Emotion
2007, Vol. 7, No. 3, 680–684


1528-3542/07/$12.00 DOI: 10.1037/1528-3542.7.3.680

# Preference and the Specificity of Goals

Arthur B. Markman
University of Texas at Austin

C. Miguel Brendl
INSEAD, Fontainebleau, France

Kyungil Kim
Ajou University, Seoul, South Korea

In this study, the authors examined (a) the effect of changes in the need to eat on expressed preferences for foods that are appropriate for different times of day and (b) whether that need is directed toward food in general or foods contextually appropriate to the time of day. Previous findings suggest that, when the goal is active relative to when it is inactive, items relevant to satisfying a goal increase in value but items unrelated to that goal decrease in value. The authors observed that, when people needed to eat, they sought foods that are contextually appropriate to the time of day of the study. Hence, the goal they sought to fulfill was narrower than seeking foods in general.

*Keywords:* goals, preferences, motivation, devaluation

Motivation is a critical determinant of action and emotion (Carver & Scheier, 1998; Higgins, 1987). Psychological research assumes that motivation involves a structure of goals (Kruglanski et al., 2002). The endstate of a goal (often called the *goal state*), is either a positive state of the world to be approached or a negative state of the world to be avoided. A goal can vary in level of activation, which translates into strength of motivation.

Activating a goal changes our feelings toward objects in our environment, and consequently, our preferences toward those objects (Lewin, 1926). In this article, we attempt to better understand this influence of goal activation on preference. Our general thesis is that predicting the influence of goals on preferences requires determining the scope of the participants' goals (e.g., to eat food in general vs. to eat a certain kind of food).

Indeed, it has been difficult to assess the relationship between goal activation and preference, despite the importance of this topic. One reason is that people have difficulty articulating the factors that drive their behavior (Bargh & Chartrand, 1999; Nisbett & Wilson, 1977). In this article, first we briefly review research on the relationship between goal activation and preferences that allows us to explore the scope of the participants' goals. Then, we present a new study that suggests that the scope of those goals that drive preferences may (at least in some conditions) be narrower than previous research would predict.

Arthur B. Markman, Department of Psychology, University of Texas at Austin; C. Miguel Brendl, INSEAD, Fontainebleau, France; Kyungil Kim, Department of Psychology, Ajou University, Seoul, South Korea.

The affiliation for C. Miguel Brendl will be Department of Marketing, Kellogg School of Business, Northwestern University in the Fall of 2007.

This research was supported by National Institutes of Health Grant No. 1-R21-DA015211-01A1 and a fellowship at the IC$^2$ institute to Arthur B. Markman.

Correspondence concerning this article should be addressed to Arthur B. Markman, University of Texas, Department of Psychology, 1 University Station, A8000, Austin, TX 78712. E-mail: markman@psy.utexas.edu

## Motivation and Preference

We adopt a motivational framework that assumes that goals are representational structures connected to representations of the means that support goal satisfaction (Kruglanski et al., 2002; Markman & Brendl, 2005). On this view, goals are activated by having motivational energy spread within a network of goals. Goals that are active pass activation along to supportive objects; that is, to means that help to satisfy that goal. The increased activity of these goal-supportive objects manifests itself as increased preference for them.

Thus, when a goal is activated, we expect people to increase their preferences for such objects that are related to the active goal. We call this increase in preference for goal-related objects *valuation*. A few studies have provided indirect evidence that is consistent with valuation effects (Read & van Leeuwen, 1998), and others have provided more direct evidence for valuation (Cabanac, 1971; Ferguson & Bargh, 2004; Nisbett & Kanouse, 1969).

If we assume that there is a limited amount of motivational energy in the goal system, increasing activation in one end of the system requires decreasing activation elsewhere. If goals have some natural resting level of activation, a strongly active goal may cause those goals that are unrelated to the current goal to dip below that resting activation level. This account predicts that preferences for objects (e.g., sneakers) that are distantly related to a focal goal (e.g., to eat) may actually decrease when that goal becomes more active. We call this decrease in preference for goal-unrelated objects *devaluation* (Brendl, Markman, & Messner, 2003). Note that goal-unrelated objects are not in conflict with a goal, as, for example, fatty foods would be for the goal of losing weight.

