

The Multifinality Constraints Effect: How Goal Multiplicity Narrows the Means Set to a Focal End

Catalina Köpetz
University of Maryland, College Park

Tim Faber
University of Amsterdam

Ayelet Fishbach
University of Chicago

Arie W. Kruglanski
University of Maryland, College Park

In the presence of several objectives, goal conflict may be avoided via *multifinal* means, which advance all of the active goals at once. Because such means observe multiple constraints, they are fewer in number than the unconstrained means to a single goal. Five experimental studies investigated the process of choosing or generating such means for multiple goals. We found that the simultaneous activation of multiple goals restricted the set of acceptable means to ones that benefitted (or at least, did not harm) the entire set of active goals. Two moderators of this phenomenon were identified: (a) the feasibility of identifying multifinal means, which was dependent on the relations between the different active goals, and (b) the enhanced importance of the focal goal, which resulted in the inhibition of its alternatives and the consequent relaxation of multifinality constraints.

Keywords: goal conflict, self-regulation, means

People's self-regulation toward various objectives is often challenged by the presence of alternative goals that compete for these persons' mental and physical resources. Psychologists have long acknowledged the idea of *multiplicity* in human action. Neisser (1963), for instance, observed that "almost all human activity, including human thinking, serves not one, but a multiplicity of motives at the same time" (p. 195). Similarly, Atkinson and Birch (1970), theorizing on the dynamics of action, assumed that at any given point, many different action tendencies may coexist, representing concomitant motivational concerns. Whereas some alternative goals may be anticipated in advance and incorporated into individuals' schedules and priorities, others pop up unexpectedly as persons move through and react to their environments. For instance, if one witnesses an automobile accident while on the way to a car dealership to buy a car, this experience may catapult the goal of safety to the top of one's current concerns, influencing one's purchasing considerations and constraining one's choices.

In classic motivational research, the simultaneous presence of multiple goals has been identified as an approach–approach conflict (Hull,

1938; Lewin, 1935, 1951; Miller, 1944), whereby the individual needs to exercise a choice between two valuable end states. For example, a student who believes that it is his or her duty to be an "intellectual" but who also wishes to excel as an "athlete" may be conflicted between devoting time to physical training versus academic studies. In the words of Emmons, King, and Sheldon (1993), "implicit in self-regulated activity . . . is conflict" (p. 528).

Resolution of this type of conflict has typically been seen to involve a tradeoff, on the basis of the assumption that concomitance of multiple goals might tax one's available resources (Anderson et al., 2004; Baumeister, Bratslavsky, Muraven, & Tice, 1998; Shah, 2005; Shah, Brazeal, & Jungbluth, 2007). In such circumstances, the pursuit of one goal may be perceived as tantamount to sacrificing the other(s), as one cannot approach more than one goal at a time (Crocker & Park, 2004; Dhar, 1997; Ferraro, Shiv, & Bettman, 2005; Kuhl, 1984; Kuhl & Weiss, 1994; Van Hook & Higgins, 1988; Ward & Mann, 2000; Wertenbroch, 1998).

Yet, a very different option might exist that does not frame the situation in zero-sum terms. Such an option is to identify means that satisfy all the coactive goals at once. In fact, such a solution is related to a common manufacturing practice these days of equipping one's products with multiple features responsive to consumers' varied desires. The food industry, for example, has produced a large array of diet foods that promise to deliver taste while reducing one's caloric intake, allowing one to maintain (or acquire) a slim figure and enjoy one's food at the same time. Similarly, the fitness industry has developed energy-enhancing, muscle-building products that also promise to restore one's mineral balance without compromising on taste. And the electronics industry has managed to create sundry products equipped with a variety of features, such as cell phones that serve as cameras,

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Catalina Köpetz and Arie W. Kruglanski, Department of Psychology, University of Maryland, College Park; Tim Faber, Department of Psychology, University of Amsterdam, Amsterdam, the Netherlands; Ayelet Fishbach, Booth School of Business, Center for Decision Research, University of Chicago.

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Correspondence concerning this article should be addressed to Catalina Köpetz, Department of Psychology, University of Maryland, College Park, MD 20742. E-mail: cköpetz@psyc.umd.edu

computer terminals, personal calendars, and music players all in one (e.g., Apple's iPhone).

The examples above suggest that rather than giving up on some of their goals to deal with those situations where multiple goals are active, people may seek alternative strategies. It thus seems plausible that when confronted with multiple goals, people would seek *multifinal* means to promote their concurrent attainment, thus allowing them to "have their cake and eat it too" (Kruglanski et al., 2002). The present work aims to elucidate the nature of such a *multifinality quest* and to investigate its consequences and boundary conditions.

An Exclusionary Approach to Goal Conflict: Exercising Goal Choice

The notion that goal conflict is resolvable via choosing to pursue some goals and to sacrifice the others has appeared in different versions in the psychological literature. For instance, the concept of goal choice is implicit in the notion of *prioritization*, that is, focusing one's resources on the more important goals and withdrawing them (however temporarily) from alternative concerns (Cantor & Langston, 1989; Carver, 2004; Emmons & King, 1988; Higgins, 1997; Shah, 2005; Simon, 1967). Along these lines, Simon (1967) suggested that an actor who has many goals needs a way to rank them in order of importance and requires a mechanism for changing the rankings as necessary.

Kuhl (1984, 1986) outlined a different process responsible for the management of multiple goals via the choice mechanism, the phenomenon of *goal shielding*. According to this notion, for a goal-directed action to occur, the current guiding, or focal, goal has to be protected from competing goals (e.g., the goal of getting to class on time from the goal of making up the bed in the morning). Kuhl (1984, 1986) termed this shielding mechanism *action control* and differentiated among possible control strategies directed at one's attentional resources, emotional reactions, or environment. Shah, Friedman, and Kruglanski (2002) further investigated goal shielding and found that the activation of a given focal goal actually resulted in an inhibition of alternative goals, reflected in the slowing down of lexical decision times to word labels representing such goals.

A different type of choice mechanism underlies the notion of *satisficing*. Specifically, where clear prioritization of one's objectives appears difficult to establish, individuals may partially sacrifice each of several objectives without fully giving up on any one of them (Simon, 1967), hence, doing "a good enough job on each concern to deal with it satisfactorily" (Carver, 2004, p. 23). As goal theorists have noted, people may learn to balance multiple pursuits without becoming overly focused in any one way (Cantor, Acker, & Cook-Flannagan, 1992; Emmons & King, 1988). Somewhat similarly, others have suggested that when confronted with two goals, such as pleasure and good health, people may attempt to balance their choice of means to satisfy the goals (e.g., order a tasty but unhealthy appetizer followed by a healthy entree), involving a kind of satisficing (Dhar & Simonson, 1999; Fishbach & Dhar, 2005; Fishbach, Zhang, & Koo, 2009).

An Integrative Approach to Goal Conflict: The Quest for Multifinal Means

The possibility of giving up some of one's goals (even if partially or momentarily) may have negative consequences, par-

ticularly when the conflicting goals are enduring and self-defining (Wicklund & Gollwitzer, 1982), personal strivings (Emmons, 1989), or life tasks (Cantor, 1994). As Emmons and King (1988) observed, a conflict between personal strivings (i.e., power and intimacy goals) is often associated with poor well-being, as reflected in negative affect as well as in physical symptomatology.

Given such negative effects, people may take a very different approach to goal conflict that does not frame the situation in zero-sum terms. Indeed, Cantor and Fleeson (1994) suggested that perceived conflict between goals and their negative consequences may be reduced by recruiting one goal in the service of the other. For instance, one may balance the goal of doing well academically with other social goals by turning to close others for encouragement and reassurance when faced with obstacles and difficulties in academic life. Similarly, Emmons (1996) suggested that such negative effects of conflict may be reversed through a creative integration of separate goal strivings.

Similarly, research on choice and decision making (multiattribute utility theory) suggests that the attainment of several goals can be maximized through a tradeoff among different features that map onto different goals according to their predetermined weights (J. Baron, 2000; Keeney & Raiffa, 1976). In marketing and consumer psychology, this option became apparent in research on consideration set formation (Chakravarti & Janiszewski, 2003; Paulssen & Bagozzi, 2005). In this research, consumers' choice of different brands and products has been found to fluctuate depending on different goals that may be active at the moment. For instance, when the goal of optimizing the choice becomes salient, people consider more heterogeneous alternatives, whereas when the goal of simplifying the choice becomes salient, they restrict their options to the alternatives that appear more similar and are thus easier to compare (Chakravarti & Janiszewski, 2003). Similarly, Paulssen and Bagozzi (2005) found that consumers' choice was determined by the extent to which specific products satisfied not only a focal goal (e.g., a BMW satisfies the transportation goal) but also other macrolevel goals, such as the ideal self (e.g., power, social recognition).

To summarize, the research reviewed above identified two general principles that govern multiple-goal pursuit. First, the simultaneous presence of multiple goals creates goal competition/conflict that may have negative cognitive, affective, and behavioral consequences (Emmons & King, 1988). In such instances, effective self-regulation implies the need to exercise choice either by prioritizing and pursuing a single goal to completion while inhibiting (perhaps temporarily) competing alternatives or by partially giving up on each of several goals without completely sacrificing any one objective. Second, in response to multiple active goals, individuals may seek integrative alternatives; these are multifinal means that afford the simultaneous pursuit of several goals. Because multifinality concerns exemplify the simple rationality of maximizing the return on one's investments, or increasing the "bang for one's buck," the integrative quest for multifinal means where multiple goals are active may take precedence over the goal-choice process.

The Multifinality Constraints Effect

Though psychological researchers have recognized the ubiquitous presence of goal plurality in people's everyday pursuits, work

in this domain has not yet fully considered the consequences of seeking integrative solutions to multiple-goal problems. A major such consequence would be the narrowing of the means set to a current goal an actor would consider.

