar goal-consistent alternatives, they would evaluate their previous failure as more of a setback to goal attainment.

Another interesting possibility to explore is whether individuals employ diversity evaluation as a self-control device. Consumers often show motivated reasoning, selectively interpreting ambiguous information in ways that are consistent with their preferred future choice. Particularly in a goal-pursuit context, consumers exploit malleability in the mental accounting process to justify their spending, for example, by classifying ambiguous expenses to an account with a remaining surplus or constructing mental accounts to accommodate unclassified expenses (Cheema and Soman 2006). Consumers exaggerate or downplay perceived progress depending on their goal status to increase motivation (Huang et al. 2012). Future research can examine whether consumers tend to construe foregone alternatives as more dissimilar to exaggerate the impact of the initial goal-consistent choice and maintain their motivation to persist towards their goal.

The present research also suggests that it may be beneficial to incorporate consideration of alternatives in interventions designed to enhance motivation. In study 5, participants in the control condition, who were not explicitly asked to consider foregone alternatives to the exercise they had actually chosen to do, indicated less impact on their goal and were less likely to choose the healthy food than did those prompted to consider dissimilar alternatives. Therefore, a simple external cue inducing people to look back at various alternatives they have foregone thus far to stick to their goal may help people stay motivated.

This could be particularly beneficial in goal-relevant industries, such as healthcare, foods, financial services, and education. When interacting with consumers, messages emphasizing their

past success in resisting diverse temptations for goal-pursuit (e.g., “You defeated so many temptations last time. Win again!”) may be more helpful to encourage behavioral consistency than merely tracking their past success or failure. For example, in goal tracking apps, consumers can be prompted to name goal-inconsistent alternatives and then the diversity among the alternatives can be highlighted to them. Study 4 suggests that one simple way to signal diversity of alternatives is to split them into more categories. This suggests that such framing cues could be an effective intervention to boost people’s perception of the diversity among foregone options, thereby enhancing their motivation. Marketers may be able to leverage this strategy to help consumers get over the “stuck in the middle” effect, especially when the objective impact and progress of goal seems murky. However, using such interventions to boost self-regulation, such as weight loss, healthy eating, or saving, is likely to only be beneficial among people who already care about the goal.

In sum, our findings suggest that considering diverse roads not taken motivates people to stick to their path when they are committed to reaching the destination. When people consider having foregone diverse (vs. similar) goal-inconsistent alternatives, they perceive they have made greater sacrifice to make a goal-consistent choice, which heightens the subjective impact of the past choice on overall goal pursuit, finally resulting in higher likelihood to make subsequent goal-consistent choices.

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### Online Appendix A: Pre-test results

A pretest (N = 142) was conducted to explore the prevalence of each goal: saving (study 1), losing weight (study 2), eating healthy (eating more vegetables, less meat, less sugar; study 3), and exercising regularly (study 4 and 5). At the end of an unrelated survey, participants indicated whether they currently endorse each goal or not. The order of goals was randomized. Percentages of participants who indicated they were endorsing each goal are as below.

	Endorsement rate (# of yes/n)
Saving	96% (135/142)
Losing weight	72% (102/142)
Eating healthy	89% (126/142)
Exercising regularly	87% (123/142)

## Online Appendix B: Supplemental study 1

### SUBJECTIVE IMPACT ON A SAVINGS GOAL

#### *Method*

We collected 120 valid completed surveys from participants in the United States (64 male,  $M_{\text{age}} = 41.72$ ) on Amazon Mechanical Turk (MTurk). As in Study 1, all participants were first asked to recall their recent experience that they decided not to spend money and save it, and wrote down how they wanted to spend the money and how much money they had saved. Next, they were asked to list two other ways that they could have spent the same amount of money for themselves. Then participants were randomly assigned to one of the two conditions. In the similar alternatives condition, they were asked to think about and describe how the three ways to spend the money are similar to one another. In the dissimilar condition, they described how the alternatives are dissimilar from one another. As a manipulation check for the option diversity manipulation, participants indicated the extent to which they agreed with the following statements on a 7-point scale (1 = *Strongly disagree*, 7 = *Strongly agree*): (1) “Alternatives overlap in term of what needs they meet” (reverse-coded); (2) “All of the alternatives are more or less the same” (reverse-coded); (3) “Each alternative satisfies different desires I want to fulfill”.