We have previously obtained reliable evidence for devaluation. For example, we found that people with a high need to eat gave reliably lower preference ratings to nonfoods than did those with a low need to eat (devaluation). Furthermore, people were less willing to pay for raffle tickets for a chance to win cash when they had a high need to smoke than when they had a low need to smoke (Brendl et al., 2003).

It is interesting that, in our previous research, we have had somewhat more difficulty obtaining reliable valuation effects than devaluation effects. For example, in the studies mentioned in the previous paragraph, people gave only slightly higher preference ratings for foods when they had a high need to eat than when they had a low need to eat. The valuation effect in this study was small and not statistically significant. Similarly, people in the study just described were willing to pay only slightly more to purchase raffle tickets for a chance to win cigarettes when they had a high need to smoke than when they had a low need (Brendl et al., 2003).

If our proposal about the relationship between goal activation and preference is correct, then why have we failed to observe consistent valuation effects? One possibility is that individuals' goals are actually narrower than we expected them to be intuitively. For example, in the eating study just mentioned, we assumed that we would see valuation effects for foods, because activating the need to eat should activate the need to eat foods in general and not just particular kinds of foods. Indeed, if the function of the need to eat is to provide energy, then it should increase preferences for objects that provide energy, which are foods in general. However, the global need to eat may be translated into actionable mental representations by means of goals that are narrower than the need itself. Then we may have failed to observe significant valuation, because only those foods within the scope of the specific goal would increase in their preference with an increase in the need to eat. Whereas the general need may provide the motivational energy to desire objects, more specific goals would provide the scope of objects to be desired.

There is some evidence that bears on this question in the domain of eating, but it actually suggests that the need to eat is fairly general. Gilbert, Gill, and Wilson (2002) had participants rate their willingness to eat spaghetti with meat sauce either the following morning or the following afternoon. Note that spaghetti is considered appropriate for the afternoon but not for the morning. Participants also performed simultaneously an easy or a hard secondary task, which we ignore here because it is not of relevance for our question. Finally, participants rated how hungry they were during the experimental session and were classified either as hungry or as sated. Hungry participants predicted that they would like eating spaghetti equally in the morning or in the afternoon. In contrast, sated participants predicted that they would like eating spaghetti more in the afternoon than in the morning. When people were in need to eat, they believed that they would desire foods in general, whereas when they were sated, they believed that they would desire particular foods. The findings suggest that people's naïve theory is that the need to eat increases preference for foods in general. However, people predicted what they would like the next morning or afternoon without actually experiencing the morning or afternoon time. Hence, we do not know whether the need to eat at a particular time of day would actually increase preference for all foods.

To explore whether the need to eat is often narrowly focused on particular foods, we report here a study in which we activated the need to eat and infer the level of specificity of the goal state that connects to this need. We assessed preferences for a range of foods and nonfoods either at 9:00 a.m. (around breakfast time) or at 4:00 p.m. (near dinner time). The foods we used are both items related to breakfast but not dinner (e.g., pancakes), as well as those related to dinner but not breakfast (e.g., lasagna). The food products were embedded among many nonfood products, supposedly as part of a marketing study. The task was to rate product liking in general rather than the desire to consume a certain food "now." The study mimicked preferences of grocery shoppers rather than those of grocery eaters. Time of day was an unobtrusive variable. At no time did we point out explicitly that the study was being conducted in the morning or in the evening.

Two possible patterns of data could arise, depending on the specificity of goal states in this context. If the eating goal state is broad, then people with a high physiological need to eat were expected to show valuation for both breakfast and dinner foods and devaluation for nonfoods. With respondents' rating their general liking for foods, this is quite conceivable, as well as in line with the naïve theory of hunger. In contrast, the eating goal state in this context could also be specific to contextually relevant foods, even if triggered by the general physiological need to eat and even if time of day is an unobtrusive contextual cue. In this case, at 9:00 a.m., participants were expected to show valuation for breakfast foods, devaluation for nonfoods, and neither valuation nor devaluation for dinner foods. In contrast, at 4:00 p.m., participants were expected to show valuation for dinner foods, devaluation for nonfoods, and neither valuation nor devaluation for breakfast foods.