Consider for instance, the purchase of a car. Typically, this action culminates a multidimensional decision process involving a number of considerations. Though one's primary or focal goal in buying a car might be transportation, other objectives (e.g., securing an affordable price, an appealing design, smooth performance, trouble-free operation, safety) typically enter the picture as well. In seeking a car that fulfills these various requirements, individuals may be searching for a multifinal means to their relevant objectives. The more numerous one's requirements (i.e., the goals a car purchase is intended to meet), the more difficult and tortured the choice (i.e., the more picky and demanding one's behavior as a chooser will be). Thus, increasing the number of requirements should increase the difficulty of the search and reduce the set of satisfactory options (Bettman, Luce, & Payne, 1998; Dhar, 1996; Dhar & Simonson, 1999; Iyengar & Lepper, 2000; Luce, Payne, & Bettman, 1999; Tversky & Shafir, 1992). For instance, whereas all functioning cars provide transportation, fewer (though still quite a few) do so for an affordable price; fewer yet also please one's aesthetic tastes, offer safety, boast a stellar repair record, and so forth.

Intriguingly, such a narrowing of options may occur even when one is ostensibly pursuing a single focal goal with several active goals lurking in the background. Indeed, the major hypothesis of the present research is that the simultaneous activation of multiple goals will narrow the set of acceptable means to such a focal goal to means that would advance (or at least would not impede) the pursuit of additional objectives that happen to be active as well. Because multifinal means represent only a subset of the total means to a given focal goal, restricting one's attention to multifinal means should reduce the total number of means to the focal goal that one would consider. We label this phenomenon the *multifinality constraints effect*.

Two Boundary Conditions of the Multifinality Constraints Effect

To better understand the situations under which people may search for an integrative, multifinal solution versus exhibit a goal-choice approach, we explored two potential boundary conditions of the multifinality constraints effect: (a) the *feasibility* of identifying multifinal means and (b) the *enhanced importance* of the focal goal, resulting in the inhibition of the alternative objectives and, hence, a relaxation of the multifinality constraints. We consider these in turn.

Feasibility

Some goal groupings may appear to share numerous common means. This should increase the feasibility of identifying multifinal means and should reduce the extent to which searching for multifinal means would result in narrowing the means set to the focal goal. For instance, it might be easy to think of multiple ways to simultaneously attain the goals of losing weight and being in good shape (e.g., choosing a balanced diet and exercising regularly). On

the other hand, it may be rather difficult to envisage a way to do well in school and be a world-class athlete at the same time.

In line with these considerations, we hypothesized a curvilinear relation between the perceived feasibility of finding multifinal means and the degree to which alternative goals constrain the size of the means set serving the focal goal. Where the feasibility of finding multifinal means is either very high or very low (compared with moderate), constraints should be minimal: When feasibility is high, finding multifinal means should be easy, resulting in little (if any) appreciable reduction in means number. Furthermore, when feasibility is very low, individuals may quickly give up on the search for multifinal means. Instead, they may opt for exercising goal choice by inhibiting the alternative goal and limiting their concerns to the focal goal at hand. On the basis of this logic, the multifinality constraints effect should be more pronounced in a moderate-feasibility condition than in very high or very low feasibility conditions. Although the two latter conditions may be similar in terms of number of means, they are not similar in all respects, as only in the low (but not in the high) feasibility condition should the absence of the multifinality constraints effect be accompanied by goal choice, manifested in an inhibition of the alternative goals.

Focal Goal Importance

The second boundary condition on the multifinality constraints effect has to do with the relative importance (or value) of the focal goal compared with the alternative, background goals (Brunstein & Gollwitzer, 1996; Cantor & Kihlstrom, 1989; Emmons, 1986; Oettingen, Pak, & Schnetter, 2001). Shah et al. (2002) demonstrated that increased importance of the focal goal may produce goal shielding via inhibition of the alternate goals. Such inhibition should reduce the degree to which the alternative goals would constrain the means to the focal goal. In other words, increased importance of the focal goal should liberate the actor from taking the alternative goals into account, hence removing the necessity to search for multifinal means and allowing a full suite of means to the focal goal to be considered acceptable.

In summary, we have postulated that the simultaneous presence of several goals may induce a quest for multifinal means affording (or not impeding) the joint pursuit of the individual's coactive objectives. Multifinal means typically constitute a subset of the full array of means to a focal goal. Accordingly, activating additional goals should narrow the set of acceptable means to a focal objective to ones that benefit the active alternative goals as well. This narrowing effect should be especially strong when the alternative and focal goals are perceived to have only a few (as opposed to many, or no) means in common. Finally, because increasing the importance (or value) of the focal goal may inhibit the alternative goals (Shah et al., 2002), it should relax their multifinality constraints, allowing the full complement of means to the focal goal to be considered.

The Present Research

We explored these notions in five separate studies. Study 1 constituted a preliminary investigation designed to indicate whether a subtle reminder of goal alternatives would narrow the focal set of means for a current goal (of having lunch) to means

that would save time and hence allow those alternatives to be pursued. Study 2 explored the notion that restriction of the number of acceptable means would be reduced if the focal and alternative goals were perceived as potentially served by similar (multifinal) means. Studies 3–5 manipulated the relative importance of the focal goal across different goal types and operationalizations of importance and investigated the hypothesis that increased goal importance would lead to an inhibition of the alternative goal and hence relax its multifinality constraints; this should increase the set size of options seen as acceptable means to the focal goal.

Study 1

Study 1 constituted a preliminary investigation designed to test the hypothesis that the activation of additional goals would reduce the number of means considered acceptable to the pursuit of a given focal goal. As argued earlier, the notion of a multifinality quest implies such a reduction, on the basis of the rationale that only a subset of otherwise acceptable means would satisfy the multifinality constraints imposed by the alternative goals.

Method

Participants. Thirty-eight University of Maryland students were approached at the Student Union in College Park during the lunch hour and were asked to fill out a survey on “students’ eating habits.” All our participants were volunteers, and, unsurprisingly, they all reported the goal of getting lunch as their reason for being at the Student Union at that particular time. Accordingly, we identified “getting lunch” as our participants’ focal goal at the time and place at which we approached them.

Food pretesting. We conducted extensive pretesting of students’ food preferences and of the availability of such foods at the campus food court in order to identify foods that were highly desirable and readily available for students. Specifically, we asked 49 University of Maryland students, during lunch time (1–2 p.m.), to list the foods they wanted for lunch and to rate how easily (1 = *not easily at all* to 9 = *very easily*) and how quickly (1 = *not quickly at all* to 9 = *very quickly*) they could get them at the food court in the Student Union. In response, our participants listed 28 distinct food categories (e.g., pizza, pasta, salad, sushi, and pancakes). Because the ratings of ease and quickness were highly correlated for each of the foods ($r_s = .73$ to $.94$, $p < .05$), we combined these two measures for each item. We then selected the 10 foods that scored the highest on the easiness/quickness scale (above 5 on the 1–9 scale) to represent our “easy to get” foods and the 10 foods that scored the lowest (below 3.5 on the 1–9 scale) to represent our “hard to get” foods.

Procedure. The study employed a 2 (goals: completed vs. uncompleted) \times 2 (foods: easy to get vs. hard to get) mixed design, with goals varying between subjects and foods varying within subject. Participants were first asked to rate how hungry they were (1 = *not hungry at all* to 9 = *very hungry*). We then activated participants’ alternative goals. In our uncompleted goals condition, participants were asked to list three activities they had planned for the rest of that day. In the completed goals condition, participants were asked to list three activities that they had already accomplished that day. We assumed that the latter activities corresponded to goals that had lost their driving potential or, in

Lewinian terms, had had their *tension system* drained. Participants in both conditions listed similar activities, such as “going to class/had a class,” “exercising in the gym/went to the gym,” “washing my car/drove to school,” and “studying for a quiz/went to the library.” Participants were then asked to choose the foods they desired for lunch from a list of 20 foods. According to the pretest described above, 10 of these foods were generally readily available at the food court where we ran the study (e.g., Chinese food, tacos, fries), whereas the remaining 10 were foods considered to be unavailable at the food court, though available at other campus locations (e.g., salmon, macaroni and cheese, crab cakes). We assumed that easy to get foods would be multifinal in that choosing them would help participants to fulfill their focal goal (of having lunch) and also save time for alternative goals they had planned for the day.

Results

Our first analysis established that participants did not differ in terms of reported hunger between the two conditions ($F < 1$). The total number of foods each participant selected was analyzed as a function of goal (completed vs. uncompleted) and type of food (easy to get vs. hard to get). An analysis of variance (ANOVA) on this variable yielded a significant main effect of goal. Specifically, participants in the uncompleted goals condition selected fewer foods ($M = 5.15$, $SD = 2.43$) than did their counterparts in the completed goals condition ($M = 8.31$, $SD = 4.49$), $F(1, 36) = 7.24$, $p = .01$. Of greater interest for the current theorizing is the interaction between food and goal, $F(1, 36) = 4.38$, $p < .05$. Participants in the uncompleted goals condition were more selective, as they chose a higher number of easy ($M = 3.57$, $SD = 2.06$) versus hard to get foods ($M = 1.57$, $SD = 1.16$), $t(18) = 3.77$, $p < .01$. By contrast, participants in the completed goals condition did not show a significant preference for easy over hard to get foods ($M = 4.36$, $SD = 2.31$ vs. $M = 3.94$, $SD = 2.73$; $t < 1$; see Figure 1).

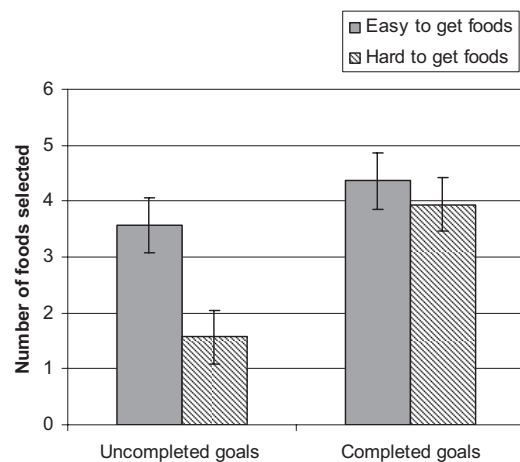


Figure 1. Number of easy to get foods versus hard to get foods selected as means to the focal goal of having lunch, as a function of the alternative goals prime (Study 1). Error bars represent 1 standard error of the mean.