After this experimental manipulation, participants rated how much of (1) an achievement, (2) contribution, or (3) progress they think their choice to save (rather than to spend) made towards their savings goal (1 = *None*, 7 = *A lot*). These three measures were averaged into a subjective impact score. Finally, we measured the importance of the savings goal using the same

measure used in Study 1, the difficulty of recalling their past decision not to spend money, as well as their gender and age for demographic information.

### ***Results***

The composite score of savings goal importance ( $\alpha = .84$ ) revealed that saving was an important and active goal among participants ( $M = 5.88$  out of 7,  $SD = .97$ ;  $t(119) = 21.18$ ,  $p < .001$  compared to the midpoint (4)). As we intended, participants in the dissimilar condition indicated that the alternatives they had generated were more diverse than did the participants in the similar condition ( $M_{\text{similar}} = 4.25$ ,  $SD_{\text{similar}} = .88$ ,  $M_{\text{dissimilar}} = 5.38$ ,  $SD_{\text{dissimilar}} = 1.04$ ;  $t(118) = 6.45$ ,  $p < .001$ ).

To test our main hypothesis, we computed a composite score ( $\alpha = .92$ ) reflecting the subjective impact of a goal-consistent choice. Participants in the dissimilar condition reported a greater impact of their past goal-consistent choice on their goal than did participants in the similar condition ( $M_{\text{similar}} = 4.37$ ,  $SD_{\text{similar}} = 1.37$ ,  $M_{\text{dissimilar}} = 4.99$ ,  $SD_{\text{dissimilar}} = 1.23$ ;  $t(118) = 2.60$ ,  $p = .011$ ). The effect of foregone-alternative diversity on the subjective impact remained significant controlling for the dollar amount saved and the recall task difficulty ( $b = .58$ ,  $t(116) = 2.44$ ,  $p = .016$ ).

**Online Appendix C: Regression tables (study 2)**

The effect of Option diversity  $\times$  Goal importance on subjective impact

	b	SE	<i>t</i>	<i>p</i>	
Constant	3.80	.48	7.95	< .001	***
Option diversity (1 = Similar)	.85	.60	1.43	.155	
Goal importance	.62	.19	3.22	.001	**
BMI	.00	.01	.46	.647	
Order	-.01	.14	-.08	.939	
Diversity*Importance	-.55	.27	-2.06	.040	*

The effect of Option diversity  $\times$  Goal importance on satisfaction

	b	SE	<i>t</i>	<i>p</i>	
Constant	4.83	.47	10.36	< .001	***
Option diversity (1 = Similar)	.33	.66	.50	.621	
Goal importance	.24	.21	1.16	.245	
Diversity*Importance	-.24	.30	-.80	.427	

The effect of Option diversity  $\times$  Goal importance on feeling good about oneself

	b	SE	<i>t</i>	<i>P</i>	
Constant	5.02	.42	11.93	< .001	***
Option diversity (1 = Similar)	.02	.60	.03	.977	
Goal importance	.25	.19	1.31	.191	
Diversity*Importance	-.04	.27	-.16	.873	

The effect of Option diversity  $\times$  Goal importance on difficulty

	b	SE	<i>t</i>	<i>P</i>	
Constant	3.01	.51	5.90	< .001	***
Option diversity (1 = Similar)	-.57	.72	-.79	.432	
Goal importance	.53	.23	2.33	.020	*
Diversity*Importance	.18	.33	.57	.570	

The effect of Option diversity  $\times$  Goal importance on attractiveness

	b	SE	<i>t</i>	<i>P</i>	
Constant	3.37	.44	7.82	< .001	***
Option diversity (1 = Similar)	.53	.61	.86	.389	
Goal importance	.30	.19	1.55	.122	
Diversity*Importance	-.30	.27	-1.09	.277	

## The effect of satisfaction, feeling good about oneself, attractiveness, and difficulty on subjective impact

	b	SE	<i>t</i>	<i>p</i>	
Constant	.60	.24	2.56	.011	*
Satisfaction	.08	.04	1.76	.078	.
Good	.65	.05	13.72	< .001	***
Difficulty	.15	.03	5.36	< .001	***
Attractiveness	-.03	.03	-1.10	.271	

The effect of Option diversity  $\times$  Goal importance on subjective impact controlling for Satisfaction, Good feeling about oneself, Difficulty, and Attractiveness

	b	SE	<i>t</i>	<i>p</i>	
Constant	-.11	.38	-.28	.778	
Option diversity (1 = Similar)	.95	.40	2.34	.020	*
Goal importance	.39	.13	3.00	.003	**
Satisfaction	.06	.04	1.42	.157	
Good	.66	.05	14.05	< .001	***
Difficulty	.14	.03	5.05	< .001	***
Attractiveness	-.04	.03	-1.51	.131	
BMI	.00	.00	.42	.672	
Order	.07	.09	.69	.490	
Diversity*Importance	-.55	.18	-3.07	.002	**

### Online Appendix D: Pre-test results of energy bars

We conducted a pretest ( $N = 45$ ) on MTurk about the two energy bars we planned to use in our studies – wholesome mix of healthiness: KIND almond, walnut & macadamia” vs. “sweet and salty indulgence: KIND dark chocolate & peanut butter. We wanted to confirm that people evaluate the two energy bars differently, in terms of perceived healthiness, indulgence, and congruence with a health goal.