## Method

### Participants

The manipulation involved eating bread with butter (which, in pilot studies, numerous female participants were unwilling to eat). For this reason, we conducted the present study with only male participants, 160 undergraduate students at the University of Texas at Austin (40 per condition). They received course credit for their participation.

### Design

This study was a 3 (item type: breakfast foods, dinner foods, nonfoods) $\times$ 2 (need level: high need, low need) $\times$ 2 (time of day: morning, evening) mixed design. Item type was examined within participants. Need level and time of day were examined between participants. The primary dependent variable was the preference rating on a 9-point scale ranging from *strongly dislike* (1) to *strongly like* (9).

### Materials

The items to be rated were names of food and nonfood products (see the Appendix). There were 8 foods rated by a separate group of participants as related to breakfast but not dinner (breakfast-related foods), 8 foods rated as related to dinner but not breakfast (dinner-related foods) and 32 nonfood items that were rated in the pretest as unrelated to both breakfast and dinner. The nonfood items were chosen to be a range of objects and consumer products. They were selected to help mask that the study was primarily interested in the ratings for the foods. In the task in which the stimuli were normed, 10 participants rated the relatedness of these items to breakfast and to dinner on a scale ranging from 1 (*not related at all*) to 9 (*very related*). The foods related to breakfast had been rated as highly related to breakfast ($M = 8.50$) but not to dinner ($M = 4.06$). Similarly, the dinner foods had been rated as related to dinner ($M = 8.19$) but not breakfast ($M = 2.66$). Finally, the nonfoods had been rated as being unrelated to both breakfast ($M = 2.13$) and dinner ($M = 1.28$).

## Procedure

All participants were asked to refrain from eating for at least 45 min before coming to the lab, where they would perform a "butter taste test." Modeled after the test used by Brendl et al. (2003), the taste test served as an unobtrusive manipulation of need to eat. Participants in the *high-need* condition were appetized by receiving a small amount of bread (about 5 g) with a little salted butter on it. The small amount of food provides a preload, which is known to lead to the release of insulin and to increase the need to eat (Herman, 1996; Rodin, 1985). Salt has also been shown to increase the need to eat (Denton, 1982; MacGregor & De Wardener, 1998; Schulkin, 1991). Participants in the *low-need* group were sated by receiving a large amount of bread (100 g) with unsalted butter on it. Next, we had participants perform a few other tasks to provide a delay of about 15 min between the time they ate and their ratings of the food and nonfood items. Then, participants were asked to rate the attractiveness of a variety of consumer products on a 9-point scale ranging from *not at all attractive* (1) to *very attractive* (9). Participants believed that they were norming stimuli for a future study, and so they were asked to tell us how attractive the items were in general and were told explicitly not to rate how much they would like to have the item at that moment. After the preference ratings, participants rated how hungry they felt on a 9-point scale.

# Results

## Manipulation Check

As a manipulation check, we analyzed ratings of hunger in a 2 (need level) × 2 (time of day) analysis of variance (ANOVA). These results suggest that we successfully manipulated the need to eat, as participants in the low-need condition gave significantly lower hunger ratings ($M = 3.35$) than did participants in the high-need condition ($M = 4.79$), $F(1, 156) = 13.75$, $p < .001$. There was no main effect of time of day or of the Time of Day × Need Level interaction, both $F$s $< 1$.

## Preference Ratings

The mean preference ratings as a function of item type, need level, and time of day are presented in Table 1. To correct for differences in scale use across participants, we converted the ratings to $z$ scores for each participant, and we used the mean $z$ scores for the items in each condition for the statistical analyses. For clarity, Figure 1 shows the mean $z$ score in the high-need condition minus the mean $z$ score in the low-need condition. This figure can be conceptualized as showing the degree of valuation/devaluation for the items, with bars above the line representing valuation (higher preference in the high-need vs. the low-need condition) and bars below the line representing devaluation (lower preference in the high-need than in the low-need condition).

