

# The role of behavioral mind-sets in goal-directed activity: Conceptual underpinnings and empirical evidence

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## Abstract

The cognitive and motor behavior that people perform in the course of pursuing a goal can induce a mind-set that persists to influence the strategy they use to attain very different goals in unrelated situations. Although the strategies governed by a mind-set are typically applied consciously and deliberately, they are performed without awareness of the reasons for their selection. Research in both social psychology and consumer behavior exemplifies the impact of mind-sets on comprehension, judgments, and decision making, thus providing evidence of the scope and diversity of their effects.

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People's past behavior can influence their future behavior. The reason is often obvious. Individuals often assume that if a behavior has been effective in attaining a goal in one situation, it will again be effective in another similar situation. They can also repeat their past behavior because they find it to be intrinsically enjoyable. In some instances, they may recall and use their past behavior as a basis for a future behavioral decision without any clear memory of either its utility or its desirability (Albarracín & Wyer, 2000).

In these examples, the decision to repeat a past behavior is obviously intentional and is likely to depend on the similarity of the conditions in which the behavior was previously performed (and the goals to which it was directed) to those that exist in the situation at hand. However, research performed in both our laboratory and others' indicates that the behavior people perform in one situation can also influence their behavior in a quite *different* situation, in the pursuit of goals that are totally unrelated to those to which the first behavior pertained. Moreover, this can occur for reasons of which individuals are unaware. For example, ranking the qualities of a marriage partner from high

to low in importance can increase people's estimates of the importance of environmental issues that they consider in an unrelated experiment (Schwarz & Wyer, 1985). Comparing the physical attributes of animals can increase the likelihood of purchasing one of several products that are on sale after the completion of an experiment (Xu & Wyer, 2008). Inducing people to provide different answers to a series of questions about animals (i.e., "which animal is smallest?" "Which animal is most ferocious?") can increase the variety of products they select in a subsequent product choice situation (Shen & Wyer, 2010). Inducing people to think of themselves as socially interdependent increases memory for the relative positions of physical objects in a display (Kühnen & Oyserman, 2002).

In this article, we propose a general theoretical framework for conceptualizing these rather diverse phenomena and the conditions in which they occur. In doing so, we introduce the construct of a procedural *mind-set*, which is activated in the course of cognitive or motor activity in one situation and, once activated, influences the behavioral decisions that are made in a later, quite different situation. Although the studies we bring to bear on the utility of our formulation have largely been conducted in our own laboratory, representative research in other paradigms is also conceptualized within the framework we propose.

Our use of the term mind-set is restricted. In other contexts, for example, the term has been used to describe the persistence

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of goals (e.g., to be productive; Keinan, 2007) and the perceptions that ability and intelligence are fixed or malleable (Dweck, 2006). In this article, we restrict the term to a cognitive or motor *procedure* that, having been employed in one situation, is reapplied in later situations independently of both (a) the particular goal to which the procedure is directed and (b) the semantic content to which the procedure is applied. Although the activation and use of a mind-set are governed in part by general principles of knowledge accessibility, additional considerations arise that render the construct rather unique.

### Theoretical framework

Many types of declarative knowledge are stored in memory. They include semantic concepts that are used to interpret specific pieces of information, configurations of attributes that pertain to either a particular referent or a more general one, episodic representations of specific experiences we have had, more prototypic sequences of events that occur frequently, facts and propositions about ourselves or the world in which we live, attitudes and opinions, and implicit theories. Some of this knowledge also consists of *procedures* that can be used to pursue goals that we wish to attain. For example, we know how to make a cup of tea, to change a tire, and to access the Internet. At a more general level, we may know how to prepare an article for publication and, at a more specific level, how to brush our teeth. Such procedures consist of a number of cognitive and motor actions that are normally performed sequentially in pursuit of the objective at hand.

The procedures that are stored in memory as part of declarative knowledge can be deliberately retrieved and consulted in the course of goal-directed processing in much the same way one consults a recipe for baking a cake. As these procedures are frequently applied and become well learned, however, they become increasingly automatic, often being performed with little cognitive mediation (Anderson, 1982, 1983; Schneider & Shiffrin, 1977). A complete conceptualization of goal-directed behavior requires a distinction between its deliberative and automatic components and how they interface. However, although we will briefly discuss this interface, our primary objective in this article is more modest. That is, we focus on the deliberate application of procedures that are stored in memory as part of declarative knowledge and are consciously consulted in making goal-directed decisions.

The conceptualization we propose has both a structural component and a process component. Neither component, in isolation, is particularly novel. In combination, however, they provide a useful framework for understanding the operation of behavioral mind-sets and the factors that determine their influence.