We presented pictures, side-by-side, of the two energy bars and the same descriptions that would be used in main studies. Participants evaluated how well each adjective (tasty, healthy, enjoyable, and indulgent) described the energy bars, using a 10-point scale (1 = *Not at all*, 10 = *Extremely*). They also estimated the retail price on a sliding bar from \$0 to \$10. In addition, participants imagined that they were considering eating one of the energy bars after exercising and indicated 1) how guilty they would feel, 2) how much it would ruin their goal of being fit, 3) how much it would be inconsistent with their goal of being fit if they ate each of the bars, using the same 10-point scale.

Results confirmed that people perceived the almond, walnut & macadamia energy bar as healthier (6.77 vs. 5.02,  $p < .01$ ), less indulgent (5.82 vs. 7.39,  $p < .01$ ), and less tasty (7.09 vs. 7.77,  $p = .06$ ) than the dark chocolate & peanut butter energy bar. There was no significant difference in enjoyment (7.05 vs. 7.50,  $p = .28$ ) or estimated retail price (\$2.48 vs. \$2.53,  $p = .75$ ). Also, people indicated that eating the dark chocolate & peanut butter energy bar would make them feel guiltier (4.75 vs. 3.34), more negatively impact their health goal (4.70 vs. 3.41), and would be more inconsistent with the health goal (5.80 vs. 4.20, all  $p$ 's  $< .01$ ).

### Online Appendix E: Stimuli of Study 3

Please take a moment to imagine the following situation:

Recently you set exercise and workout goals. Since you cannot go to the gym these days, you started to do home workouts. You searched home workout programs online and have saved some of them to your video playlist.

You haven't exercised yet today, and in the evening, you opened your playlist.

[Uncategorized condition]

#### Your Playlist

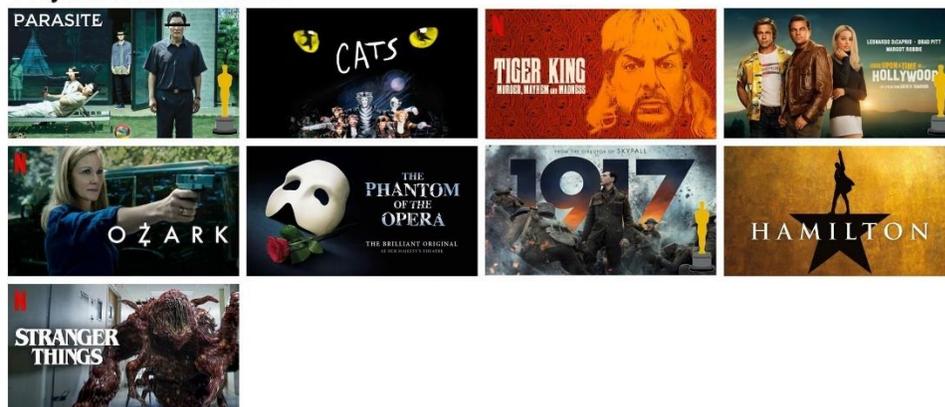


[2 categories condition]

#### Playlist 1: Home Workouts



#### Playlist 2: Entertainment



[4 categories condition]

### Playlist 1: Home Workouts



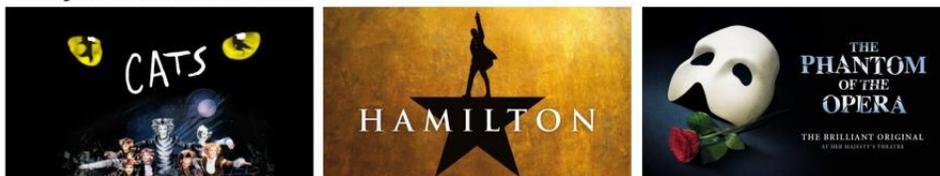
### Playlist 2: Netflix Series



### Playlist 3: 2020 Oscar Winners



### Playlist 4: Musicals



You stared at your playlist for a moment.

