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Prioritizing Association Strength Versus Value: The Influence of Self-Regulatory Modes on Means Evaluation in Single Goal and Multigoal Contexts

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Means of goal attainment are said to be multifinal when they are capable of attaining more than 1 goal at the same time. Such means have an advantage over unifinal means because they have the potential to attain greater overall value. However, they have the disadvantage (relative to unifinal means) of diluting the association between the means and each of the goals (Zhang, Fishbach, & Kruglanski, 2007). In turn, diluted association strength is often interpreted as reduced means' instrumentality. Given these tradeoffs between value (favoring a multifinal option) and instrumentality (favoring the unifinal option), the question is under what conditions 1 or the other would be selected. Based on regulatory mode theory (Higgins, Kruglanski, & Pierro, 2003; Kruglanski et al., 2000), we predicted and found in 5 experiments that individuals operating in a *locomotion* self-regulatory mode prefer a unifinal to multifinal means, whereas individuals operating in an *assessment* mode prefer multifinal to unifinal means. Implications of these findings for self-regulatory phenomena are discussed.

Keywords: locomotion, assessment, multifinality, dilution, goals

Goals represent knowledge structures that specify desirable end-states that the actor would like to reach through action (Kruglanski, 1996). Because of the desirability of the imagined attainment of the goals, actors are motivated to exert effort in their pursuit (Förster, Liberman, & Friedman, 2007). In order to attain their goals, individuals must identify effective attainment means to the goals in question. Yet, not all means are created equal. Some means are more strongly associated with the goals than others, making them better candidates for utilization than less strongly associated means. Actors are unlikely to commit to an activity unless it is perceived to be instrumental to a valuable goal. A means that is highly associated with a goal is typically perceived as more instrumental to goal attainment than a less highly associated means. Because instrumental means get to be used repeatedly and, hence, get to be strongly associated with their goals, the strength of association between a means and a goal tends to be interpreted as instrumentality. In these terms then, a goal with strongly associated means appears more attainable than a goal with less strongly associated means (Kruglanski, 1996). Now, in some

contexts, the actor is presented with a choice between a means that is strongly associated with a goal but that yields less overall value, as compared with a means that has the potential to yield significant value but that is less strongly associated with the goal(s) that it serves. The question then is what may determine the individual's choice in such circumstances?

A case in point arises in a comparison between a means that serves only one goal to a means that serves several (two or more) goals. For example, some models of cellular phones have a singular feature (making phone calls), while others have a multitude of features (making phone calls, taking pictures, browsing the Internet, checking e-mail, etc.). The phone with multiple features is able to satisfy more goals than the simpler phone, generating more overall value (Chun & Kruglanski, 2005). However, the attachment of additional goals to the phone may dilute the association with any one of the attached goals, including the focal goal, in this instance, the goal of making phone calls (Zhang, Fishbach, & Kruglanski, 2007), reducing the phone's perceived instrumentality to any of its goals. In this sense then, means that are capable of serving multiple goals present a tradeoff between the association strength and value components, creating an important dilemma that has not received research attention to date. In order to make sense of the dilemma that actors face in multigoal contexts, we propose that the regulatory modes of locomotion and assessment may be useful in determining whether the association strength that drives instrumentality judgments or the perceived value component will be prioritized.

Research on goal systems theory (Kruglanski et al., 2002) has made apparent the tradeoff between association strength and value

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that is present when comparing a means that serves a single goal and a means that serves multiple goals. The main thesis of the present research is that individuals will differ in their preference for association strength versus value, depending on their self-regulatory mode. Before elaborating this hypothesis further, we review recent research findings based on goal systems theory that have implications for the relation between association strength and value components.

Goal Systems Theory

While traditional research in the psychology of goal pursuit has focused on single goal situations, recent psychological theory and research has begun to investigate the implications of having multiple goals active at the same time. Goal systems theory (Kruglanski et al., 2002) outlines the implications that arise from the cognitive configurations of goals and means. As such, the relative importance of means–goal association strength and goal value can be investigated by examining the structure of goal systems. The concomitant activation of two or more goals has two major implications for means evaluation.

First, when more than one goal is active at a given moment, actors are likely to adopt a means that is able to satisfy both goals at the same time, known as the *multifinality principle* (Chun & Kruglanski, 2005; Chun, Kruglanski, Sleeth-Keppler, & Friedman, 2011; Köpetz, Faber, Fishbach, & Kruglanski, 2011). Multifinal means are attractive because the joint attainment of multiple goals in the same instant yields greater overall goal *value* upon completion of the use of the means. While only one activity is pursued and completed, multiple goals are attained at once, thereby “killing two birds with one stone.”

Yet, as noted earlier, multifinal means present a tradeoff between the increased goal value on the one hand and a decline in the association between the means and each of the goals on the other hand, which is typically perceived as decreased instrumentality of the means to the goal. The *dilution model*, based on goal systems theory, demonstrates that when a means serves more than one goal simultaneously (i.e., is multifinal), its judged instrumentality to each of the goals is less, and this is mediated by decreased association strength between the means and each goal (Zhang et al., 2007). To demonstrate this effect, Zhang and colleagues (2007) conducted a series of studies in which they manipulated whether a given means (e.g., aerobic exercise, drinking water, use of computer) was said to serve a single goal or whether it was said to serve two or more goals. Across studies, a given means was perceived as less instrumental to and less strongly associated with the focal goal when the means was multifinal rather than unifinal. This effect held, regardless of whether the experimenter provided the goal(s), whether the participants provided the goal(s), or whether the strength of the linkage was manipulated via sequential priming procedures.