#### Structural assumptions

The deliberate pursuit of a goal requires the retrieval of previously acquired concepts and knowledge that specify how the goal is attained. The representation of this knowledge in memory can be conceptualized as a plan–goal hierarchy similar to that proposed by Kruglanski (1996), Kruglanski et al. (2002),

and see also Markman and Brendl (2000) and Srull and Wyer (1986). Goal concepts exist at different levels of abstractness. For example, “buying strawberries” is an exemplar of “buying groceries,” and this concept, in turn, exemplifies “shopping.” Similarly, “deciding which of two computers to buy” is an exemplar of “deciding which of two objects is preferable” or, at a higher level, “making a comparison” (Smith, 1994).

The means of attaining a goal can be conceptualized as a sequence of concepts, each of which specifies a behavioral objective, or *subgoal*. For example, a superordinate goal might be to “see a play,” and the subgoal concepts that denote a means of attaining it might include “arrange for tickets,” “get to the theater,” etc. A series of subgoal concepts, considered in combination, constitute a *plan*. (For similar conceptualizations, see Miller, Galanter, & Pribram, 1960; Schank & Abelson, 1977.) The subgoals that compose a plan are often associated with a sequence of more specific subgoals, and so on. Thus, a simplified plan–goal hierarchy implied by these assumptions might resemble that shown in Fig. 1.

A goal concept and the plan for attaining it may be conceptualized as a prototypic event schema (Wyer, 2004; Wyer & Radvansky, 1999) or script (Graesser, 1981; Schank & Abelson, 1977) that is stored in memory as a conceptual unit. Thus, as Kruglanski et al. (2002) have found, the use of a goal concept can increase the accessibility in memory of subgoal concepts that specify a means of attaining the objective to which it refers. Correspondingly, the use of a subgoal concept can activate the concept of a higher order goal that it exemplifies.

Two complications arise in conceptualizing this hierarchy, however, which are recognized by Kruglanski et al. (2002) and are reflected in the constructs of *equifinality* and *multifinality*. First, several alternative plans may be associated with the same goal. (More simply, there is often more than one way to attain a particular objective.) The goal of comparing two choice alternatives, for example, could be attained by either (a) computing an overall evaluation of each and comparing these evaluations or (b) determining the number of dimensions on which one alternative is superior to the other. Second, a subgoal concept can be a component of more than one plan, each of which is relevant to a different goal. For example, a comparison of alternatives is involved in both deciding which of two persons to invite for dinner and deciding which of two products to buy.

#### Processing assumptions

The importance of the preceding observations derives from the possibility that the activation of one concept in the course of engaging in goal-relevant behavior can increase the accessibility in memory of more general concepts that are associated with it. This, in turn, can increase the likelihood that these concepts come to mind in a later situation to which they are applicable. Thus, in the preceding example, making dimension-by-dimension comparisons in the course of deciding which of two persons to date may increase the likelihood that concepts associated with a similar process come to mind in a purchase situation that one encounters a short time later.