We first analyzed the $z$ score data using a 3 (item type) × 2 (need level) × 2 (time of day) mixed-model ANOVA by item. Of importance, this analysis revealed a significant three-way interaction, $F(2, 45) = 3.96$, $p < .05$; as well as significant two-way interactions between need level and item type, $F(2, 45) = 16.67$, $p < .01$; and between item type and time of day, $F(2, 45) = 5.20$, $p < .01$. We were interested in valuation and devaluation effects, so in the next analysis, we compared the mean $z$ scores in the high- and low-need conditions. Essentially, we are asking whether there is significant valuation and devaluation for each item type in the morning and in the evening.[1]

The pattern of data suggests that participants' eating goal states were specific to the types of food relevant to the time of day. We first considered the participants tested in the morning. For them, there was significant valuation for breakfast foods, as those participants tested in the high-need condition had a significantly greater preference for breakfast foods ($z = -.01$) than did those in the low-need condition ($z = -.27$), $t(7) = 3.22$, $p <$ 05. In Figure 1, a bar with a positive value represents this mean difference; that is, the valuation effect. There was significant devaluation for nonfoods, with participants in the high-need condition having less of a preference for nonfoods ($z = -.01$) than participants in the low-need condition ($z = .10$), $t(31) = 2.56$, $p < .05$; this is represented as a bar with negative value in Figure 1. In contrast, for these morning participants, dinner foods did not show reliable valuation, with participants in the high-need condition giving only slightly higher ratings on average ($z = .04$) than people in the low-need condition ($z = -.07$), $t(7) = 1.23$, $p > .10$. In other words, the positive value of the respective bar in Figure 1 does not differ from zero.

This pattern shifts for participants tested in the evening. The evening participants had a significantly greater preference for dinner foods when they were in the high-need condition ($z = .24$) than when in they were in the low-need condition ($z = -.04$), $t(7) = 2.46$, $p < .05$. Again, they showed significant devaluation for nonfoods, with participants in the high-need condition having a significantly lower preference for nonfoods ($z = -.01$) than participants in the low-need condition ($z = .09$), $t(31) = 2.71$, $p < .05$. Whereas participants in the high-need condition rated the breakfast items as more attractive ($z = -.17$) than did those in the low-need condition ($z = -.30$), this difference was only marginally significant, $t(7) = 2.16$, $p = .067$.

Another way to explore this same interaction is to compare ratings of high-need participants tested in the morning to those tested in the evening and to compare ratings of low-need participants tested at each time of day. This analysis supports a similar conclusion to the one just reported. People in the high-need condition gave reliably higher ratings to breakfast foods in the morning than in the evening, $t(7) = 3.51$, $p < .05$. They gave reliably higher ratings to dinner foods in the evening than in the morning, $t(7) = 4.17$, $p < .05$. In contrast, ratings in the low-need condition, ratings of breakfast foods did not differ reliably in the morning or the evening, $t(7) = 1.24$, and the same was true for dinner foods, $t(7) = .40$, both $p$s $> .10$.

# Discussion

This study demonstrates that a physiologically triggered need to eat can connect to feelings of preference through fairly specific eating goal states. In this study, we manipulated the potential specificity of the goal contextually. We knew from our pretest that people cognitively associate particular foods with particular times

[1] We also did a three-way ANOVA by participant. Because of the variability in some of the conditions, the three-way interaction in this analysis was not significant. We conducted a more focused comparison of breakfast foods and dinner foods as a function of need level and time of day. This three-way interaction was marginally significant, $F(1, 156) = 3.76$, $p = .054$.

Table 1
*Mean Preference Ratings (and Standard Errors) for Each Item Type as a Function of Need Level and Time of Day*

| | | *M* (and *SE*) for: | | |
|---|---|---|---|---|
| Need level | Time of day | Breakfast foods | Dinner foods | Nonfoods |
| Low | Morning | 4.28 (1.45) | 4.80 (1.18) | 5.15 (0.80) |
| High | Morning | 4.86 (1.27) | 4.95 (1.17) | 4.77 (0.97) |
| Low | Evening | 4.22 (1.46) | 4.80 (1.72) | 5.22 (0.98) |
| High | Evening | 4.39 (1.63) | 5.41 (1.40) | 4.76 (0.72) |

of day. The strength of the valuation effects for foods was stronger at the contextually appropriate time of day. Statistically reliable valuation effects were obtained in the morning for breakfast foods and in the evening for dinner foods. Smaller and statistically unreliable valuation effects were obtained for contextually inappropriate foods. Finally, significant devaluation effects were obtained for the nonfoods at both times of day.