The reason for this effect has been explained according to the cognitive configuration of the elements in the goal system. Just as the associations between informational nodes in memory are weakened by additional linkages (known as the *fan effect*, Anderson & Reder, 1999), connecting a means to additional goals weakens the perceived strength of the linkage between the means and the goals. The greater the number of linkages between the

means and goals, the weaker the association between the means and any single goal.

Tradeoff Between Association Strength and Value

Therefore, when evaluating and selecting a means to pursue at a time when multiple goals are active, the actor must (oftentimes implicitly) determine the relative importance of the means–goal association strength versus the goal value. A means that is unifinal will tend to be more strongly associated with the focal goal but will provide less overall value than a multifinal means because it only has the potential to satisfy a single goal. Similarly, a means that is multifinal will tend to have a weaker association with the focal goal but will provide greater overall value than a unifinal means because it has the potential to satisfy multiple goals. While the multifinality and dilution effects have been extensively investigated and are known by now, no researcher has attempted to investigate the factors that would determine at what times a unifinal means would be preferred over a multifinal means and at what times the opposite would be the case. In the present research, we aim to investigate this issue experimentally.

Self-Regulatory Modes

Because of the association strength/value tradeoff attendant on the choice between unifinal and multifinal means, it is important to determine what factors will tilt means selection in one direction or the other. One particularly relevant source of a preference relevant to this choice should come from the individuals' self-regulatory mode (Higgins, Kruglanski, & Pierro, 2003; Kruglanski et al., 2000). The *locomotion* self-regulatory mode refers to an orientation toward movement. The dominant consideration has to do with how quickly and fluidly an activity can be performed. The *assessment* self-regulatory mode refers to an orientation toward critical evaluation of alternatives in order to do the “right” (or “best”) thing. The dominant consideration has to do with the perceived “goodness” of one’s choice. These two orientations, or regulatory modes, are independent from one another. As such, at any given moment, both can be high, both can be low, or one can be high and the other can be low. Furthermore, there is evidence to suggest that each of these orientations can be aroused situationally (e.g., Avnet & Higgins, 2003; Orehek, 2009) and reflect stable individual differences in the locomotion and assessment tendencies measurable via scales designed for this purpose (Kruglanski et al., 2000). A convergence across the situational and individual differences operations has been found, such that the two ways of estimating the level of locomotion and assessment have yielded identical effects (Kruglanski, Orehek, Higgins, Pierro, & Shalev, 2010).

Because the locomotion orientation is aimed at movement, its activation should prioritize association strength over value. A means that is strongly associated with a goal is one in which movement toward a goal is felt to be all but assured. In other words, given a means that is strongly associated with a goal, locomotors can be confident that they will be able to make fluid progress to their objective. The prioritization of association strength and attendant instrumentality judgments over value suggests that individuals high on locomotion will prefer a unifinal means (previously shown to be perceived as higher in association strength but lower on value) over a multifinal means (previously

shown to be lower on association strength but higher on value). Conversely, because the assessment orientation is aimed at selecting the best option according to its overall “goodness”; when it is active, value should be prioritized over association strength. The prioritization of value over association strength suggests, therefore, that individuals high on assessment will prefer a multifinal means over a unifinal means.

In summary, the present work integrates work on the dilution effect (Zhang et al., 2007) and the multifinality principle (Chun & Kruglanski, 2005; Chun, et al., 2011; Köpetz, et al., 2011) based on the goal systems paradigm (Kruglanski et al., 2002) with theory and research on regulatory modes (Higgins et al., 2003; Kruglanski et al., 2000), affording the identification of conditions under which a multifinal means will be preferred over a unifinal one or vice versa. As suggested above, the former preference is particularly likely when the assessment mode predominates over the locomotion mode and the latter preference, when the opposite is the case.

The Present Research

In all our studies, the main phenomenon of interest concerned the choice of unifinal versus multifinal means by individuals high (vs. low) on locomotion or assessment tendencies. In our first study, locomotion and assessment tendencies were measured via an individual differences instrument. In four subsequent experiments, we situationally manipulated the relative strength of the locomotion and assessment modes (Avnet & Higgins, 2003; Orehek, 2009). In our first two experiments, we manipulated via essays whether means of goal attainment were attached to a single goal or two goals. Participants then evaluated these means with a self-report measure. In our third experiment, participants generated either a single goal or three goals served by a given means. Participants then completed an implicit measure of means evaluation. In our fourth experiment, all participants were provided with a multifinal means. Using a sequential priming procedure, we then experimentally enhanced for some participants the association between the means and one of the goals, and the expressed preference for that means on part of the locomotors and the assessors was measured. Finally, in our fifth experiment, we experimentally manipulated whether a means served one or two goals by giving participants direct experience with the means in question. We then used a behavioral measure of means choice to test our hypothesis.

Across our studies, the multifinality variable was variously operationalized according to experimenter-provided information, participant generated information, unconscious strengthening of the linkages between means and goals, and direct experience with the means. Furthermore, we variously operationalized the dependent variable of means evaluation with a self-report scale, an implicit measure of evaluation, a measure of phenomenological experience, and a behavioral measure. We also used in our study a wide variety of goals and means differing in their contents. If the predicted pattern of results is found across this diverse range of procedures, this would provide strong evidence for the robustness of the current framework.

Experiment 1

Our aim in our first experiment was to investigate whether dispositional levels of the locomotion and assessment regulatory

modes would predict the preference for association strength versus goal value. Taking advantage of the Zhang et al. (2007) paradigm, we manipulated association strength and goal value by attaching means of goal attainment to either a single goal or two goals. In this way, we can see whether self regulatory modes influence whether association strength or value takes precedence. More specifically, we have an initial test of whether locomotors and assessors differ in their preference for unifinal versus multifinal means.