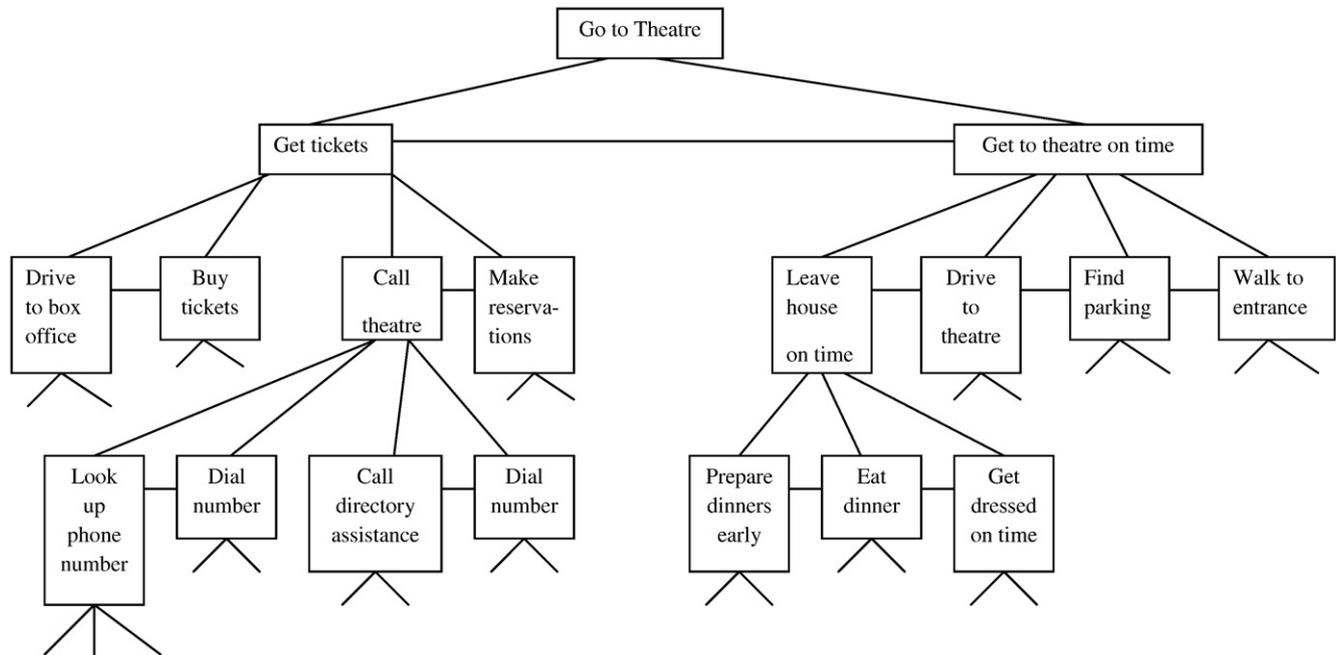


Fig. 1. Simplified hierarchy of goal and subgoal concepts associated with going to the theater.

A specification of the conditions in which this occurs obviously requires assumptions about the determinants and effects of knowledge accessibility. Although numerous theories have been proposed to account for these phenomena in both cognitive and social psychology (for reviews, see Förster & Liberman, 2007; Higgins, 1996; Wyer, 2004, 2008; Wyer & Srull, 1989), they converge on four general principles.

**P1.** Individuals are unlikely to consider all of the knowledge they have acquired in attaining a goal to which it is relevant. Rather, they use only a small subset of this knowledge that comes easily to mind without considering other knowledge that might be equally applicable.

**P2.** The likelihood that a concept or unit of knowledge is activated and applied in goal-directed activity is a function of (a) the similarity of its features to those of the situation in which the activity is performed, (b) the similarity of its features to those of other concepts that happen to be accessible in memory, (c) the *recency* with which it has been activated and applied in the past, and (d) the *frequency* with which the concepts have been applied in the past.

**P3.** The influence of accessible concepts and knowledge on information processing typically occurs without awareness of the reason why the concepts and knowledge have come to mind.

**P4.** Once concepts and knowledge have been applied to information in the course of goal-directed processing, they are likely to influence later judgments and decisions independently of this information (Carlston, 1980; Lingle & Ostrom, 1979; Srull & Wyer, 1979, 1980).

#### Chronic accessibility of knowledge

One implication of Principle 2 is worth noting. That is, the likelihood of retrieving a concept or knowledge unit can be influenced by not only the recency with which the concept has

been used in the past but also the frequency with which it has been applied. This means that when individuals have employed a particular concept or body of knowledge (e.g., a procedure) very frequently in the course of their past experience, it becomes *chronically* accessible in memory and, therefore, is likely to be brought to bear on judgments and decisions without considering equally applicable alternatives. The effects of situationally induced knowledge accessibility and the effects of chronic knowledge accessibility are similar and can combine additively to influence the use of this knowledge (Bargh, Bond, Lombardi, & Tota, 1986). This is true of procedures as well as semantic concepts (Wyer, Hung, & Jiang, 2008). The relevance of this and other principles becomes clear presently.

#### Determinants of overt behavior

A complete conceptualization of goal-directed processing must specify the link between the deliberative use of declarative knowledge to decide which strategy to use to attain an objective and the cognitive and motor behavior that is required to implement the decision. Much of this behavior may be performed automatically once the decision to engage in it is made. Although several conceptualizations address this matter (Anderson, 1983; Dijksterhuis & Bargh, 2001; Strack & Deutsch, 2004; Wood & Neal, 2007; Wyer, 2004), a conceptualization similar to that proposed by Anderson (1983; see Smith, 1984, 1990, 1994) is particularly useful. According to this conceptualization, individuals acquire through learning a number of “if [X], then [Y]”, or “[X]→[Y]” productions, where [X] is a configuration of external or internally generated stimuli and [Y] is a sequence of cognitive or motor acts that are elicited and performed automatically when the preconditions specified in [X] are met. This precondition can include a specification of a goal along with features of the immediate situation and, in some instances, tangentially relevant cognitions that happen to be

accessible in memory at the time. As an example, someone who is driving to the supermarket might consciously determine where to go by looking for street signs and other landmarks. However, the motor behavior of turning right or left, or stopping at a red light, may be guided by a production (e.g., [supermarket, “Prospect Street,”...]*à*[activate turn signal, slow down, turn steering wheel,...]), that is performed automatically.