Discussion

The results of Study 1 support our basic prediction that the presence of alternative goals may restrict the set of acceptable means for a focal goal to those means that also afford (or at least do not hamper) the pursuit of other active goals. Our participants whose focal goal was to get lunch showed an interest in fewer foods when they were reminded of other activities they had planned for the day than when they were reminded of activities they had already accomplished that day. Furthermore, when participants thought about their uncompleted (vs. completed) goals, they indicated a preference for easy to get foods over hard to get foods. The latter preference seems to reflect a search for a multifinal solution that would enable participants to attain their focal goal (i.e., to have lunch) while also leaving time for alternative goals they intended to accomplish.

We assumed that participants in both conditions would have been equally busy, as they were assigned randomly to the completed and uncompleted goals conditions. Therefore, it is rather unlikely that participants in the uncompleted but not those in the completed goals condition would have had a different number of future goals for the day that could have impacted their choice. The difference between them resided in the fact that in the uncompleted (but not in the completed) goals condition, participants had their impending goals activated. This presumably instigated participants' quest for multifinal means, producing the hypothesized multifinality constraints effect.

In general, the multifinality constraints effect may serve an important self-regulatory function, as it assures a better overall outcome (a bigger "bang for one's [investment] buck") in which neither goal alternative is abandoned. However, its appearance may be subject to a number of boundary conditions. One such condition pertains to the feasibility of identifying multifinal means for goals that happen to be active at the time. Our next study was designed to investigate this particular moderator of the multifinality constraints effect.

Study 2

Our second study investigated the feasibility of finding multifinal means as a possible boundary condition for the multifinality constraints effect. As reasoned earlier, some goals do share a high number of common means, which presumably increases the feasibility of selecting them when the goals are simultaneously active. Up to a point, the feasibility of finding multifinal means should be inversely related to the multifinality constraints effect: The more feasible it is to find multifinal means, the less the reduction in the number of focal means occasioned by the presence of the alternative goals should be. In other words, as one moves from high to moderate feasibility (of finding common means), the relation between feasibility and the multifinality constraints effect should be negative.

However, if the focal and the alternative goals seem to share no common means whatsoever, the individual might view the multifinality quest as futile. In such circumstances, instead of attempting to identify common means, the individual might opt to exercise goal choice by inhibiting the alternative goal and directing his or her exclusive attention to the focal goal (Shah et al., 2002). Such a process should liberate the individual from the impact of the

alternative goal, eliminating the multifinality constraints effect. In other words, in the segment of the feasibility continuum ranging from the somewhat feasible to the completely unfeasible domains, the multifinality constraints effect should vary positively with feasibility. Thus, the number of acceptable means to the focal goal should be lower in the somewhat feasible condition, when the focal and alternative goals are seen as somewhat related, than in the completely unfeasible condition. If the preceding analysis is valid, the relation between feasibility and the multifinality constraints effect should be curvilinear; it should exhibit a negative relation between feasibility up to a point, beyond which this relation should become positive.

In the present study we manipulated the feasibility of finding multifinal means by subliminally priming an alternative goal that varied in the number of means it shared with the focal goal. In the high-feasibility condition, the number of commonly shared means was high; in the moderate-feasibility condition, it was intermediate; and in the low-feasibility condition, it was low. We subsequently assessed the number of means (activities) that participants chose as acceptable with regard to the focal goal. We also examined the possibility that when the feasibility of finding multifinal means is low, a goal choice will take place, whereby people will focus their attention entirely on the focal goal and inhibit the alternative goal. To test this hypothesis, we measured the level of activation of the alternative goal.

Method

Pretesting the stimulus materials. We first conducted a pretest in order to identify alternative goals that were commonly pursued by a majority of students at the University of Maryland and that varied in the degree to which they shared means with the goal of "being healthy," which was treated as the focal goal. In this pretest, we asked 40 students whether being healthy was a goal that they were actively trying to attain and how important this goal was to them. Participants were then asked to list three other goals that they were planning to accomplish in the near future. Participants were specifically instructed to list one goal that shared a lot of common means with the focal goal of being healthy, another goal that shared a few common means with the focal goal, and a third goal that shared no common means with the focal goal. Finally, we asked our participants to list all the activities one could engage in to maintain good health (i.e., defined as means to the focal goal).

A majority of our participants listed "being in shape" as a goal that shared many means with health, "doing well in school" as a goal that shared few means with health, and "drinking alcohol" as a goal that shared no means whatsoever with the health goal. Our participants also generated 30 activities as means to the goal of being healthy including "avoiding drugs," "staying focused," "attending the gym," "sleeping well," "eating well," and so forth. A separate group of 30 participants evaluated the instrumentality of these means (activities) to each of the four goals on 7-point scales (1 = *not instrumental at all* to 7 = *very instrumental*). We then looked at the number of means whose perceived instrumentality fell above the midpoint of the scale. Not surprisingly, all the means were evaluated as relatively useful with regard to the goal of being healthy, exceeding the midpoint of the scale ($M = 5.13$, $SD = 0.68$). Twenty-nine of the 30 means generated were evaluated as also instrumental to the goal of being in shape ($M = 5.00$, $SD =$

0.67), whereas only 20 means were evaluated as instrumental to the goal of doing well in school ($M = 4.90$, $SD = 1.18$). Unsurprisingly, none of the means generated with respect to the goal of being healthy was perceived as instrumental to the goal of drinking alcohol ($M = 2.54$, $SD = 0.92$). As instructed then, the high-feasibility goal that participants listed (being in shape) appeared to share a high number of means with the focal goal; the moderate-feasibility goal (doing well in school) shared a lower number of common means with the focal goal; and the low-feasibility goal (drinking alcohol) shared no common means at all with the focal goal.¹

Participants. One hundred four University of Maryland students participated in this study in exchange for course credit.

Manipulation of feasibility and means choice. On the basis of the exploratory findings presented above, in this study we first introduced the focal goal of “being healthy.” To this end, participants were asked to rate the importance of being healthy for themselves and for others (1 = *not important at all* to 7 = *very important*) and the extent to which they were actively engaged in the pursuit of this goal (1 = *not at all* to 7 = *a lot*). Participants scored above the midpoint of the scale on all three ratings, that is, importance for themselves ($M = 5.76$, $SD = 0.90$), for others ($M = 5.67$, $SD = 0.80$), and pursuit of the goal ($M = 5.12$, $SD = 1.08$). Moreover, their ratings did not differ across conditions ($F_s < 1$). On the basis of these ratings, we could therefore ascertain that our participants found the focal goal to be important and were actively pursuing it.

After this initial round of ratings, we introduced our independent variable, the feasibility of finding multifinal means, by subliminally priming the alternative goal in three experimental conditions. In the high-feasibility condition, the prime consisted of being in shape; in the moderate-feasibility condition, the prime consisted of doing well in school; and in the low-feasibility condition, the prime consisted of drinking alcohol. We also included a control condition in which no alternative goal was primed. We assumed that this condition would yield a baseline number of means that participants may generate to the focal goal when no alternative goal is simultaneously active.

While being primed with the alternative goal, our participants were presented with the list of 30 activities generated during the pretest as means to the focal goal of being healthy and were asked to select those activities in which they were currently engaged and/or they were planning to engage in the near future. The number of activities selected defined our dependent variable. The priming of the alternative goal and the choice of the means with regard to the focal goal were accomplished via a sequential priming task (see Shah et al., 2002, for a similar procedure). Specifically, we asked our participants to judge whether a target stimulus represented an activity that they were currently pursuing or planning to pursue in the near future. Each target was preceded by a subliminal prime. There were 30 primes consisting either of words representing the alternative goal in each of the three experimental conditions or of neutral words in the control condition. For instance, we primed *shape*, *figure*, and *exercise* for the alternative goal of being in shape; *school*, *grades*, and *exam* for the alternative goal of doing well in school; and *drink*, *alcohol*, and *party* for the alternative goal of drinking alcohol. In the control condition, the primes included neutral words such as *table* and *chair*. We ensured that the primed words were relatively equal in length and

frequency in the active vocabulary. The targets consisted of the 30 activities generated as means toward the focal goal of being healthy during the pretest. All the activities were phrased in two- to three-word phrases, such as *stay focused*, *sleep well*, *follow a balanced diet*, *be self-disciplined*, and so forth.

The prime word appeared in white at the center of a black screen for 40 ms and was immediately forward and backward masked to ensure that it did not reach the threshold of conscious awareness (Bargh & Chartrand, 2000). After 700 ms the mask was in turn replaced by the target representing an activity (a means), and participants were instructed to press Z if they were not currently pursuing/planning to pursue the activity or to press the forward slash key if they were currently pursuing/planning to pursue that activity. The 740-ms interval between the prime and target onsets defines the stimulus onset asynchrony (SOA; Neely, 1977).

We based our procedure on the notion that goal-relevant knowledge should be more accessible upon the activation of a particular goal (Aarts, Dijksterhuis, & De Vries, 2001; Bruner & Postman, 1948; Ferguson, Hassin, & Bargh, 2008; Sherman, Rose, Koch, Presson, & Chassin, 2003). As Ferguson et al. (2008) noted, “a perceiver’s current goals provide limitations and constraints on the types of knowledge accessible in memory, and this drives the perceiver’s attention toward certain elements within the environment” (p. 158). We therefore assumed that activation of the focal and the alternative goals would render more accessible the means perceived as instrumental to those goals, which would hence become more likely to be chosen by our participants as activities they were currently engaged in. After this task, and before we measured the inhibition of the alternative goal, participants completed a filler task.