It is interesting that preference ratings for foods not contextually appropriate for the time of day were not influenced in a statistically reliable fashion by the need to eat. This finding may explain the puzzling observation that some previous studies have tended to find weak valuation effects. If goals are often specific, and items that are moderately related to the goal state show a pattern intermediate between valuation and devaluation, then many items that are intuitively thought to be related to an active goal state may yield patterns of preference ratings that are not reliably influenced by the strength of a goal. Indeed, it is surprising how few studies in the literature show clear-cut evidence for valuation (e.g., Cabanac, 1971; Ferguson & Bargh, 2004). It is possible that there have been considerably more studies seeking valuation effects that have yielded nonsignificant results and hence have not been published. Our results suggest the possibility that valuation effects may have been sparse in the literature because, as we did initially, researchers may have defined the set of need-relevant items too broadly. Valuation effects reflect experienced preferences and are hence at the heart of the influence of motivation on emotional experiences.

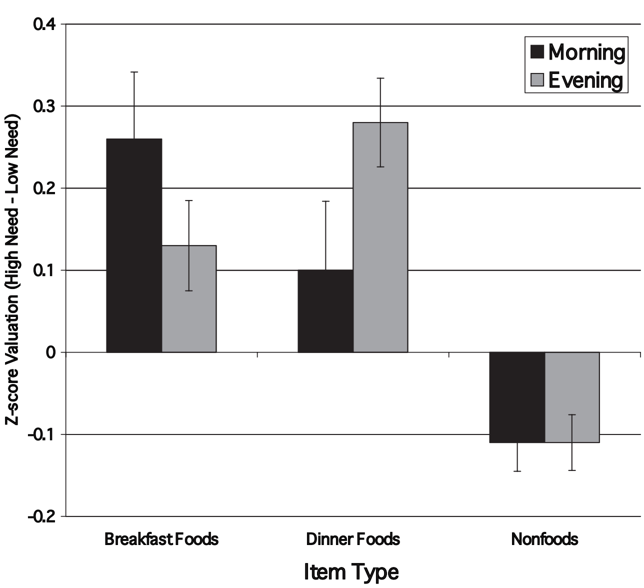


*Figure 1.* Valuation and devaluation effects (and standard errors) for the three types of items expressed as a difference in the *z* scores of participants' preference ratings.

The observation that the effect of the need to eat is specific to foods that are contextually appropriate to the time of day is consistent with research by Hetherington, Rolls, and Burley (1989). They had people eat specific foods and then contrasted their hedonic judgments of taste, texture, smell, and appearance for the food they had just eaten to their judgments of those dimensions for other foods. Participants' judgments of the foods they had just eaten declined much more than did their judgments of other foods, suggesting that the hedonic quality associated with eating is strongly influenced by recent experience. These two lines of work investigate two different mechanisms by which recent food consumption influences preferences. Hetherington et al. investigated the scope of foods with which one satiates after having consumed a particular food, holding a constant level of need to eat. We varied the level of need to eat and investigate the scope of foods one desires as a result. Indeed, none of the foods rated by participants in our study were targets for satiation, as none of them were directly related to the rolls and butter consumed in our manipulation of need to eat. It is nonetheless worth investigating how the food-specific effects found for satiation and goal activation may be related.

The present study found that the general need to eat drives food preferences through more specific eating goals. We found significant valuation only for foods that were contextually relevant for the time of day that the study was conducted. However, our activation of the need to eat was very moderate. It is possible that the level of specificity of eating goals depends in part on the strength of the abstract need to eat. A more severe need to eat may lead to a broader preference for foods. This returns us to our initial thesis. Our data show that, to understand when activating a need increases preferences for objects, we need to understand the level of abstraction of the intervening goals that the need activates. We now know that this level of abstraction can be quite specific, but we still need to learn more about when this level will be abstract and when it will be specific.