Method

Participants. In total, 173 participants (54 male, 119 female) living in the United States completed our survey over the Internet. The age of participants ranged from 18 to 82, with a mean age of 28. Gender was not associated with any of our variables, hence it is not discussed further.

Materials and procedure. Participants first completed dispositional measures of the locomotion and assessment regulatory modes. Subsequently, they read essays describing the advantage(s) of consuming tomatoes. Participants were randomly assigned to read either one advantage of consuming tomatoes (unifinal condition) or two advantages of consuming tomatoes (multifinal condition).

Regulatory mode. To measure trait levels of each of the regulatory modes, we administered the regulatory mode questionnaire (Kruglanski et al., 2000). This scale consists of 12 items that tap the assessment tendency (e.g., “I often compare myself to other people,” “I spend a great deal of time taking inventory of my positive and negative characteristics,” and “I often critique work done by myself or others”) and 12 items that tap the locomotion tendency (e.g., “I am a doer,” “When I finish one project, I often wait awhile before getting started on a new one” [reverse scored], and “When I decide to do something, I can’t wait to get started”). Response options ranged from 1 (*strongly disagree*) to 6 (*strongly agree*). A composite index for each scale was created by averaging across the items ($\alpha = .80$ for assessment, and $\alpha = .79$ for locomotion). In this sample, locomotion and assessment tendencies were not reliably correlated ($r = .12$, $p = .11$).

Multifinality of the means. Participants read a description of a means that could serve a health goal, using materials adapted from Zhang et al. (2007, Study 1). Participants were told that we were investigating how people acquire health-related information from scientific readings. All participants then read a short essay and answered a few questions after the essay. In the essay, participants were told that the consumption of tomatoes serves the goal(s) of (a) preventing cancers and/or (b) preventing degenerative disease of the eye. Participants were randomly assigned to receive either information linking tomatoes to one goal or information linking tomatoes to two goals. The order of presentation of the goals (preventing cancer/eye health) was counterbalanced: Half the participants were presented with cancer information first (or only this information in the one goal condition), and half the participants were presented with the eye health information first (or only this information in the one goal condition).

Means evaluation. To assess participants’ evaluations of the means, they responded to four Likert-type questions on a 7-point scale ranging from 1 (*not at all*) to 7 (*very much*). The four items included the statements, “I plan to consume tomatoes in the fu-

ture,” “Consuming tomatoes is important to me,” “I will be sure to consume enough tomatoes in the future,” and “I am committed to consuming tomatoes.” The mean of the four items served as the dependent measure of means evaluation ($\alpha = .96$).

Results

Following Higgins, Kruglanski, and Pierro (2008), we calculated participants' predominant regulatory mode by subtracting assessment scores from locomotion scores. Therefore, higher scores on the regulatory mode variable indicate greater predominance of the locomotion mode, while lower scores indicate greater predominance of the assessment mode. We then conducted a linear regression analysis predicting the evaluation of tomatoes as means with the regulatory mode predominance, the goal number (dummy coded: 0 = one goal, 1 = two goals), and their interaction entered as predictors. This analysis revealed a significant main effect of regulatory mode predominance, such that locomotion predominance was positively related to evaluations of tomatoes ($\beta = .25$, $t = 2.66$, $p < .01$). More importantly, this analysis revealed the expected two-way interaction between regulatory mode and goal number ($\beta = -.38$, $t = -3.81$, $p < .001$). To investigate this interaction further, we computed the association between regulatory mode predominance and means evaluation in the one and two goal condition separately. When tomatoes were attached to one goal, locomotion predominance was positively correlated with the evaluation of tomatoes ($\beta = .27$, $t = 2.59$, $p = .01$). When tomatoes were attached to two goals, however, locomotion predominance was negatively correlated with the evaluation of tomatoes ($\beta = -.30$, $t = -2.84$, $p < .01$).¹

Discussion

The results from the first experiment provide initial support for our hypotheses. The predominance of locomotion tendencies was positively related to evaluation of a unifinal means but was negatively related to the evaluation of a multifinal means. Though these initial results are encouraging, a major limitation with our first experiment is that the measurement of the regulatory modes does not permit us to make any inferences regarding their causal influence on means evaluations. To address this problem, in our second experiment, we attempt to conceptually replicate these results using an experimental manipulation of regulatory modes.

Experiment 2

Our main aim in our second experiment was to replicate the results of Experiment 1 using an experimental manipulation of regulatory mode. In addition to information regarding tomatoes, we added a second essay in which participants were presented with information regarding the benefits of aerobic exercise. This was assumed to provide additional evidence regarding the generalizability of these findings to additional means–goal relations.

Method

Participants. One hundred seventy-one (62 male, 109 female) undergraduate psychology students at the University of Maryland participated in exchange for partial credit in a psychology course. The age of participants ranged from 18 years to 38

years, with a mean age of 20.3. Gender did not exert any effect on the dependent variables, hence it is not discussed further.

Materials and procedure. Participants first completed a task designed to manipulate the locomotion versus assessment regulatory modes. Next, participants read essays describing the advantage(s) of aerobic exercise and of consuming tomatoes. Participants were randomly assigned to read either one advantage of each of these activities (unifinal condition) or two advantages of each (multifinal condition).

Regulatory mode. To manipulate regulatory mode, we used the behavior recall paradigm developed by Avnet and Higgins (2003). Participants recalled times when they behaved as assessors or as locomotors. To do this, participants were asked to “think back to times in which they . . .” followed by three items from the regulatory mode scale. Participants were randomly assigned to either a locomotion condition or an assessment condition. In the locomotion condition, participants recalled times in which “you” [the participant] “acted like a ‘doer,’” “finished one project and did not wait long before you started a new one,” and “decided to do something, and you could not wait to get started.” In the assessment condition, participants recalled times in which “you” [the participant] “compared yourself with other people,” “thought about your positive and negative characteristics,” and “critiqued work done by others or yourself.”