Inhibition of the alternative goal. Finally, participants completed a lexical decision task to assess the accessibility of the alternative goal corresponding to each condition, after being primed with the focal goal or with neutral words. The task consisted of 120 trials presented in a random order. In 30 of these trials, participants responded to targets representing participants’ alternative goal (e.g., *school*) after being primed with words related to the focal goal of health (e.g., *health*, *wellness*) or neutral words (e.g., *chair*, *cartoon*). To control for the possibility that

¹ One may argue that the three goals generated by our participants and subsequently used to manipulate feasibility differed in their abstractness, and the question is whether this might impact the level of perceived intergoal conflict. From a theoretical point of view, goals can be distinguished in terms of their level of abstractness only within a given goal system where they are interconnected hierarchically, with the less abstract goals serving the more abstract goals. Such vertical connections are typically facilitatory rather than inhibitory and thus conflictual. Thus, within a given goal system, or a given goal hierarchy, conflict can occur between goals or means at a given level of the hierarchy but not between levels (Kruglanski et al., 2002). Goal conflict is more likely to occur when different goal systems are simultaneously activated and compete for limited resources. But, in contrast to hierarchical levels within a given goal system, goals from different goal systems (or different goal hierarchies) cannot meaningfully be distinguished in their levels of abstractness. The present sets of goals our participants generated do not lend themselves to a neat ordering within specific abstraction hierarchies, so the concern that the degree of goal conflict differed for different participants and that this affected means generation in a manner that competes with the present analysis does not seem particularly warranted.

intergoal inhibition may have occurred as a result of differences in the goal content, rather than as a consequence of the feasibility of finding common means across conditions, we included an additional 60 trials where participants responded to target words related to the alternative goal (corresponding to the other experimental conditions) after being primed with words related to the focal goal of health or neutral words. For example, in addition to responding to the words associated with the alternative goal of being in shape, participants in the high-feasibility condition also responded to target words related to school and alcohol. Similarly, participants in the moderate-feasibility condition responded not only to words associated with the alternative goal of doing well in school but also to words related to being in shape and alcohol. This ensured that participants responded to the same targets, regardless of the experimental condition to which they were assigned. The remaining 30 trials consisted of neutral primes and neutral and nonword targets to assess participants' baseline reaction time. On none of the trials did the same word appear as both a prime and a target.

At the beginning of each trial, a fixation point ("X") appeared in the center of the screen for 2 s to indicate to participants where to focus their attention. The fixation point was then replaced by a prime word for 50 ms, backward and forward masked. The mask was in turn replaced by a target word, and participants were instructed to decide as quickly as possible whether the targets represented words or nonwords. Again, the SOA was 750 ms. The relatively long prime duration and SOA were intended to increase our power to detect a priming effect by allowing both increased processing time for the prime and increased time for inhibitory processes to come into play (for a similar discussion, see Fishbach, Friedman, & Kruglanski, 2003). The assumption underlying this task was that priming participants with their focal goal would affect the accessibility of the alternative goal, as indicated by slower reaction times to words representing the latter (Shah et al., 2002).

Finally, we administered a modified funnel-type debriefing procedure (Bargh & Chartrand, 2000) to ascertain that our priming procedures were indeed subliminal. Although some participants reported having seen words flashing during the priming procedures, none reported being able to actually identify these words.

Results

Reduction in the number of means. A one-way ANOVA that analyzed the effect of feasibility on the number of means/activities selected by participants in each condition yielded a main effect, $F(3, 100) = 20.33, p < .01$. As revealed by the predicted contrasts of interest, compared with the control condition where no alternative goal was activated, participants in the moderate-feasibility condition selected fewer means/activities, thus showing the multifinality constraints effect ($M = 22.46, SD = 2.08$ vs. $M = 18.45, SD = 2.55$), $t(100) = 6.95, p < .01$. By contrast, the number of means selected by the participants in both the high- ($M = 22.21, SD = 1.81$) and low-feasibility ($M = 21.46, SD = 1.63$) conditions was not significantly different from that in the control condition, $t < 1$ and $t(100) = 1.77, p = .08$, respectively. Furthermore, participants in high- and low-feasibility conditions did not differ in terms of number of means they selected, $t(100) = 1.35, p = .17$. These results are summarized in Figure 2.

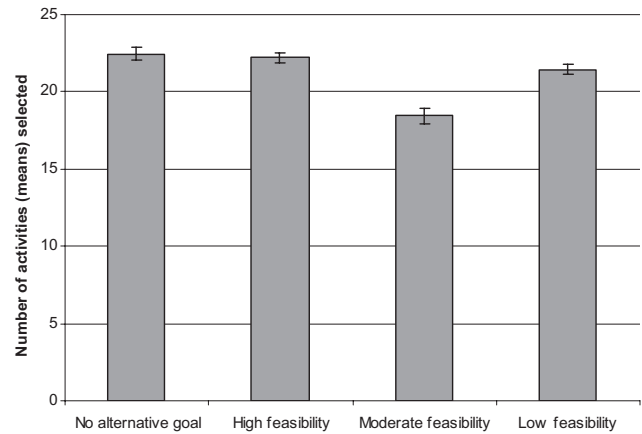


Figure 2. Number of activities (means) selected with regard to the focal goal of being healthy, as a function of the feasibility of finding multifunctional means (Study 2). Error bars represent standard error of the mean.

Multifinality of the means. So far, the results indicate that the number of selected means to the focal goal depends on the presence of an alternative goal and the feasibility of finding common means to the focal and the alternative goals. To explore the possibility that such a selection reflects a multifinality quest, we next looked at the perceived instrumentality of the selected means with regard to the alternative goal in our three experimental conditions. Because there was no alternative goal in the control condition, we excluded participants in this condition from further analyses.

On the basis of the pretest evaluation, for each participant we first computed an average score representing perceived instrumentality of the selected means with regard to the corresponding alternative goal. The means and the standard deviations corresponding to this variable are presented in Table 1. A one-way ANOVA revealed an overall effect of feasibility on the perceived instrumentality of the means with regard to the alternative goal, $F(2, 75) = 42.54, p < .01$. Interestingly, although we observed a reduction in the number of means with regard to the focal goal of health when the alternative goal shared few means in common (in the moderate-feasibility condition) versus many means in common with this goal (in the high-feasibility condition), there was no significant difference between these two conditions in the perceived instrumentality of the means with regard to the alternative goal, $t(75) = 1.67, p = .09$. This finding is consistent with the notion that the reduction in the number of means selected to the focal goal was motivated by a multifinality quest of finding means that are instrumental with respect to both the focal and alternative goals.

Also consistent with this interpretation was the difference between the perceived instrumentality of means to the alternative goal by participants in the low-feasibility condition compared with those in both the moderate- and the high-feasibility conditions. Specifically, though the number of selected means to the focal goal was greater in the low-feasibility versus moderate- feasibility condition, the instrumentality of the means to the alternative goal was greater in the latter than the former condition, $t(75) = 6.81, p < .01$. Furthermore, although participants in both the high- and

low-feasibility conditions selected a similar number of means, in the low-feasibility condition these means were less instrumental to the alternative goal than in the high-feasibility condition, $t(75) = 8.78, p < .01$. This finding suggests that when the feasibility of finding common means is very low, participants may give up on the multifinality quest and select focal means without regard to the alternative goal being primed.

Intergoal inhibition. We additionally hypothesized that where the feasibility of finding common means is low, participants may execute a goal choice by inhibiting the alternative goal altogether. To explore this possibility, we calculated an average of participants' lexical decision times to words related to their alternative goal after being primed with the focal goal. Because the latency of incorrect responses would be difficult to interpret in terms of inhibitory strength, only correct responses were used in our analyses (Fazio, 1990).

To control for the general accessibility of the alternative goals, we averaged participants' reaction times to their alternative goal after being primed with neutral words. We assumed that slower reaction times to the alternative goal after being primed with the focal goal versus a neutral prime would indicate that the focal goal had resulted in an inhibition of the alternative goal (see Shah et al., 2002, for a similar procedure). Finally, to get a baseline reaction time and to control for the differences in alternative goals across conditions, we calculated participants' average reaction times to neutral words, nonwords, and the alternative goals for the other nonassigned experimental conditions after presenting them with a focal goal or a neutral prime.

We then performed a repeated-measures ANOVA on participants' average reaction time to the alternative goal when the focal goal served as prime versus when a neutral word served as prime, while simultaneously controlling for (covarying out) their baseline reaction time.² As illustrated in Figure 3, an inhibition of the alternative goal appears to have occurred, but only when the alternative goal (drinking alcohol) did not share means with the focal health goal, $F(2, 74) = 8.03, p < .01$. Specifically, after controlling for the baseline reaction, participants in this condition responded more slowly to the alternative goal after being primed with the focal health goal than after being primed with a neutral prime, $F(1, 24) = 5.74, p < .05$. By contrast, participants in the remaining two conditions did not display such an inhibitory effect. Indeed, participants in the doing well in school condition responded as fast to their alternative goal after being primed with the focal goal as they did after being primed with a neutral prime ($F < 1$), whereas in the being in shape condition, participants showed a trend in the opposite direction. Specifically, they responded

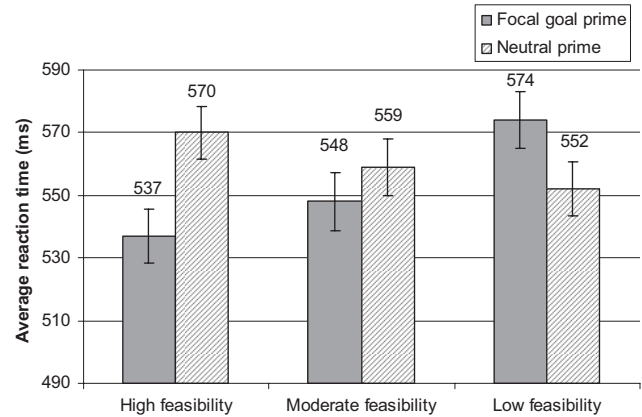


Figure 3. Participants' lexical decision times for alternative goal targets when primed with the focal goal or with a neutral word (Study 2). Error bars represent standard error of the mean.

slightly faster to the alternative goal after being primed with a focal goal versus a neutral prime, $F(1, 26) = 3.77, p = .06$.