## References


Bargh, J. A., & Chartrand, T. L. (1999). The unbearable automaticity of being. *American Psychologist, 54,* 462–479.

Brendl, C. M., Markman, A. B., & Messner, C. (2003). Devaluation of goal-unrelated choice options. *Journal of Consumer Research, 29,* 463–473.

Cabanac, M. (1971). Physiological role of pleasure. *Science, 173,* 1103–1107.

Carver, C. S., & Scheier, M. F. (1998). *On the self-regulation of behavior.* New York: Cambridge University Press.

Denton, D. (1982). *The hunger for salt.* New York: Springer-Verlag.

Ferguson, M. J., & Bargh, J. A. (2004). Liking is for doing: The effects of goal pursuit on automatic evaluation. *Journal of Personality and Social Psychology, 87,* 557–572.

Gilbert, D. T., Gill, M. J., & Wilson, T. D. (2002). The future is now: Temporal correction in affective forecasting. *Organizational Behavior and Human Decision Processing, 88,* 430–444.

Herman, C. P. (1996). Human eating: Diagnosis and prognosis. *Neuroscience and Biobehavioral Reviews, 20,* 107–111.

Hetherington, M., Rolls, B. J., & Burley, V. J. (1989). The time course of sensory-specific satiety. *Appetite, 12,* 57–68.

Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review, 94,* 319–340.

Kruglanski, A. W., Shah, J. Y., Fishbach, A., Friedman, R., Chun, W. Y., & Sleeth-Keppler, D. (2002). A theory of goal systems. *Advances in Experimental Social Psychology, 34,* 331–378.

Lewin, K. (1926). Vorsatz, Wille und Bedürfnis [Intention, will, and need]. *Psychologische Forschung, 7,* 330–385.

MacGregor, G. & de Wardener, H. E. (1998). *Salt, diet, and health*. New York: Cambridge University Press.

Markman, A. B., & Brendl, C. M. (2005). Goals, policies, preferences, and actions. In F. R. Kardes, P. M. Herr, & J. Nantel (Eds.), *Applying social cognition to consumer-focused strategy* (pp. 183–200). Mahwah, NJ: Erlbaum.

Nisbett, R. E., & Kanouse, D. E. (1969). Obesity, food deprivation, and supermarket shopping behavior. *Journal of Personality and Social Psychology, 12,* 289–294.

Nisbett, R. E., & Wilson, T. D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review, 87,* 231–259.

Read, D., & van Leeuwen, B. (1998). Predicting hunger: The effects of appetite and delay on choice. *Organizational Behavior and Human Decision Processes, 76,* 189–205.

Rodin, J. (1985). Insulin levels, hunger, and food intake: An example of feedback loops in body weight regulation. *Health Psychology, 4,* 1–24.

Schulkin, J. (1991). *Sodium hunger.* New York: Cambridge University Press.

## Appendix

## Items Used in Experiment

### Breakfast Foods

| | |
|---|---|
| Donut | Pancake |
| French toast | Toast |
| Muffin | Waffle |
| Oatmeal | Cornflakes |

### Dinner Foods

| | |
|---|---|
| Baked chicken | Spaghetti and meatballs |
| Meat loaf | Steak |
| Pasta | String bean |
| Rotisserie chicken | Fish |

### Nonfoods

| | |
|---|---|
| 3Com Palm Pilot | Mechanical pencil |
| Charmin toilet paper | Nike basketball shoes |
| Chrysler PT Cruiser | Oil paints |
| Digital cameras | Post-It Notes |
| Door knob | Rollerblades (in-line skates) |
| Duracell batteries | Sony Playstation 2 game system |
| Flag | Backpack |
| Ford Explorer sport utility vehicle | Stapler |
| Hammer | Sunglasses |
| Head and Shoulders shampoo | University of Texas postcard |
| Ice Bats hockey tickets | University of Texas sweatshirt |
| Ink | Yahoo search engine |
| Key | Yamaha motorcycle |
| Land's End clothing | Baseball cap |
| Macintosh G4 laptop computer | Canvas backpack |
| Marlboro cigarettes | Car stereo with CD player |

Received March 7, 2006
Revision received March 20, 2007
Accepted March 26, 2007 ■