Multifinality of the means. Participants read descriptions of two means that could serve health goals, using materials adapted from Zhang et al. (2007, Study 1). Participants were told that we were investigating how people acquire health-related information from scientific readings. They then read two short essays and answered a few questions after each essay. In one of the essays, participants were told that aerobic exercise serves the goal(s) of (a) protection against heart disease, and/or (b) maintaining healthy bones. In the other essay, participants were told that the consumption of tomatoes serves the goal(s) of (a) preventing cancers, and/or (b) preventing degenerative disease of the eye. The order of presentation of the means (aerobic exercise and consuming tomatoes) and the goals (protecting against heart disease/healthy bones and preventing cancer/eye health) were fully counterbalanced. Specifically, half the participants read about tomatoes first, and remaining the participants read about aerobic exercise first. Furthermore, half the participants were presented with heart disease information first (or only this information in the one goal condition), and the remaining participants were presented with the healthy bones information first (or only this information in the one goal condition); Finally, half the participants were presented with cancer information first (or only this information in the one goal condition), and the remaining half were presented with the eye

¹ We also analyzed these data using centered locomotion and assessment scores as independent predictors of means evaluation in a regression analysis. When the means was attached to a single goal, locomotion was positively related to evaluation of tomatoes ($\beta = .24$, $t = 2.25$, $p < .05$) and there was a trend such that assessment was negatively related to evaluation of tomatoes ($\beta = -.16$, $t = -1.53$, $p = .13$). When the means was attached to two goals, locomotion was (moderately significantly) negatively related to evaluation of tomatoes ($\beta = -.20$, $t = -1.87$, $p = .065$), and assessment was positively related to evaluation of tomatoes ($\beta = .28$, $t = 2.55$, $p = .01$).

health information first (or only this information in the one goal condition).

Means evaluation. To assess participants' evaluations of each of the two means, they responded to the same four Likert-type questions as in Experiment 1. Following the aerobic exercise essay, the wording was changed to refer to engaging in aerobic exercise ($\alpha = .93$ for aerobic exercise and $\alpha = .94$ for tomatoes). For example "I plan to consume tomatoes in the future" was changed to "I plan to engage in aerobic exercise in the future."

Results

To test our hypotheses regarding means evaluation, we conducted a 2 (regulatory mode: locomotion vs. assessment) \times 2 (goal number: one vs. two) \times 2 (means: aerobic exercise vs. consuming tomatoes) mixed-factors analysis of variance (ANOVA), with the regulatory mode and goal number variables as between-subjects factors and the means as a within-subjects factor. This analysis revealed a main effect of regulatory mode, $F(1, 167) = 4.66, p < .05$, such that participants in the locomotion condition ($M = 4.90, SE = 0.12$) evaluated the means more positively than in the assessment condition ($M = 4.52, SE = 0.12$). More importantly, this analysis revealed the expected two-way interaction between regulatory mode and goal number $F(1, 167) = 12.86, p < .001$. As shown in Figure 1, the results from each of the means (tomatoes and aerobic exercise) displayed the same pattern. Participants in the locomotion condition evaluated the means more favorably when they were attached to two goals ($M = 5.21, SE = 0.17$) than when they were attached to one goal ($M = 4.57, SE = 0.17$), $F(1, 167) = 6.96, p < .01$. In contrast, participants in the assessment condition evaluated the means more favorably when they were attached to two goals ($M = 4.82, SE = 0.18$) than when they were attached to one goal ($M = 4.21, SE = 0.19$), $F(1, 167) = 5.93, p < .05$.

Discussion

The results from the second experiment replicate the results of our first study with an experimental manipulation of regulatory modes. Participants in the locomotion condition preferred a unifinal means over a multifinal means, whereas participants in the assessment condition preferred a multifinal means over a unifinal means. In our third experiment, we attempt to conceptually repli-

cate these results using a slightly different procedure. To extend our results to additional means and goals, we investigated computers as a means of goal attainment. Also, participants in the next study generated their own goals rather than being provided with goals by the experimenter. Finally, we assessed means preferences using an implicit, rather than an explicit, measure of this variable.

Experiment 3

In our third experiment, we again investigated the impact of self-regulatory modes on preference for unifinal versus multifinal means. In addition to the changes mentioned above, this experiment differed from its predecessor in one more respect. Rather than attaching the means to *two* goals in the multifinal condition, we attached the means to *three* goals in this condition. We expected to replicate the pattern of results from Experiment 2 here, thereby extending our results to an additional means-goal context.

Method

Participants. Seventy-eight psychology undergraduates (46 female, 32 male) at the University of Maryland participated in exchange for course credit. The age of participants ranged from 18 to 27, with a mean age of 20. Gender did not exert any effects, thus it is not discussed further.

Materials and procedure.

Regulatory mode. The self-regulatory modes of locomotion versus assessment were manipulated with the same procedure as in Experiment 2.

Multifinality of the means. The multifinality of the means was manipulated following the procedure used in Zhang and colleagues' (2007) Study 2. To manipulate the extent to which computers were perceived to be multifinal, participants in one condition were asked to list one goal that computers serve, while participants in another condition were asked to list three goals that computers serve.