Discussion

In summary, the findings of Study 2 replicate and extend those of Study 1. In the present study too, the introduction of an alternative goal reduced the number of means to the focal goal. Of particular interest, the extent of such reduction depended on the feasibility of finding means that would allow the simultaneous pursuit of both goals. Specifically, when feasibility was high, because the goals were perceived to share numerous common means, no restriction in the number of focal means was observed. By contrast, when feasibility was only moderate, because the two goals shared fewer (though still some) means in common, a substantial reduction in the number of selected focal means took place, such that the means selected with regard to the focal health goal were those activities that appeared to serve the background goal of doing well in school as well. Finally, when a background goal shared essentially no means in common with the focal goal and it was therefore unfeasible to find such means, participants were less selective with regard to the means/activities that they chose. In fact, in this low-feasibility condition, hardly any restriction was observed in the number of means selected with regard to the focal goal. Moreover, the selected means in this condition were not instrumental with regard to the alternative goal of drinking alcohol. Finally, participants appeared to have shielded the focal goal by inhibiting the alternative, lower order goal (consistent with the findings of Fishbach et al., 2003; Shah et al., 2002).

Generally speaking, the results of Studies 1 and 2 are consistent with the notion that a quest for multifinality may take place when people attempt to pursue a background goal in addition to the focal goal. Study 2 has also indicated that one boundary condition of such a quest has to do with its feasibility and that a curvilinear relation appears to exist between feasibility and the multifinality

Table 1
Means and Standard Deviations for Perceived Instrumentality of the Activities Selected With Regard to the Alternative Goal as a Function of Feasibility

Feasibility	M	SD	N
High	4.75	0.45	28
Moderate	4.55	0.22	24
Low	3.73	0.52	26

² A preliminary analysis indicated that our independent variable did not have any effect on the covariate. An analysis of covariance (ANCOVA) was therefore deemed appropriate to test our hypothesis.

constraints effect of reduction of the set size of means (generated or selected) for the pursuit of a given focal goal.

Our last set of studies aimed to explore a second boundary condition of the multifinality constraints effect, namely, the importance of the focal goal. We assumed that a highly important focal goal should inhibit the alternative goals (Shah et al., 2002) and therefore reduce the impact of alternative goals on the choice of means, attenuating the multifinality constraints effect.

Study 3

Whereas our former studies kept the focal goal constant and manipulated the presence or type of the alternative goal, the next studies held the alternative goal constant and varied the importance of the focal goal. Specifically, in Study 3, we looked at participants' choice of foods during lunch time. Previous research has shown that the regulation of eating behavior often involves two goals, the goal of food enjoyment and the goal of weight control (Stroebe, Mensink, Aarts, Schut, & Kruglanski, 2008). We assumed that when both goals were equally important, we would observe a quest for multifinal means whereby people would restrict their choice of foods to those that are tasty but also low in caloric content, therefore instrumental to goals of both food enjoyment and weight control. However, when the goal of food enjoyment becomes relatively more important, people may forego their weight control concerns and expand their means set size to include all possible means/foods instrumental to their more important goal, regardless of their instrumentality to the alternative goal.

To test these notions, we manipulated the importance of food enjoyment through a modified mental contrasting procedure (Oettingen, 2000; Oettingen et al., 2001) during lunch time. We then asked participants to list the foods that they wanted for lunch as means to satisfy their goals, and we looked at the number and instrumentality of the foods to each goal as a function of goal importance.

Method

Participants. Thirty participants were approached at the University of Maryland Student Union during the lunch hour and were asked to fill out an "eating behavior questionnaire." Two of them reported that they had already had lunch and were therefore excluded from our final sample, leaving us with 28 participants.

Procedure. In order to attest the presence of the food enjoyment and weight control goals, participants were first asked to rate (a) to what extent they chose foods based on their taste and regardless of their caloric content and (b) to what extent they chose foods based on their caloric content regardless of their taste (1 = *not at all* to 9 = *very much*). These questions were presented together with three additional questions regarding participants' eating behavior. Specifically, they were asked how much money they spent on groceries, how often they cooked for themselves, and whether they had had breakfast that morning. These last three questions were asked only to divert participants' attention from our interest in the food enjoyment and weight control goals and were not included in further analyses.

We next introduced our manipulation through a modified version of the mental contrasting procedure. Specifically, in the high

importance of food enjoyment condition, we asked participants to list three advantages and three disadvantages of choosing tasty/palatable foods. Based on the assumption that contrasting the desirability of goal pursuit with its negative aspects would induce a state of cognitive dissonance, this procedure has often been found to increase goal importance and commitment (Oettingen, 2000; Oettingen et al., 2001), presumably in an effort to reduce dissonance. In the control condition, participants were asked to list three advantages of choosing tasty/palatable foods as well as three advantages of choosing low-caloric foods. Unlike the contrasting procedure, thinking only about the advantages of goal pursuit presumably allowed both goals to be activated to the same extent while keeping their relative importance constant. Finally, participants were asked to list the foods that they desired to have for lunch. The number of foods listed represented our main dependent variable.

To assess to what extent the foods listed would represent instrumental means to each of the two goals of interest, we asked two external raters to evaluate the tastiness and the caloric content of each food listed by our participants on 9-point scales (1 = *not at all tasty/low caloric* to 9 = *very tasty/high caloric*). The two sets of ratings were correlated for both food tastiness ($r = .51, p < .01$) and its caloric content ($r = .83, p < .01$). We therefore averaged these ratings and computed two separate scores for each participant representing the extent to which the foods chosen were perceived as instrumental means to the food enjoyment and the weight control goals, respectively.

Results

Our first analysis confirmed that both goals of food enjoyment and weight control were equally considered by our participants regardless of the experimental condition. Specifically, in both the high importance of food enjoyment and control conditions, participants reported that when they chose foods they considered taste ($M = 4.42, SD = 2.06$ vs. $M = 5.07, SD = 1.52$) and caloric content ($M = 5.28, SD = 1.68$ vs. $M = 5.57, SD = 1.69$) to a similar extent ($F_s < 1$).

We subsequently looked at the number of foods participants listed as a function of our manipulation of goal importance. As predicted, participants in the high importance of food enjoyment condition listed more means ($M = 7.64, SD = 2.81$) than did participants in the control condition ($M = 5.14, SD = 2.47$), $F(1, 26) = 6.21, p = .01$. These results offer preliminary support for our main hypothesis. Compared with the situation where multiple goals are simultaneously active and may therefore restrict one's choices to the multifinal means, high goal importance results in a reexpansion of the means set size.

To further explore this hypothesis, we looked at the extent to which the means (foods) listed by our participants were perceived to be instrumental to each of the two goals of interest. If our hypothesis is correct, in the control condition where both food enjoyment and weight control were presumably equally important, we should observe a restriction of food choice to foods that are equally tasty and of low caloric content and, therefore, that are instrumental to both goals. By contrast, in the experimental condition where the importance of food enjoyment was experimentally enhanced, participants should list foods that are significantly tastier than low in caloric content. To test this hypothesis, we

analyzed perceived means instrumentality (tastiness vs. caloric content) as a function of goal importance. As expected, an interaction emerged between food instrumentality and goal importance, $F(1, 26) = 10.88, p < .01$. Participants in the high importance of food enjoyment condition listed foods that were perceived to be tastier ($M = 4.24, SD = 0.46$) than low caloric ($M = 2.73, SD = 0.69$), $t(13) = 7.96, p < .01$. By contrast, in the control condition, participants' food choice reflected their simultaneous concern for food tastiness and caloric content, as they listed foods that were equally tasty ($M = 3.42, SD = 0.56$) and low caloric ($M = 2.97, SD = 0.75$), $t(13) = 1.76, p = .10$ (see Figure 4).

Discussion

To conclude, Study 3 provides initial evidence that increased goal importance may limit the quest for multifinal means, as reflected in the number and instrumentality of the means that our participants listed. Specifically, when both the food enjoyment and the weight control goals were presumably equally important, a multifinal quest appears to have taken place, as our participants restricted their food choice to those foods that would simultaneously satisfy both goals. In contrast, when the goal of food enjoyment became relatively more important than the weight control goal, participants listed more foods, and those foods were perceived as more instrumental to the more important goal than to the alternative one. In our next study we aimed to replicate these results using a more direct manipulation of goal value, through an evaluative conditioning procedure, as well as a different operationalization of means selection.

Study 4

Similar to the previous study, the current study too investigated participants' food choice during lunch time as a function of the relative importance or value of the food enjoyment goal compared

with the weight control goal. To this aim we used an evaluative conditioning procedure to increase the value/importance of the food enjoyment goal. Evaluative conditioning refers to the changes in the valence of a stimulus through its association with another positively or negatively valenced stimulus (De Houwer, Thomas, & Baeyens, 2001). Previous research has shown that unobtrusively associating behavioral states to positive, compared with neutral or negative, affect provokes immediate goal-directed behavior, reflecting enhanced motivation to accomplish these states. In that research, participants demonstrated increased desire to pursue these states and worked harder on the tasks that were instrumental in attaining them (Custers & Aarts, 2005).

In an adaptation of the evaluative conditioning paradigm, participants in the current study were provided with a dot detection task (see Custers & Aarts, 2005, for a similar procedure) that required them to focus on the computer screen. To increase the relative value of the food enjoyment goal, in one condition, unbeknownst to the participants, we subliminally primed food enjoyment words (e.g., *taste*) followed by positive adjectives presented supraliminally. In a control condition, designed to keep the value of both goals relatively equal, food enjoyment and weight control words (e.g., *taste* and *diet*, respectively) were both associated with positive adjectives. As a measure of means choice, participants selected the foods that they desired for lunch from a list of 20 foods preselected to be instrumental only to the food enjoyment goal or to both goals at the same time. We expected that when both goals were equally important, a multifinality constraints effect would take place whereby participants would restrict their food choice to the foods that were tasty but also low in calories (multifinal means). However, when the goal of food enjoyment was relatively more important than the goal of weight control, we predicted that no multifinality constraints effect would be observed. In this case, participants would expand their means choice to include more foods that were instrumental to the food enjoyment goal regardless of their caloric content.

Method

Participants. Forty-nine University of Maryland undergraduate students were invited to participate in the study in exchange for course credit. Eleven of them reported that they had already had lunch and were therefore excluded from the study, leaving us with a sample of 38 participants.