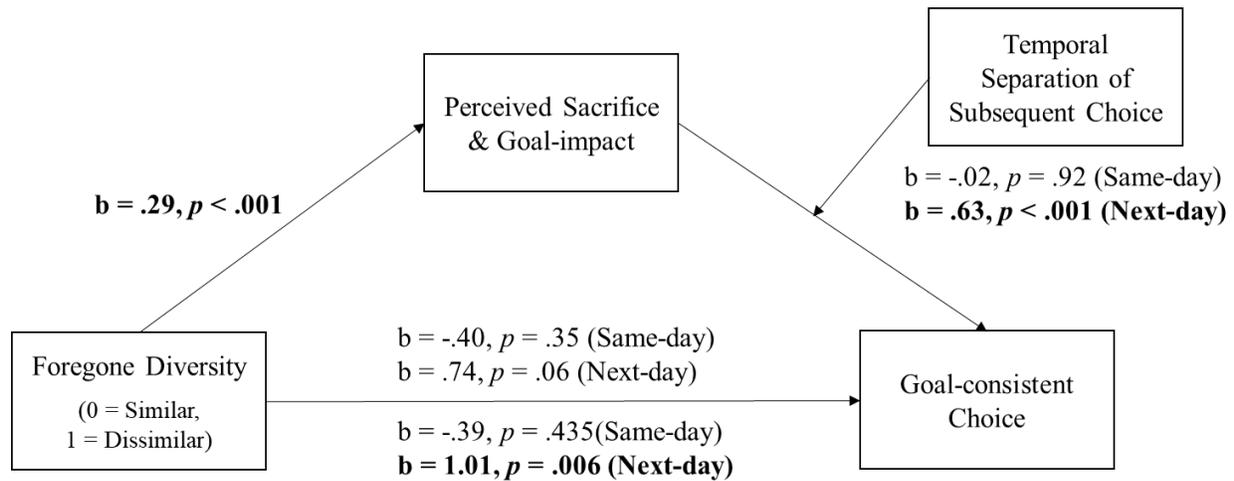
You could have watched other videos in your playlist, but after some consideration, **you finally decided to play the "UPPER BODY WORKOUT" video and follow the workout program.**

Please take some time to imagine the situation as vividly as possible.

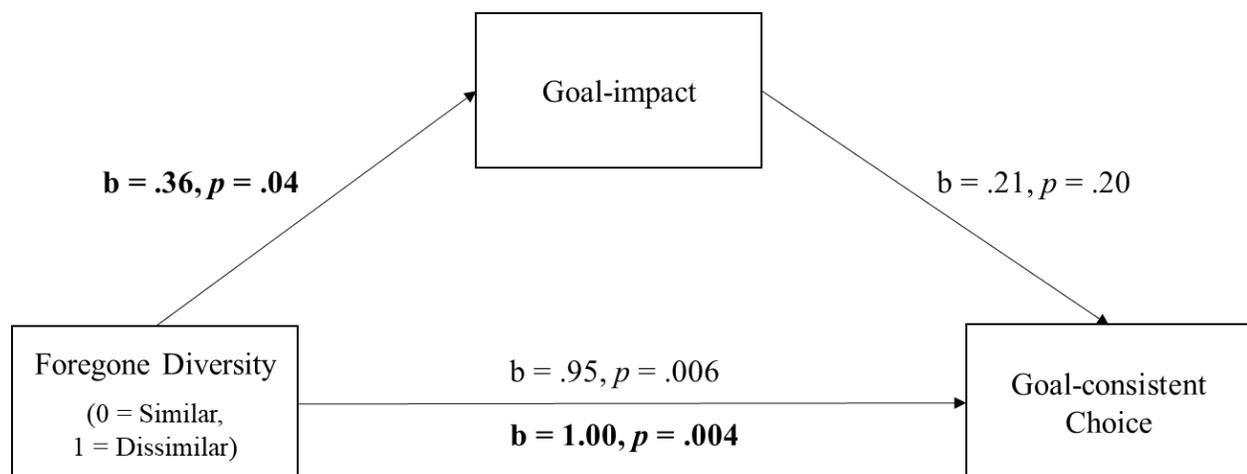
You will be able to proceed after 15 seconds.