Means evaluation. A modified affect misattribution procedure (AMP; Payne, Cheng, Govorun, & Stewart, 2005) was used to assess participants' evaluation of computers. In this task, participants were first presented with either the word *computer* or the word *grey* for 50 ms. In previous research (Payne et al., 2005) with pictures as primes, a gray screen is presented in the neutral condition. This task was modified for the presentation of the word *computer* rather than a picture of computers because each participant likely has a different history of experiences with different types of computers (e.g., laptop vs. desktop, PC vs. Mac, flat screen vs. larger screen, etc.). Therefore, we substituted the word *grey* for the gray screen typically used as a neutral prime. The prime was backward masked with a string of XXXXXXXX for 125 ms and then followed by a Chinese ideograph for 100 ms. The Chinese ideograph was then masked by white noise until the participant made his or her judgment. Participants were asked to press one key if they liked the drawing (the Chinese ideograph) and another key if they did not like the drawing. Each participant responded to 20 trials with a neutral prime and 20 trials with the computer prime, with the order of trials randomly determined for each participant. The proportion of affirmative responses when the word *grey* was presented served as a baseline measure of responding to neutral stimuli, while the proportion of affirmative responses

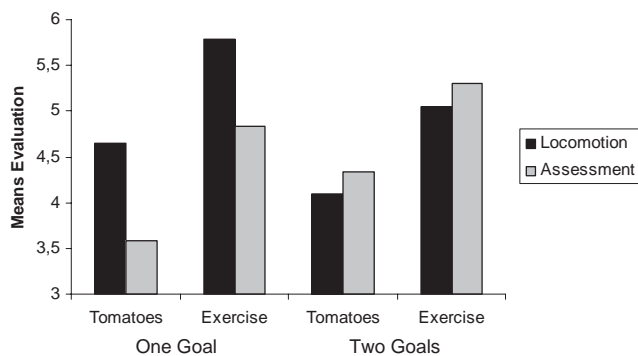


Figure 1. The effect of regulatory mode and goal number on explicit means evaluation (Experiment 2).

to the word *computer* served as a measure of their implicit evaluation of computers.

Results

To test our hypotheses regarding the implicit evaluation of computers, we computed a 2 (regulatory mode: locomotion vs. assessment) \times 2 (multifinality: single goal vs. multiple goals) between-subjects analysis of covariance, controlling for responses to neutral stimuli in the AMP procedure. This analysis revealed the predicted two-way interaction between regulatory mode and multifinality condition, $F(1, 73) = 9.47, p < .01$. All other F s < 1 . In the locomotion condition, participants' implicit evaluation of computers was more favorable when computers served a single goal ($M = .69, SE = .07$) than when computers served multiple goals ($M = .47, SE = .05$), $F(1, 73) = 6.01, p < .05$. In the assessment condition, there was a trend such that participants' implicit evaluations of computers were less favorable when computers served a single goal ($M = .54, SE = .06$) than when computers served multiple goals ($M = .69, SE = .06$), $F(1, 73) = 2.71, p = .10$. These results are displayed in Figure 2.

Discussion

The results from our third experiment conceptually replicate the findings from the second study. In both experiments, participants in the locomotion condition exhibited a preference for a unifinal over a multifinal means, whereas participants in the assessment condition exhibited a preference for a multifinal over a unifinal means. Presumably, this is because participants in the locomotion condition prefer a means that is strongly associated with a goal over a means that has the potential to garner greater overall value, while participants in the assessment condition prefer the attainment of greater goal value over means' association strength.

Yet, these studies did not directly assess the association strength of the means to either goal. To test this more directly, our fourth experiment presented all participants with a means that they were told could satisfy two goals. In one condition, the strength of the linkage between the means and one of the goals was strengthened with a sequential priming procedure. In the other condition, the priming procedure was designed so as not to enhance either linkage. In this way, we could test directly whether means–goal association strength influences the evaluations of means by locomotors and assessors. This experiment also introduced a new

means (drinking water) and a new measure of means evaluation (thirst).

Experiment 4

Our fourth experiment was designed to directly test whether locomotors and assessors differ in their evaluations of a means that is either more strongly associated with a single goal or more equally associated to two goals. Following from our conceptual analysis and the results from our first three experiments, we expected that participants in the locomotion condition would report being thirstier when the linkage between drinking water and a single goal was strengthened than when the linkage between drinking water and two goals remained equal. In contrast, we expected that participants in the assessment condition would report being thirstier when drinking water served two goals equally than when the linkage between drinking water and one goal was experimentally enhanced.

Participants' thirstiness was used as a measure of participants' evaluation of the means of drinking water. Our previous studies had explicit (Experiments 1 & 2) and implicit (Experiment 3) ratings of means evaluation, while our next study (Experiment 5) has a behavioral measure. Hence, in this, our fourth, study, we attempted to move beyond these measures in order to tap participants' phenomenological experience related to means evaluation. To the extent that a person evaluates drinking water as positive, we expected that they would experience an associated rise in their feelings of thirst. In other words, people should experience the sensation that calls for the means (drinking water) and signals its positivity when the means is perceived to be advantageous.

Method

Participants. Fifty-eight (38 female, 20 male) undergraduate psychology students at the University of Maryland participated in exchange for partial course credit. The age of participants ranged from 18 years to 29 years, with a mean age of 21 years. Gender did not produce any effects and is therefore not discussed further.

Materials and procedure.

Regulatory mode. Locomotion versus assessment regulatory modes was manipulated with the same procedure as in Experiments 2 and 3.

Multifinality of the means. All participants were presented with information describing two goals that the means of drinking water could satisfy. Participants read an essay in which they were told that water served the goal of having clear skin and the goal of having energy. We experimentally manipulated the strength of the linkage between drinking water and the skin clarity goal using a sequential priming procedure. This procedure was demonstrated to be effective in manipulating the association strength between a means and a goal in Zhang and colleagues' (2007) Study 4 (in their study, the means of jogging was said to serve the means of strengthening muscles and increasing oxygen in the blood).