Procedure. Similar to in Study 3, participants were first presented with a set of ratings whose purpose was to attest the presence of the two goals of interest, food enjoyment and weight control.

We then introduced the evaluative conditioning procedure designed to manipulate the value of the food enjoyment goal as a "dot identification" task. The task consisted of 80 trials. At the beginning of each trial, a fixation point ("X") appeared in the center of the screen for 2 s to indicate to participants where to focus their attention. The fixation point was then replaced by a prime word for 23 ms, backward and forward masked. In the high importance/value of food enjoyment condition, the prime word was *taste*. In the control condition, where both goals were presumably equally important, the prime word was *taste* in one half of the trials and *diet* in the remaining half of the trials. The mask was in turn replaced by a positively valenced or neutral target word that

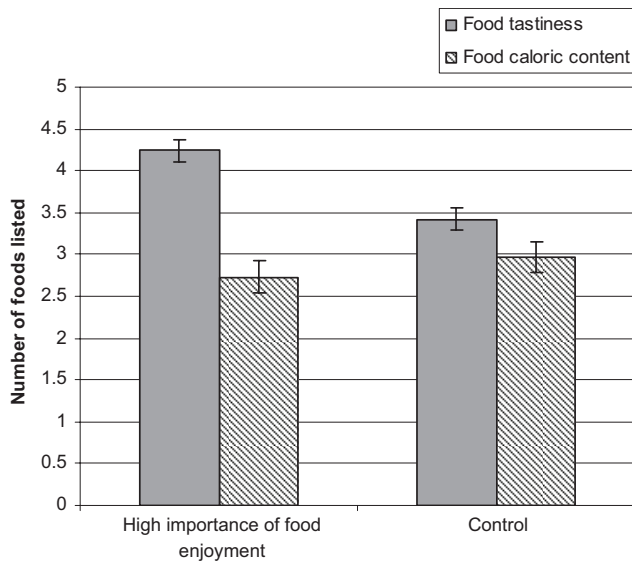


Figure 4. Number of foods selected as a function of the importance of the goal of food enjoyment (Study 3). Error bars represent standard error of the mean.

was presented for 150 ms. We introduced neutral words in 20 of the trials to reduce any possible suspicion regarding the nature of our target words. Finally, 23 ms after the word had disappeared, a red dot was randomly presented for 23 ms in half of the trials. The type of prime, target, and the presence of the dot were randomly selected. The time between pairings was 2,500 ms. Participants were instructed to count the number of red dots that would appear briefly on the screen. They were also told that, in order to make the task more complex, different words would be presented on the screen and that the dots might appear above and below these words. In actuality, this feature of the procedure ensured that the participants were paying attention to the entire screen during the affective conditioning phase.

Finally, participants were provided with a list of 20 foods and asked to choose the foods that they would like for lunch. The foods were preselected from a pool of 35 foods generated by our participants in Study 3. Specifically, each of these foods was rated by two external raters in terms of its tastiness (1 = *not tasty at all* to 5 = *very tasty*) and caloric content (1 = *not low caloric at all* to 5 = *very low caloric*). The two sets of ratings correlated for both food tastiness, $r(35) = .77, p < .01$, and caloric content, $r(35) = .71, p < .01$, and we therefore averaged them to create a single score for tastiness and caloric content. We then selected 20 foods, of which 10 were rated to be tastier ($M = 4.53, SD = 0.35$) than low caloric ($M = 1.70, SD = 0.69$), $t(9) = 13.34, p < .01$, and which were therefore instrumental to the food enjoyment goal but not to the weight control goal. The remaining 10 foods were equally tasty and low caloric ($M = 3.86, SD = 0.61$ vs. $M = 4.23, SD = 0.41; t < 1$). We treated these foods as multifinal means because selecting them would satisfy both goals (of tastiness and weight control) simultaneously.

After the means selection procedure, we administered a modified funnel-type debriefing procedure (Bargh & Chartrand, 2000) to ascertain that participants did not detect the subliminal primes and were not aware of the purpose and nature of our evaluative conditioning procedure. No participant reported having seen the words being primed. Although some participants were aware that some of our target words were adjectives, none of them guessed the actual purpose of the task.

Results

The first set of analyses attested to the presence of both goals of food enjoyment and weight control in participants' food choice. Regardless of experimental condition, participants reported that, when choosing foods, taste ($M = 5.94, SD = 2.06$ vs. $M = 6.36, SD = 1.06$) and caloric content ($M = 4.10, SD = 2.02$ vs. $M = 4.15, SD = 1.50$) were considered to a similar extent ($F_s < 1$).

We subsequently analyzed the number of foods chosen by our participants as a function of goal value. As predicted, when both food enjoyment and weight control goals were equally accessible and important, participants restricted their means choice and selected a smaller number of foods ($M = 7.00, SD = 3.03$) compared with the participants for whom the value/importance of the food enjoyment goal was experimentally enhanced ($M = 9.52, SD = 3.61$), $F(1, 36) = 5.44, p < .05$. To further explore whether this effect occurred as a consequence of a multifinality quest, we looked at the types of food participants selected in both conditions. An interaction emerged between goal importance and food type,

$F(1, 36) = 10.76, p < .05$. As expected, when both goals of food enjoyment and weight control were equally important, participants selected more foods that were considered both tasty and low in caloric content, and thus multifinal ($M = 4.26, SD = 1.62$), than foods that were tasty but high caloric and thus instrumental only to the food enjoyment goal ($M = 2.73, SD = 2.51$), $t(19) = 2.25, p < .05$. However, when the value of the food enjoyment goal was experimentally heightened, participants expanded their food choice to include more tasty foods ($M = 5.61, SD = 2.16$) than foods that were both tasty and low in calories ($M = 3.89, SD = 2.62$), $t(19) = 2.38, p < .05$ (see Figure 5).

Discussion

Study 4 replicates and extends our previous study in showing that even a subtle increase of goal importance/value restricts the quest for multifinal means. As in the previous study, participants in the current study for whom the value of the food enjoyment goal was experimentally enhanced were interested in more foods than participants for whom goals of both food enjoyment and weight control were presumably equally important. Furthermore, whereas this last group was interested in foods that were both tasty and low caloric, reflecting a multifinality quest, participants in our experimental group expanded their food preferences to include foods that were tasty, but not necessarily low in caloric content. This might have presumably happened as a result of a goal shielding effect (Shah et al., 2002), whereby the more important goal pulls resources away from alternative goals, resulting in the inhibition of the last. Our final study was designed to empirically investigate the latter mechanism.

Study 5

This study aimed to manipulate the importance of the eating goal by enhancing participants' level of hunger while holding constant their concern for maintaining a healthy diet. Specifically, we primed participants with eating-related versus neutral words

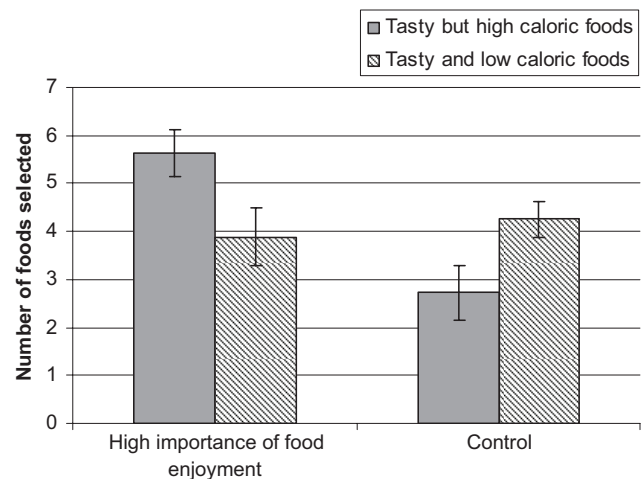


Figure 5. Number of tasty but high-caloric versus tasty and low-caloric foods selected, as a function of importance of the goal of food enjoyment (Study 4). Error bars represent standard error of the mean.

during lunch time, when the eating goal is presumably already very salient. Participants were then asked to select different types of foods, some healthy and some unhealthy (i.e., high caloric and fatty) but tasty. As a measure of alternative goal inhibition, we recorded participants' reaction times to diet-related words in a lexical decision task. We hypothesized that priming participants with eating-related words during lunch hours would increase their experienced level of hunger and, therefore, the importance of the eating goal. In turn, the increased importance of eating should inhibit the alternative goal of maintaining a healthy diet, reducing its multifinality constraints on food choice. Specifically, if hungrier participants do inhibit the alternative goal of maintaining a healthy diet, they should find a greater number of foods appealing and be less selective with regard to the types of food they choose. Thus, we expected our hungrier participants to be interested in a broader variety of foods, regardless of their health value. By contrast, we expected the less hungry participants, presumed to have both the eating and the healthy diet goals in mind, to be interested in fewer foods and to select more healthy (i.e., low caloric and low fat) versus unhealthy (i.e., high caloric and high fat) foods.

Method

Participants. Sixty-one University of Maryland psychology majors were invited to participate in the experiment in exchange for course credit. Participants reported whether they had had lunch, and we selected only those participants who had not had lunch yet, leaving us with 43 participants.

Procedure. Participants completed the entire experiment on desktop computers during lunch hours (between 11:30 a.m. and 2:00 p.m.). They were informed that the experiment concerned students' culinary interests at different times of day, and they completed an initial set of ratings to ensure the presence of the two goals, eating and maintaining a healthy diet. Specifically, they were asked to assess their level of hunger on a 10-point scale from 1 (*not at all*) to 10 (*a lot*). On the same scale they also rated (a) the extent to which they watched their weight and (b) their expectancy to consume healthy foods in the future. These two later ratings were correlated, $r(43) = .48, p < .01$, and we averaged them into a single score of participants' concern for a healthy diet. To avoid drawing particular attention to these questions, these initial ratings were embedded among several filler items and were presented in random order.