## Online Appendix F: Diagram of moderated mediation in Studies 4 and 5

[Study 4]



[Study 5]



## Online Appendix G: Supplemental study 2

### *Method*

We collected 361 valid complete surveys from Mturk participants in the United States (193 male,  $M_{\text{age}} = 39.40$ ). This study employed a 2 (2 categories vs. 4 categories)  $\times$  2 (same vs. next-day decisions) between-subjects design. Study procedure and measures were exactly the same with Study 3, except that the current study didn't include the uncategorized condition and perceived sacrifice measures.

### *Results*

Manipulation of perceived variety was successful ( $M_{4 \text{ cat}} = 5.02$ ,  $SD_{4 \text{ cat}} = 1.10$ ,  $M_{2 \text{ cat}} = 4.40$ ,  $SD_{2 \text{ cat}} = .97$ ;  $t(359) = 5.67$ ,  $p < .001$ ). Participants in the 4 categories condition, who perceived greater diversity among the alternatives, reported higher subjective impact than those in the 2 categories condition ( $M_{4 \text{ cat}} = 5.12$ ,  $SD_{4 \text{ cat}} = 1.27$ ,  $M_{2 \text{ cat}} = 4.83$ ,  $SD_{2 \text{ cat}} = 1.11$ ;  $t(359) = 2.33$ ,  $p = .020$ ). A logistic regression analysis on the subsequent workout choice showed a marginal interaction ( $b = .86$ ,  $se = .45$ ,  $Wald = 3.60$ ,  $p = .058$ ). When making a choice for tomorrow, participants who perceived foregone alternatives more varied were more likely to choose a longer workout program (49% vs. 40%,  $\chi^2 = 1.27$ ,  $p = .26$ ), whereas the opposite pattern was observed when making a choice for the same day (23% vs. 32%,  $\chi^2 = 1.55$ ,  $p = .21$ ).

## Online Appendix H: Supplemental study 3

### CONSIDERING DISSIMILAR ALTERNATIVES INCREASES MOTIVATION FOR A PROXIMATE DECISION

#### *Method*

We collected 174 valid complete surveys from Mturk participants in the United States (45% male,  $M_{\text{age}} = 39.05$ ). This study employed a 2 (option diversity: similar or dissimilar)  $\times$  2 (temporal distance of subsequent choice: proximate or distant) between-subjects design.

First, participants read a short description of what “healthy diet” means as below:

*"A healthy diet" is one that helps to maintain or improve your health, providing balanced nutrients that are essential for your body to function properly. According to a recent report from the World Health Organization (WHO) about the current US diet pattern, below are the three major factors of a health promoting diet.*

- 1. High consumption of plant-based foods, such as vegetables, fruits, whole grains, and nuts.*
- 2. Low consumption of animal-based foods, particularly red meat and processed meat (including bacon, ham, and sausages.)*
- 3. Low consumption of sugar.*

Then, we asked participants to recall and write about a recent experience when they had made a healthy food choice that met at least one of the criteria stated above. As in study 1, participants then generated either three similar or three dissimilar unhealthy alternatives they could have chosen instead of the healthy food that they did choose. After describing how the three alternatives were similar or dissimilar to one another, participants evaluated how much

impact they thought they had made with their past goal-consistent choice. They also answered three additional measures—decision satisfaction, feeling good about oneself, and decision difficulty—as in study 2.

The survey then asked participants to imagine that they were going to have a business dinner and they had to select their meal, either a healthy but less tasty option (“Get healthy with well-balanced dishes! Enjoy a green goddess salad, a nutrient-rich entrée, and a low-sugar dessert”) or a less healthy but tasty meal (“Treat yourself with tasty dishes! Enjoy a savory appetizer, a full-flavored entrée, and a delightful dessert”). In the proximate condition, the choice was for a dinner tomorrow, whereas in the distant condition, participants made a choice for a dinner that would take place in one month.

Finally, to validate that participants were endorsing healthy eating as a goal, we measured their consciousness of what they are eating, commitment to healthy eating, and importance of eating healthy, using a 7-point scale (1 = *Not at all*, 7 = *Very much*). Participants indicated their height, weight, gender, and age as demographic information.

## ***Results***

As we intended, and confirming our pretest result, the composite score of healthy eating goal importance ( $\alpha = .85$ ) revealed that, on average, participants were pursuing eating healthy as an important and active goal ( $M = 5.24$ ,  $SD = 1.17$ ;  $t(173) = 13.96$ ,  $p < .001$  when compared with the midpoint of the scale (4) in one-sample t-test).