In both conditions, participants completed a sequential priming procedure allegedly being tested for use in future research. This task presented participants with 100 trials in which they were instructed to press one key on a computer keyboard (as quickly and accurately as possible) if a meaningful word was presented and to press another key if the letter string did not compose a meaningful

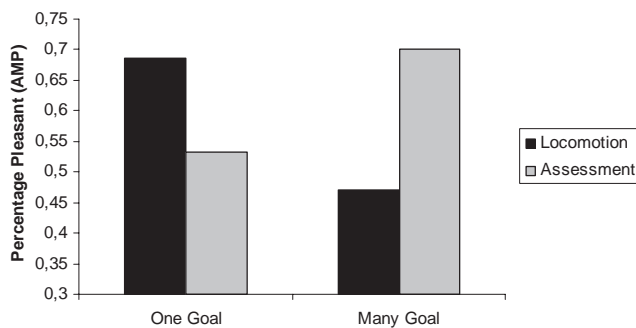


Figure 2. The effect of regulatory mode and goal number on implicit means evaluation (Experiment 3). AMP = affect misattribution procedure.

word. Participants were first presented with a fixation point (+) for 300 ms. They were then presented with a prime for 30 ms, backward masked with a string of Xs for 150 ms. Participants were finally presented with the target word. An equal number of trials included meaningful words as targets and meaningless words as targets. In all of the meaningless word trials, neutral words served as primes. Among the meaningful word trials, 38 trials included neutral words as primes.

In 12 of the 100 trials, participants responded to the target word *water*. Participants were randomly assigned to either a condition in which the linkage between water and the goal of skin clarity was strengthened or a condition in which this linkage was not strengthened. To strengthen the water–skin clarity linkage, participants were primed with the word *skin* and then responded to *water* as the target word. In the control condition, participants were primed with neutral words and responded to *water*. In this way, any change in means preference cannot be due to the priming of water (as it remained constant) but must only be due to the change in the strength of the means–goal association.

Participants debriefed at the end of the study did not report anything suspicious about this procedure, did not link it to any other aspects of the procedure, and were not able to identify the true purpose of this procedure.

Means evaluation. To assess the extent to which participants were interested in drinking water, participants responded to a single item embedded among irrelevant questions asking them, “how thirsty are you at the present moment?” with responses ranging from 1 (*not at all*) to 7 (*extremely*).

Results

To test our hypotheses, we conducted a 2 (regulatory mode: locomotion vs. assessment) \times 2 (implicit link: skin–water vs. neutral–water) between-subjects ANOVA on the reported level of thirst. This analysis revealed a significant two-way interaction, $F(1, 54) = 8.64, p < .01$. For all other effects, $F < 1$. Decomposing this interaction, we computed the simple effects comparing the skin–water condition to the neutral–water condition for each level of the regulatory mode variable. In the locomotion condition, participants were thirstier when the association between skin health and water was strengthened ($M = 6.06, SE = 0.43$) than when the association was not strengthened ($M = 4.67, SE = 0.46$), $F(1, 54) = 4.88, p < .05$. In the assessment condition, participants were less thirsty when the association between skin health and water was strengthened ($M = 4.38, SE = 0.51$) than when this association was not strengthened ($M = 5.75, SE = 0.48$), $F(1, 54) = 3.85, p = .054$. The results from this experiment are displayed in Figure 3.

Discussion

The results from Experiment 4 provide additional support for our conceptual framework. All participants were placed in a multifinal condition in which drinking water was said to serve two goals. We then directly manipulated the association between drinking water and one of the two goals for some participants and not for others. Locomotors reported experiencing greater thirst when the association between the means of drinking water to one goal was experimentally enhanced than when drinking water was asso-

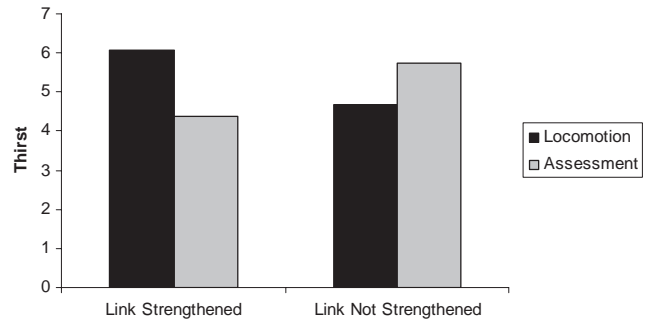


Figure 3. The effect of regulatory mode and means–goal association strengthening on thirst (Experiment 4).

ciated with two goals equally. In contrast, assessors reported experiencing greater thirst when the means of drinking water was associated with two goals equally than when the association between this means and one of the goals was experimentally strengthened.

This study provides evidence that locomotors prefer unifinal means over multifinal means because of the greater association between the means and a goal. A greater association between a means and a goal has been assumed to be akin to its perceived instrumentality (Shah & Kruglanski, 2003; Zhang et al., 2007). When a particular means is used to attain a goal often, the association between the means and the goal becomes strengthened. This frequent pairing and the resulting association therefore indicate that the means can be perceived as instrumental to the goal. In other words, the person’s past behavior leads to a stored association between the means and the goal, which is then used as a basis for perceiving the means’ instrumentality for the particular goal. Because locomotors are primarily concerned with fluid movement, they prioritize means that are perceived to afford this movement, in this case, means that are strongly associated with the goal.