Manipulation of goal importance. Our manipulation of goal importance was introduced after this initial round of ratings. Specifically, in a lexical decision task, participants were presented either with eating-related words (*lunch, food, eat*), expected to increase their hunger experience, and, hence, the importance of the goal of eating, or neutral/control words (*chair, table, cartoon*, etc.) assumed to have no such effect. As a cover story, participants were told that this "attentional task" assesses people's ability to focus their attention at different times of day and that they would be completing two such tasks, at both the beginning and the end of the experiment.

Participants were instructed that the task required them to identify as quickly and as accurately as possible whether a presented target was a word or a nonword. At the beginning of each trial, a fixation point ("X") appeared at the center of the screen for 2 s to

indicate to participants where to focus their attention. The fixation point was then replaced by a target word or nonword. Participants were instructed to press the *I* key if the target was identified as a word and the *O* key if it was identified as a nonword.

After several practice trials including words as well as nonwords, participants were presented with the 24 experimental trials. In the high importance of eating condition, 18 of these trials contained eating-related words; three contained neutral words; and three contained nonwords. In the control condition, 18 trials contained neutral words, and six contained nonwords. Note that because the only purpose of this task was to prime participants in the experimental (but not in the control) condition with eating-related words, we did not record participants' reaction times.

Means choice. After completing the lexical decision task, participants were presented with a list of 20 foods and were instructed to choose the ones that they wanted to eat at that particular moment. Ten of these foods were considered unhealthy but tasty (pizza, burger, fries, etc.), and 10 were considered healthy (salad, vegetable soup, strawberries). We regarded the latter foods as multifinal, as they served both the goal of eating and that of keeping a healthy diet, whereas the former, high-calorie foods served solely the eating goal.

In order to ensure that the foods were indeed perceived as unhealthy versus healthy but did not differ in terms of their tastiness, in a pretest two external raters (one male and one female) rated each of the 20 foods on three dimensions: their caloric content (1 = *high caloric* to 7 = *low caloric*), healthiness (1 = *not healthy at all* to 7 = *very healthy*), and tastiness (1 = *not tasty at all* to 7 = *very tasty*). The interrater reliability was significant, $r(20) = .44$ to $.83, p < .05$. We therefore averaged the two raters' scores into a single score for each dimension (caloric content, healthiness, and tastiness). We then compared the two categories of foods (unhealthy and healthy) on each dimension. In contrast with the unhealthy foods, foods in the healthy category were indeed perceived to be less caloric ($M = 3.45, SD = 2.02$ vs. $M = 1.70, SD = 0.48$), $F(1, 18) = 7.00, p < .05$, and more healthy ($M = 4.35, SD = 1.84$ vs. $M = 2.20, SD = 1.13$), $F(1, 18) = 9.87, p < .05$, but equally tasty ($M = 6.10, SD = 0.93$ vs. $M = 5.95, SD = 0.79; F < 1$).

Inhibition of the alternative goal. To assess whether importance of the eating goal affected the accessibility of the alternative goal of keeping a healthy diet, we used a similar procedure as in Study 2. Specifically, in a lexical decision task, we measured participants' reaction times to 12 diet-related words (e.g., *diet, calories*) after subliminally (50 ms) priming them with words related to the focal goal (*eat, food, lunch*) and neutral words (*chair, table*, etc.). We also measured participants' reaction times to 12 neutral words and nonwords. These 36 trials were presented in a random order.

Finally, we measured again participants' degree of hunger. We then administered a modified funnel-type debriefing procedure to ascertain that the primes did not reach participants' awareness threshold. None of our participants reported any awareness of the primes.

Results and Discussion

We conducted initial analyses to ensure that the two goals were present to a similar extent across conditions. Indeed, participants in

the increased importance of eating condition did not differ from the participants in the control condition in their initial level of hunger ($M = 5.10$, $SD = 1.88$ vs. $M = 5.58$, $SD = 2.14$; $F < 1$), nor did they differ in their concern for a healthy diet ($M = 7.89$, $SD = 1.82$ vs. $M = 7.87$, $SD = 1.39$; $F < 1$).

Manipulation check. We conducted an ANOVA on participants' expressed degree of hunger following our priming manipulation. Controlling for their initial level of hunger, participants primed with eating-related words reported being hungrier than did those primed with neutral words ($M = 5.73$, $SD = 1.85$ vs. $M = 5.54$, $SD = 1.95$), $F(1, 40) = 6.39$, $p = .01$. It thus appears that our induction of the hunger experience via priming was effective.

The core hypothesis. We hypothesized that increasing the experience of hunger would result in increased importance of the focal goal of eating and would result in a reduction of the multifinality constraints imposed by the goal of maintaining a healthy diet on the selection of means to the focal goal. Thus, we expected participants in the increased importance condition to select a higher number of foods as appealing than participants in the control condition. Furthermore, participants in the control condition should be more selective with regard to the foods they endorsed, restricting their means set to foods that, in addition to the eating goal, would also fulfill the healthy diet goal. To test the first hypothesis, we conducted an ANOVA on the number of foods that participants selected. As predicted, participants primed with the eating words were interested in a greater number of foods than participants primed with the neutral words ($M = 7.42$, $SD = 3.11$ vs. $M = 5.33$, $SD = 2.74$), $F(1, 41) = 5.47$, $p < .05$.

In order to test whether our manipulation affected participants' preference for the different food types, we conducted a repeated-measures ANOVA on the number of healthy and unhealthy foods that each participant selected. A two-way interaction emerged between goal importance and type of food, $F(1, 41) = 4.26$, $p < .05$. As shown in Figure 6, when the importance of the eating goal was not enhanced, participants were interested in a greater number of healthy foods ($M = 3.54$, $SD = 1.84$) than unhealthy foods ($M = 1.79$, $SD = 1.53$), $t(23) = 4.27$, $p < .01$. By contrast, when the importance of the eating goal was enhanced, participants were less selective, as they were no more interested in the healthy foods

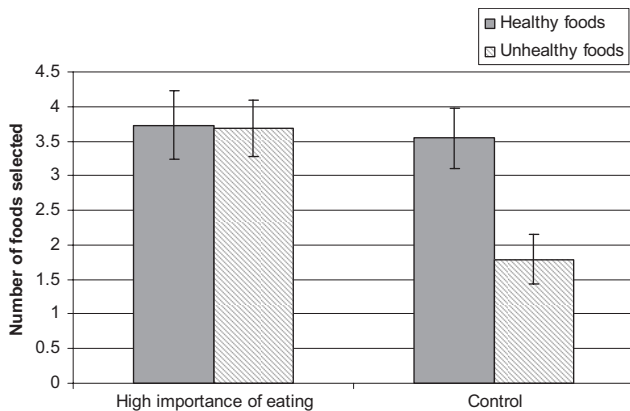


Figure 6. Number of healthy versus unhealthy foods selected, as a function of importance of the goal of eating (Study 5). Error bars represent standard error of the mean.

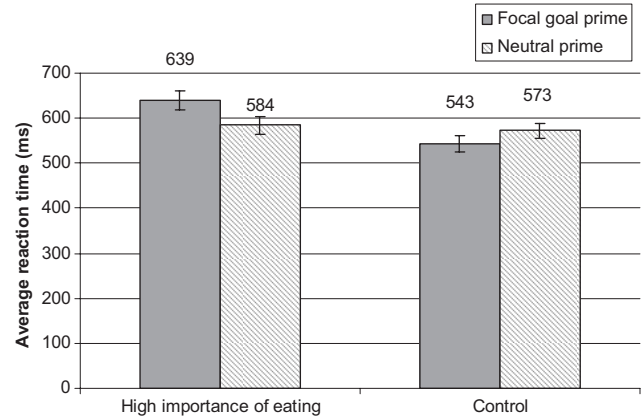


Figure 7. Participants' lexical decision times for diet-related targets when primed with the focal goal of eating or with a neutral word (Study 5). Error bars represent standard error of the mean.

($M = 3.73$, $SD = 2.46$) than in the unhealthy ones ($M = 3.68$, $SD = 2.08$; $t < 1$).

Inhibition of the alternative goal. Finally, we checked whether increased importance of eating resulted in the predicted inhibition of the health goal. To that end, we looked at participants' average reaction times to diet-related words after being primed with the focal goal versus the neutral prime in the second lexical decision task. Again, we used only correct responses in our analyses. We assumed that inhibition, or lowered accessibility of the goal, would be indicated by longer reaction times (Fishbach et al., 2003; Shah et al., 2002). To test this prediction, we performed a repeated-measures ANOVA on participants' average reaction time to the alternative goal of dieting when the focal goal served as prime versus when a neutral word served as prime. After covarying out the baseline reaction time to neutral targets and nonwords,³ a significant two-way interaction emerged between the prime (eating goal vs. neutral) as a within-subjects factor and goal importance (high vs. control) as a between-subjects factor, $F(1, 40) = 7.56$, $p < .01$. Our hunger priming manipulation slowed down lexical decision times to diet-related targets. As depicted in Figure 7, hungrier participants were significantly slower in recognizing diet-related words after being primed with the focal goal of eating than they were after being primed with a neutral prime, $F(1, 22) = 9.76$, $p < .01$. However, the less hungry participants in the control condition did not differ in their reaction times to diet-related words as a function of the prime ($F < 1$). These results support our hypothesis that increased importance of a focal goal results in an inhibition of the alternative goal.

Mediation of goal importance effects. To examine whether the effect of increased importance of the focal goal (of eating) on the number of means selected was mediated by an inhibition of participants' alternative goal of dieting, we conducted three regression analyses (R. M. Baron & Kenny, 1986). We first regressed the number of means selected on goal importance (dummy

³ A preliminary analysis indicated that our independent variable did not have any effect on the covariate. An ANCOVA was therefore deemed appropriate to test our hypothesis.

coded). A second regression assessed the relationship between goal importance and our assumed mediator, namely, participants' average reaction times to the dieting goal while simultaneously controlling for the baseline reaction time. Finally, we conducted a third regression to show that accounting for the direct effect of differences in participants' reaction times to the dieting goal eliminates the effect of goal importance on the number of means. The results of these analyses are presented in Figure 8. As shown, participants' reaction times to the dieting goal were found to have a positive effect on the number of means ($\beta = .55, t = 3.26, p < .01$) and to render nonsignificant the previous effect of increased importance of the focal goal on this number ($\beta = .17, ns.$). A Sobel test revealed that the complete mediating path was statistically significant ($Z = 1.91, p = .05$).