*Subjective impact.* First, we tested our main hypothesis that considering dissimilar alternatives (instead of similar alternatives) increases the perceived impact of a goal-consistent choice on goal progress. Because we manipulated temporal distance after participants had already reported their subjective impact, we collapsed across temporal distance conditions, and

conducted a one-way ANOVA with the option diversity manipulation as a factor. Replicating our previous findings, participants who considered dissimilar unhealthy alternatives felt they had achieved greater impact on their healthy eating goal compared to those who considered similar alternatives ( $M_{\text{similar}} = 4.74$ ,  $SD_{\text{similar}} = 1.44$ ,  $M_{\text{dissimilar}} = 5.23$ ,  $SD_{\text{dissimilar}} = 1.33$ ;  $F(1, 172) = 6.68$ ,  $p = .011$ ). The effect of option diversity remained significant after controlling for decision satisfaction, good feelings about oneself, decision difficulty, and individual's BMI ( $F(1, 168) = 4.53$ ,  $p = .035$ ; see Online Appendix J).

*Subsequent meal choice.* A logistic regression analysis on the subsequent meal choice revealed a significant interaction between option diversity and temporal distance ( $\beta = -2.02$ , Wald = 8.16,  $p = .004$ ; see Figure 3). In the proximate condition, in which participants made a decision about a dinner tomorrow, considering dissimilar unhealthy alternatives to a prior healthy choice yielded more choices of a healthy meal, compared to considering similar unhealthy alternatives (83% vs. 51%,  $\chi^2 = 8.17$ ,  $p = .004$ ). However, the diversity of goal-inconsistent alternatives had no effect when participants instead made a dinner choice for the distant future (1 month away; 80% vs. 70% chose the healthy option,  $\chi^2 = .64$ ,  $p = .425$ ). The interaction between foregone-alternative diversity and temporal distance remained significant after controlling for the three affective measures and individual's BMI ( $\beta = -1.81$ , Wald = 6.20,  $p = .013$ ).

*Mediation analyses.* We conducted mediation analyses separately for each temporal condition, using the PROCESS macro (Preacher and Hayes 2004; Hayes 2013), to test whether subjective impact of the prior goal-consistent choice on goal progress mediated the effect of option diversity on healthy food choice in the present but not the future. The regression model revealed that when participants made a decision about the present, higher perceived impact due

to considering dissimilar alternatives increased choices of the healthy option (indirect effect  $\beta = .32$ , 95% CI = [.04, 1.02]). However, when making a decision about the distant future, perceived goal impact did not mediate the effect of option diversity on the subsequent goal-related choice (indirect effect  $\beta = .13$ , 95% CI = [-.03, .57]).

### Online Appendix I: Supplemental meta-analysis 1

#### Logistic regression results on Goal-consistent Choice

	b	SE	<i>t</i>	<i>p</i>	
Constant	-1.15	.33	-3.45	< .001	***
Option diversity (1 = Diss)	.67	.15	4.42	< .001	***
Subjective impact	.25	.06	4.10	< .001	***
Dummy 1 = Study 4	-1.28	.22	-5.73	< .001	***
Dummy 2 = Study 5	-.29	.22	-1.33	.18	
Dummy 3 = Supp 2	.44	.28	1.58	.12	
Dummy 4 = Supp 3	-.69	.21	-3.32	<.001	***

#### Mediation of Subjective Impact on Goal-consistent Choice

	n	Effect	Boot SE	LLCI	ULCI
Study 3	256	.0904	.0555	.0043	.2194
Study 4	156	.2039	.1236	.0003	.4916
Study 5	141	.0522	.0753	-.0791	.2264
Supplemental Study 2	165	.1119	.0857	-.0040	.3265
Supplemental Study 3	85	.2007	.1614	-.0465	.5848
Combined	805	.1130	.0352	.0520	.1935

### Online Appendix J: Supplemental meta-analysis 2

The effect Option diversity and Gender on subjective impact

	b	SE	t	p	
Constant	5.45	.09	61.78	< .001	***
Option diversity (1 = Similar)	-.28	.11	-2.60	.009	**
Gender (1 = Male)	-.60	.11	-5.64	< .001	***
Dummy 1 = pilot 1	.85	.13	6.76	< .001	***
Dummy 2 = pilot 2	.75	.10	7.25	< .001	***
Dummy 3 = pilot 3	.44	.11	3.97	< .001	***
Dummy 4 = pilot 4	.35	.12	3.01	.003	**
Diversity*Gender	.31	.15	2.04	.042	*

	n	% male	age	Differences from Study 2
Pilot 1	128	44	33.64	- Imagined having decided to have an apple (not apple chips) - No similarity evaluation phase - No pictures of alternatives
Pilot 2	220	46	32.95	- Wrote 1) what they choose, 2) what they could have chosen instead - No similarity evaluation phase - No pictures of alternatives
Pilot 3	179	58	32.62	- Wrote either 1) specific names of each alternatives or 2) how they would describe, in their own words, what they could have chosen - No similarity evaluation phase - No pictures of alternatives
Pilot 4	152	55	37.45	- No similarity evaluation phase - No pictures of alternatives
Study 2	468	53	39.04	- No pictures of alternatives
Total	1147	52	36.05	