Another consequence of strengthening the association between drinking water and one of the goals is that it would decrease the linkage between drinking water and the second goal (Zhang et al., 2007). By reducing the linkage to the second goal, the means would be perceived to accrue less of the value associated with that second goal, thereby reducing the overall perceived value to be accrued if the means is pursued (Kruglanski et al., 2002). Because of this, assessors preferred the means of drinking water when it was associated with both goals equally rather than when the association between drinking water and one of the means was experimentally strengthened.

Across the four experiments, we have found support for our hypotheses using a variety of means (tomatoes, aerobic exercise, computers, drinking water). In our fifth experiment, we attempt to add an additional means, namely, an ink pen. We have found support for our hypotheses using self-reported evaluation of means, implicit evaluation of means, and the phenomenological experience of thirst. Yet, none of our experiments measured participants’ actual behavior and use of the means. With our fifth experiment, we attempt to fill this gap.

Experiment 5

Our primary aim in our fifth experiment was to measure participants’ means preference by examining their behavior toward

potential means in our experimental design. In this experiment, participants were given direct experience with a pen in the first phase of the experiment. During this phase, participants were given a pen that could serve two goals (writing and serving as a laser pointer). All participants then used the pen for writing. Participants were then randomly assigned to either try the laser pointer function or not. The latter participants, whose attention was not drawn to the laser pointer function, were thus unaware that the pen could serve this particular goal. In the second phase of the experiment, participants were led to a room to fill out a final set of questionnaires where two pens were available on the desk. The experimenter unobtrusively recorded whether the participants used the pen with which participants had previous experience or the alternative pen.

This study differed from the previous experiment in an important way. In the previous studies, the multifinality of the means was either communicated to the participants or generated by the participants. In this study, participants would have direct experience with the pen as serving the singular goal of writing or as serving the two goals of writing and serving as a laser pointer.

Method

Participants. One hundred fifty-one undergraduate psychology students (78 female, 71 male) participated in exchange for course credit. Two participants did not report their gender. The age of participants ranged from 18 years to 30 years, with a mean age of 20 years. Gender did not exert any effects on our dependent variables and thus is not discussed further.

Materials and procedure. Upon arriving at the laboratory, participants were asked to store their personal belongings next to the coat rack in the waiting area. This was done so that participants would not have a personal pen to use during the completion of the procedures, ensuring that they would use the pens provided. In fact, no participant produced their own pen for use during the study. Participants were then led to a private room to fill out a set of questionnaires. They were provided with a pen to use and were asked to alert the experimenter when they completed the packet. Upon completion of the materials, the experimenter then collected the materials (the pen and the papers) and directed the participant to a second experimental room. They were told that they were being taken to this room “because we need to have you complete some final paperwork.” In this room was a debriefing form, with open-ended questions, and two pens. One of the pens was a Bic ballpoint pen, and the other was a laser-pointer pen of the same style used in the first part of the study.

Regulatory mode. Locomotion versus assessment regulatory mode was manipulated using the same procedure as in Experiments 2–4.

Multifinality of the means. Following the procedure of Zhang and colleagues’ (2007) Study 6, participants were given a pen to write with at the outset of the experiment. The pen could also function as a laser pointer by clicking a button on its side. This pen was used to complete the informed consent form and the survey containing the regulatory mode manipulation. Participants in the multifinality condition received an additional page in their survey which asked them to evaluate the laser pointer function of the pen. The attention of participants in the other condition was not drawn to the laser pointer function. The experimenter was able to

unobtrusively observe the participant during this portion of the experiment. Participants whose attention was not intentionally drawn to the laser pointer function did not discover this function on their own.

Means evaluation. After the completion of the initial survey, the survey and laser pens were collected from participants. They were told at this point that the experiment had concluded and that we just needed them to complete some final paperwork. Participants were led to a new experimental room, where a debriefing form was placed on a desk. Also on the desk were two pens: the same style laser pen they had used before, and a pen without the laser pointer function (the position of the pens was counterbalanced across participants). The experimenter, blind to all experimental conditions and hypotheses, unobtrusively recorded whether participants selected the laser pen or the Bic pen.

Results

To test our hypotheses, we examined the extent to which participants in each of the regulatory mode conditions selected the laser pen. Participants in the locomotion condition were less likely to select the laser pen when its multifinal function was apparent (32.4%) than when their attention was not drawn to the multifinal function (53.7%), $\chi^2(N = 75) = 3.42, p = .064$. Participants in the assessment condition were more likely to select the laser pen when their attention had been drawn to the multifinal function (69.4%) than when it was not (47.5%), $\chi^2(N = 76) = 3.74, p = .053$. The results from Experiment 4 are shown in Figure 4.

Discussion

In this study, we again found that locomotors preferred a unifinal over a multifinal means of goal attainment, while assessors preferred a multifinal means over a unifinal means. This experiment differed from the first four experiments in that participants had direct experience with the ability of the means to attain the goal(s). Additionally, we were able to observe participants’ behavioral use of the means. Finally, this experiment expanded the generality of the previous findings by adding an additional type of means to be evaluated.