In summary, when importance of the focal goal of eating was heightened by our priming manipulation, this resulted in an inhibition of the alternative health goal, which in turn weakened the multifinality constraints it imposed on means to the focal goal and increased the number and variety of means to the focal goal (i.e., different foods) that participants selected. These results illustrate how people's good intentions to maintain a healthy diet may evaporate when they are hungry, namely, by inhibiting the dieting goal while craving to satisfy the immediate eating goal in whatever way possible.

General Discussion

Theorizing on the dynamics of action, Atkinson and Birch (1970) assumed that at any given point in time, many different action tendencies serving multiple motivational concerns may co-exist at varying strengths. Other authors too have recognized the pervasiveness of multiple-goal contexts and theorized about actors' possible responses in such situations, including the exclusionary one of "choice and sacrifice" (Cantor & Langston, 1989; Carver, 2004; Emmons & King, 1988; Higgins, 1997; Shah, 2005; Simon, 1967) and the integrative one of identifying a multifinal means capable of advancing the several active goals conjunctively (e.g., Cantor et al., 1992; Dhar & Simonson, 1999; Emmons & King, 1988; Khan & Dhar, 2007). The present research explored the latter process, in particular, its effect on the range of means options to a specific focal goal that the actor may consider. Specifically, we hypothesized that the presence of active background goals would narrow the range of means to a focal goal and restrict them to those that are multifinal, that is, those that serve (or at least do not impede) the alternative, background goals as well.

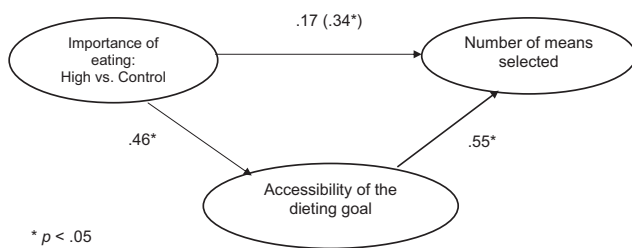


Figure 8. The effect of the eating goal importance on the accessibility of the dieting goal and the number of means selected (Study 5).

This notion received consistent support in the present research. Study 1 demonstrated the basic narrowing of the focal means set when alternative goals are introduced. Studies 2–5 explored, additionally, the possibility that a quest for multifinal means is subject to boundary conditions having to do with (a) the perceived feasibility of identifying multifinal means (Study 2) and (b) the importance or value of the focal goal (Studies 3–5). Specifically, Study 2 found a curvilinear relation between the perceived feasibility of finding multifinal means and the reduction in the means set size for the focal goal. Substantial reduction may occur at an intermediate range of feasibility, whereas no reduction may occur where finding alternative means is either very feasible or very unfeasible. Whereas under low-feasibility conditions the absence of reduction attests to goal choice, and occurs together with an inhibition of the alternative goal, under high-feasibility conditions no inhibition seems to occur, as the means selected afford the pursuit of both the focal and the alternative goals.

These findings suggest that the mere presence of an alternative goal does not necessarily affect the selection of means to the focal goal. It is rather the nature of the relationship between the focal and the alternative goals that does so. Specifically, the number of means to the focal goal is not affected if multifinal means to both goals can be readily found. This finding is informative, as it rules out a distraction hypothesis whereby the mere introduction of an alternative goal would reduce the number of means to the focal goal via a pull of attentional resources (Shah & Kruglanski, 2002): There is little reason to believe that the goals in our high-feasibility or low-feasibility conditions were any less distracting to participants than the goal in the moderate-feasibility condition, yet they effected a significantly lesser reduction in means to the focal goal. It seems more likely, therefore, that such a reduction relates to the feasibility of finding multifinal means to one's active goals.

Finally, Studies 3–5 supported that increased importance of the focal goal weakens the multifinality constraints imposed by the alternative goal and expands the number of means to the focal goal to include the ones that serve only this goal while actually hampering the alternative goal. Study 5 also found evidence that such an effect may be the result of a goal shielding effect, where the more important goal pulls resources away from the less important goal, resulting in an inhibition of the latter (Shah et al., 2002; Shah & Kruglanski, 2002). This, in turn, weakens the alternative goal's constraining effect on the means to the focal goal.

The present studies also contain evidence incompatible with an alternative interpretation of our findings, whereby introduction of the alternative goal reduces the commitment to the focal goal and that this is responsible for the observed narrowing of the means set size. The latter interpretation suggests a mere numeric reduction in the number of means and has no implications for the kinds of means selected. In contrast, the demonstrable multifinality of means selected in the moderate-feasibility condition of Study 2 and in the control conditions of Studies 3–5 attests to participants' greater selectivity, which is unlikely to have stemmed from a reduced commitment to the focal goal. Rather, it seems to attest to a multifinality quest in which our participants seem to have engaged.

Implications and Future Directions

The quest for multifinal means appears quite rational and superior to goal choice, as it promises to preserve the cake while eating

it too, representing the “best of possible worlds,” motivationally speaking. However, whereas rationality typically implies a conscious deliberation and choice, the multifinality constraints effect is likely to occur without individuals’ conscious awareness of the reasons for their preferences. In this sense, the multifinality quest appears to represent a low-level motivational mechanism designed to maximize actors’ desired outcomes.

Nonetheless, identifying multifinal means has a downside as well, related to the reduced number of means to the focal goal that comes as a consequence of striving for multifinality. Particularly where none of the generated means is assured to effect goal attainment, reduction in the overall number of means may also reduce the overall perceived attainment likelihood. Thus, the tradeoff here may involve increasing the (subjective) likelihood of attaining both the focal and alternative goals while decreasing the attainment likelihood of the focal goal as such. Indeed, we have seen that when goal importance increased (in Studies 3–5), the impact on individuals’ means selection seemed to reflect an attempt to increase the likelihood of attaining the focal goal at the expense of attaining both the focal and the alternative goals.

Effects of increased goal importance on the range of acceptable means to that goal may have important real-life implications. Consider an increase in the importance of the goal of (personal and national) security occasioned by a belligerent enemy activity, for example, an act of terrorism. This may inhibit the alternative goals derived from values of civil liberties, personal freedom, or the humane treatment of others. Consequently, various activities and policies might appear acceptable because they seem to serve the security goal, in oblivion of their consequences for other values and concerns. In other words, the multifinality constraints effect examined here in the context of simple individualistic pursuits (like health or dieting) may have considerable social and political implications that one may well want to investigate in further research.

Finally, the possibly unconscious nature of the multifinality constraints effect is worthy of further exploration. It has been long recognized that goals can exert their effects without actors’ explicit awareness (Ferguson et al., 2008; Fishbach & Ferguson, 2007; Kruglanski & Köpertz, 2009a, 2009b). It is thus possible that the means set to a focal goal is narrowed as function of the activation of various background goals without individuals’ awareness of this influence. In fact, exploratory data from our Studies 1 and 5 offer preliminary support for this notion. Specifically, participants in these studies were asked to provide reasons for their food choices. Two external raters categorized the reasons on the basis of the extent to which they reflected participants’ concern for time constraints (in Study 1) or a healthy diet (in Study 5). There was no significant difference between the two sets of ratings ($\chi^2 < 1$). Therefore, we used only one set of ratings and compared the number of reasons reflecting participants’ time constraints or dieting concerns with those that did not reflect such concerns. In Study 1, an analysis of the reasons participants provided for their food choices suggests that they were largely unaware of the time-related constraints imposed by activating their alternative goals for the day. Among the 99 reasons provided, only 18 indicated that participants’ food choices were affected by time pressure, $\chi^2(1, N = 99) = 40.09, p < .01$. No difference was observed between the two conditions as to whether the reasons for food choice reflected time pressure ($\chi^2 < 1$). Similarly, in Study 5,

participants listed a total of 115 reasons for food choice (“they are my favorites”; “I have a taste for them”; “fries have good texture and go well with everything,” etc.), among which only 20 mentioned dieting and/or health (“some of them are healthy”; “I picked those foods because they taste good and are healthy for me”; “I was in a mood for something healthy”), $\chi^2(1, N = 115) = 48.91, p < .001$. In other words, the preponderance of reasons mentioned had to do with participants’ food enjoyment, rather than with health-related reasons. Furthermore, there were no significant differences in the frequency of health-related versus health-unrelated reasons between the two conditions (high vs. low eating importance; $\chi^2 < 1$). These findings suggest that even though participants in the low eating importance condition selected predominantly healthy foods, they were no more aware of the role that the health goal may have played in their preferences than the participants in the high eating importance condition, who were largely nonselective in their food choices. In both studies, it appears that participants tended to explain their preferences in terms of the focal goal rather than the background goal(s). The present studies were not specifically designed to afford insight into this possibility; hence, additional work is needed to flesh it out.

Conclusion

In situations of goal conflict, a maximally rational response may be to find an integrative solution allowing all the conflicting goals to be attained. Such integration amounts to identifying a multifinal means that advances jointly the different present objectives. Because of its rationality, a quest for the multifinal option may constitute the preferred response to multiple-goal situations. As our studies show, such a quest effectively constrains the set of means to a given focal goal that is deemed acceptable, given that other, background, goals are also active. At times, however, locating the multifinal option may not appear feasible. Under these circumstances, the multifinality quest may be relinquished, and multifinality constraints may be relaxed. In other words, the integrative solution to the multiple-goal problem is then replaced by the exclusionary (choose and sacrifice) solution. As we have seen, this allows the consideration means set to the focal goal to reexpand. Another condition prompting a shift to the exclusionary mode is a substantial increase of commitment to the focal goal. This results in inhibition of the alternative goals (Shah et al., 2002), effectively turning the situation into a single-goal context, again fostering a corresponding expansion of the consideration means set. The ubiquity of goal plurality contexts in people’s everyday affairs highlights the interest value of the multifinality constraints effect and warrants its further exploration.

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