## Online Appendix K: Supplemental study 4

### MANIPULATED GOAL IMPORTANCE MODERATES THE EFFECT OF DIVERSE ALTERNATIVES

#### *Method*

We collected 382 valid completed surveys from US Mturk participants (47% male,  $M_{\text{age}} = 37.99$ ). The experiment employed a 2 (option diversity: similar or dissimilar)  $\times$  2 (goal importance: high or low) between-subjects design.

First, we manipulated the personal importance of a donation goal by having participants read an article either stressing the importance of donations from all individual donors (high importance) or emphasizing the particular importance of wealthy donors (low importance). Participants in the high importance condition read the following passage that emphasized the impact and responsibilities of individual donors like our participants:

*Charities need to raise donations to continue doing their important work. It is crucial that everyone chips in and contributes their share.*

*A recent report from National Center for Charitable Statistics found that only about half of Americans donate to charity. Many people think their donation is too small to make a difference. However, even small donations can have a large impact on the lives of people in need. For example, a \$2 donation can provide 7 children with micronutrient fortification they need for a year.*

*Charities need the support of as many small individual donors as possible. When everyone participates and gives what they can, it helps charities to spread the word about their cause. Charities operate more effectively when they have a broad base of support, not just depending on a handful of wealthy donors.*

In contrast, participants in the low importance condition read the following passage that emphasized the responsibilities of a small number of wealthy people, who are different from most of our participants:

*Charities need to raise donations to continue doing their important work. It is crucial that wealthy people chip in and contribute their share.*

*A recent report from National Center for Charitable Statistics found that the wealthy give a smaller share of their income to charities than other people who earn less do. The wealthiest Americans, with earnings in the top 20 percent, donate only 1.3 percent of their income to charity. In comparison, middle-class and lower-income Americans donate more, 5.2 percent of their income.*

*Charities need the support of as many wealthy donors as possible. When wealthy Americans give their fair share, it helps charities to reduce their operating expenses.*

*Charities operate more effectively when they have sufficient support from wealthy donors, not just depending on chasing after small donations from people who can't afford to give more.*

To ensure that participants read and comprehended the passage, we asked participants to write a one-sentence summary of the passage they read. We excluded 7 participants who gave incorrect answers, leaving 375 complete surveys for further analysis. As a manipulation check, we measured the personal importance of the donation goal to our participants, using the sum of three ratings: (1) “Donating to charities is important to me personally”; (2) “I plan to donate more in the future than I have in the past”; (3) “I feel personally responsible to make charitable contributions” using a 10-point scale (1 = *Completely disagree*, 10 = *Completely agree*).

All participants were first asked to think about and write down how they would like to spend \$100 for themselves. Next, participants were randomly assigned to one of two conditions. In the similar alternatives condition, they were asked to briefly list two similar alternative ways to spend the same amount of money, and explained why the three ways to spend the money are similar to one another. In the dissimilar alternatives condition, they listed two dissimilar alternatives and explained the dissimilarity of all three ways to spend the money. Participants then were asked to imagine that they had decided to donate an unexpected \$100 windfall of income to a charity, instead of spending it on one of the previously listed alternatives. After reading the scenario, participants reported the subjective impact as our main dependent variable, using the same measures in Study 3. As controlling variables, we also measured participants' affective evaluations about their choice and attractiveness of each options they provided in the alternative-listing phase. Finally, participants indicated their gender, age, and personal annual income.

### **Results**

*Manipulation check.* A 2 (manipulated option diversity: similar or dissimilar)  $\times$  2 (manipulated goal importance: high or low) ANOVA on the goal importance measure ( $\alpha = .88$ ) revealed only a significant main effect of the goal importance manipulation ( $M_{\text{high}} = 7.27$ ,  $M_{\text{low}} = 6.70$ ;  $F(1, 371) = 7.62$ ,  $p < .01$ ; all other  $p$ 's  $> .20$ ), indicating a successful manipulation.