General Discussion

Recent advances in the understanding of human goal pursuit have highlighted the way in which individuals think and behave in

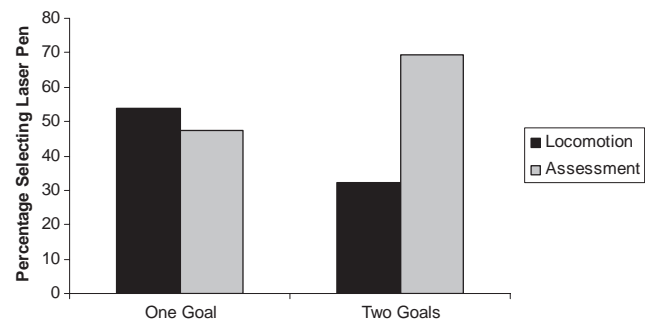


Figure 4. The effect of regulatory mode and goal number on behavioral choice (Experiment 5).

multiple-goal contexts (Kruglanski et al., 2002). In this research, researchers have discovered that individuals oftentimes elect to pursue means that can serve more than one goal at a time (i.e., are *multifinal*, Chun & Kruglanski, 2005; Chun et al., 2011; Köpetz et al., 2011). The advantage of this strategy is that the individual is able to attain greater overall goal value by “killing two birds with one stone.” Yet, the quest for multifinality comes at a cost of reduced association strength between the means and the goal(s) at stake. (Zhang et al., 2007). For instance, though a cellular phone that has multiple features generates more goal value, the association between the phone and each goal, including the principal one of making phone calls, is likely to be weaker. As noted earlier, dilution of association is typically interpreted as a reduction of means instrumentality. Hence, it presents the actor with a dilemma of whether to prioritize the strength of the association, translating into perceived instrumentality, (Zhang et al., 2007), or the perceived value component.

The present set of five experiments provides an initial framework through which we can understand when and why individuals would prefer a unifinal or a multifinal means. We predicted that because the self-regulatory mode of locomotion is aimed at movement and is concerned with fluid progress, when in the locomotion mode, actors would prioritize association strength over value. Conversely, because the self-regulatory mode of assessment is aimed at critical evaluation and is concerned with making the best choice, when in the assessment mode, actors would prioritize value over association strength. Therefore, we predicted that locomotors would prefer unifinal over multifinal means, while assessors would prefer multifinal over unifinal means.

Across our five experiments, we consistently found that locomotors evaluated unifinal means more favorably than multifinal means, and assessors evaluated multifinal means more favorably than unifinal means. This pattern was exhibited regardless of whether the means were evaluated according to a self-report measure, an implicit measure, participants’ phenomenological experience, or participants’ behavior. Moreover, this pattern was replicated when the multifinality variable was manipulated with experimenter provided goals, participant generated goals, or direct experience with the goals.

To more directly test whether the association strength and value considerations were driving the preference for unifinal versus multifinal means, our fourth experiment presented all participants with a multifinal means. We then strengthened the linkage between the means and one of the goals using a sequential priming procedure. This had the effect of increasing the association of the means to one of the goals, which should dilute the association between the means and the other goal (Zhang et al., 2007). In this case, locomotors preferred the means when it had greater association to a single goal. Because of the presumed dilution of the means association and, hence, instrumentality to the alternative goal, it should be perceived to garner less overall value (Kruglanski et al., 2002). Because of this, we expected that assessors would prefer the means when it was associated with both goals equally rather than when the association with respect to one of the goals was strengthened, precisely the pattern found.

An alternative explanation for the results of Experiment 4 is that locomotors are more susceptible to manipulations of association strength than assessors because they are less thoughtful than assessors. In this way, the present results would be due to the fact

that association strength was more salient than was value considerations, and the less thoughtful individuals clung to the most salient information. Indeed, assessment tendencies are associated with greater thoughtfulness than locomotion tendencies. Therefore, assessors’ thoughtfulness may buffer them from momentary adjustments in the association strength. However, there are three reasons to suspect that this is not the case. First, the results of our remaining four studies cannot be explained by this assumption. In none of the other studies does it seem plausible to assume that association strength would be more salient than value considerations. Second, this explanation assumes that assessors are not also relying on a simple heuristic. However, it does indeed seem that assessors are using a heuristic in which “more (goal attainment) is better.” Third, we find the same pattern of results when using implicit and explicit measures of means evaluation. If assessors were not affected by the manipulation of association strength because of their thoughtfulness, then it seems unlikely that we would find the current pattern of results using subtle implicit measure that do not allow for deliberation. Therefore, differential preference for association strength impacting instrumentality versus value considerations seems to be the most plausible explanation of the findings rather than the notion that locomotors are more likely to use simple heuristics than are assessors. Future research could explore whether locomotors still prefer unifinal means when value considerations are made more salient than association strength.

The results from our series of experiments provide the first depiction of the way in which individuals resolve the dilemma inherent in multigoal contexts. For individuals who prioritize association strength over value (in this case locomotors), unifinal means are preferred over multifinal means. For individuals who prioritize value over association strength (in this case assessors), multifinal means are preferred over unifinal means. Future research could profitably explore other variables that lead to a prioritizing of association strength versus value considerations in self-regulatory situations. For instance, enhancing the perceived value of (or commitment to) a focal goal relative to alternative goals should privilege a unifinal means with respect to that particular focal goal versus a multifinal means that serves those alternative goals as well.

Future research could extend the current framework to explore its implications for personal relationships by studying the role of people as instrumental means to the attainment of goals. Just as computers can be framed as serving a single or multiple goals, so too can friends, family members, and romantic partners. We would expect that locomotors would prefer significant others who serve fewer goals, while assessors would prefer significant others who serve multiple goals. Because of this, the structure of social networks may differ for locomotors and assessors.

So far we have experimentally manipulated whether a means is attached to a single goal or to multiple goals, yet future research could explore whether locomotors and assessors differ also in the way they encode and recall the meaningfulness and usefulness of means. For example, because of their preference for unifinal means, locomotors may draw their attention to a singular feature while ignoring others. In contrast, assessors may draw their attention to multiple features or multiple potential consequences of various activities. These possibilities illustrate the considerable potential for future insights that may accrue from a joint consid-

eration of goal systemic notions such as multifinality and the contents of specific motivational tendencies embodied in the presently examined modes of locomotion and assessment.

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