*Subjective impact.* We predicted that considering dissimilar foregone options would result in higher perceived impact, but only among participants who perceived the focal goal as important. To test this prediction, we conducted a 2 (option diversity: similar or dissimilar)  $\times$  2 (goal importance: high or low) ANOVA on the composite measure of subjective impact ( $\alpha$

= .91). The results revealed a significant interaction ( $F(1, 371) = 5.87, p = .016$ ) as well as a significant main effect of option diversity ( $F(1, 371) = 6.26, p = .013$ ).

In the high goal-importance condition, when participants had been prompted to consider donating and helping charities as their responsibility, those who considered a set of dissimilar alternative ways of spending money felt they had made a greater impact by instead making the donation than did those who considered a set of similar alternatives ( $M_{\text{similar high}} = 5.30, SD_{\text{similar high}} = 1.47, M_{\text{dissimilar high}} = 5.97, SD_{\text{dissimilar high}} = 1.12; t(192) = 3.55, p < .01$ ). However, in the low importance condition, when prompted to consider donation as someone else's responsibility, diversity of the foregone alternatives did not affect perceived impact of the choice on their goal ( $M_{\text{similar low}} = 5.45, SD_{\text{similar low}} = 1.38, M_{\text{dissimilar low}} = 5.45, SD_{\text{dissimilar low}} = 1.28; t(179) = .02, p = .983$ ).

*Control measures.* We conducted the same  $2 \times 2$  ANOVAs on control measures. Results indicated no significant interaction or main effects for choice satisfaction, good feeling about oneself, and attractiveness of alternatives (all  $p$ 's  $> .10$ ). Participants did view the donation decision as more difficult when the donation goal was not personally important ( $M_{\text{high}} = 4.28, M_{\text{low}} = 4.82; t(371) = -2.98, p < .01$ ). Importantly, the effect of option diversity on subjective impact remained significant controlling for the control measures. In the high goal-importance conditions, considering dissimilar (vs. similar) alternatives led to higher subjective impact ( $\beta = .59, t(188) = 3.50, p < .001$ ) controlling for the other measures (including choice difficulty), whereas the diversity of considered alternatives did not yield a difference when the goal was not important ( $\beta = .17, t(175) = 1.09, p = .277$ ).

## Online Appendix L: Campus survey (study 5)

### Campus Survey

In the Campus Lab at the Center for Decision Research, we are interested in understanding people's judgment and decision making. In this survey, we would like you to think about your own experience and indicate how you think about your decision.

The estimated time to complete this survey is approximately 3 minutes.

Please read the following instruction and give us your answers.

---

Please think about how you could have spent your time instead of exercising.

Please write down one activity that you could have done **instead of exercising** for the last hour or so:

---

Please think about 2 other ways that you could have spent your time instead of exercising. Please think about activities that are **VERY SIMIAR** to the option that you wrote on the previous page.

1)

---

2)

---

Please explain **why** you think the 3 ways of spending your time that you just provided are **VERY SIMILAR** to one another.

---

---

---

Today, you made a decision to work out at the gym even though you could have done the other things that you just described on the previous page.

Now, please indicate how you evaluate this choice.

Please read the following questions and circle a number in response to each question.

How much of an achievement do you think your decision was for your goal to work out?

1 = Not at all      2      3      4 = Moderate      5      6      7 = A lot

How much of a contribution do you think your decision was for your goal to work out?

1 = Not at all      2      3      4 = Moderate      5      6      7 = A lot

How much progress on your goal to work out do you think you made by your decision?

1 = Not at all      2      3      4 = Moderate      5      6      7 = A lot

As a thank-you gift, we are offering 2 kinds of energy bars that you can choose one from.

Please indicate which one you'd like to get.

- Wholesome mix of healthiness: KIND almond, walnut & macadamia
- Sweet and salty indulgence: KIND dark chocolate & peanut butter

Thinking of your visit to the gym today, what were you doing at the gym?

---

How long did you work out at a gym today? \_\_\_\_\_ minutes

In general, how committed are you to "working out"?

1 = Not at all      2      3      4 = Moderate      5      6      7 = Very much

How important is it to you to work out regularly?

1 = Not at all      2      3      4 = Moderate      5      6      7 = Very much

How much do you enjoy working out in general?

1 = Not at all      2      3      4 = Moderate      5      6      7 = Very much

How often do you typically work out?

- Less than 1 time a month
- 1-2 times a month
- 1-2 times a week
- 3-4 times a week
- Almost everyday

What is your gender?

- Male
- Female

What is your age? \_\_\_\_\_