Note that individuals respond to the precondition that elicits a production configurally, without necessarily articulating its individual features. Therefore, the configuration can include features of which individuals are unaware. Moreover, it can activate a sequence of behavior automatically, without consciousness of the reason for doing so or of how the behavior is performed. To this extent, the construct of a production is potentially useful in accounting for a wide variety of behavior, including those attributed to unconscious goal activation (Chartrand & Bargh, 1996), and a “perception–behavior link” (Dijksterhuis & Bargh, 2001) as well as several phenomena identified in consumer research (e.g., Shen & Wyer, 2008b). A more detailed conceptualization of these and other phenomena in terms of productions is provided elsewhere (Wyer, Shen, & Xu, *in press*). In this article, however, we focus largely on processes that are governed by the conscious use of declarative knowledge.

#### *The nature of mind-sets*

As we define it in this article, a mind-set reflects the activation and use of a procedure that is stored in memory as part of declarative knowledge. To this extent, its operation can be conceptualized in terms of the principles of knowledge accessibility noted earlier. The decision to pursue a particular objective can be stimulated by both external factors (e.g., situational demands, or a reminder of something that needs to be done) and internally generated motives (e.g., hunger, boredom, etc.). In either case, individuals presumably identify a goal concept in memory that pertains to this objective and this concept, in turn, activates a plan for attaining it. The first subgoal they identify in the course of considering this plan stimulates the activation of a “subplan” that is associated with this subgoal, and the decision to use this subplan may activate still other plans. When the goal specified at any given level of the goal hierarchy has been attained (perhaps through the use of a production, as described earlier), the next subgoal in the plan is consciously identified and, if situational conditions permit, a plan to attain this subgoal is activated. If the subgoal cannot be pursued immediately, the activity is typically deferred.

Our previous discussion implies that the implementation of a plan for attaining a particular goal not only activates the subgoal concepts involved in this plan but also can increase the accessibility in memory of subgoal concepts at a higher or lower level of generality. For example, the concepts activated by comparing the physical attributes of two animals could also activate concepts associated with a general procedure of making comparative judgments. Therefore, if these latter concepts are also applicable to a quite different objective (e.g., deciding which of several products to buy), the plan that contains them becomes more likely to be activated. Thus, people’s goal-

directed behavior in one situation (or the cognitions activated by engaging in it) can influence the behavior they later perform in the pursuit of objectives that are quite unrelated to the goal to which their original behavior was relevant. This influence is evidence of a mind-set.

Our conceptualization distinguishes a mind-set from the effects of past behavior on the activation of a production as described earlier. That is, concepts that are activated by performing an activity in one situation can be included in the precondition of a production that automatically elicits cognitive or motor behavior in a different situation (Anderson, 1982, 1983; Shen & Wyer, 2008b; for further discussion, see Wyer *et al.*, *in press*). In this case, the “mind” does not come into play. In contrast, although individuals may not be conscious of the reason they have selected one course of action rather than another for use in pursuing a particular goal, and thus may not be aware of the mind-set that is governing their behavior, they are nonetheless aware of the strategy they are using. Moreover, the sequence of goal-related decisions that are involved in employing the strategy is made consciously and deliberately.

As we have noted, mind-sets can come into play at several stages of processing, including comprehension, judgment, and decision making. They may be activated by externally imposed goals or internally generated ones. A representative sample of the mind-sets we will consider in this article is summarized in Table 1. We now turn to a review of research, much of it performed in our own laboratory, that bears on their effects.

### Comprehension processes

Individuals who receive information for a particular purpose often interpret it in terms of semantic concepts and knowledge.

Table 1  
Representative behavioral mind-sets at different stages of processing.

Comprehension	
1.	Holistic vs. piecemeal—the interpretation of different pieces of information about an object as a configuration vs. separately from one another
2.	Relational thinking—the interpretation of components of information in relation to one another vs. independently
3.	Visual vs. verbal—the construction of visual images on the basis of information vs. the extraction of its semantic meaning
Evaluation	
1.	Counterarguing vs. bolstering—the generation of arguments against the validity of information’s implications vs. the generation of supportive elaborations
2.	Counterfactual thinking—the generation of alternative reasons why an existing situation might not have occurred or a proposition might not be true
Decision making	
1.	Deliberative vs. implemental—a consideration of whether to pursue an objective vs. a consideration of how to do so
2.	Which-to-choose—a consideration of which of several alternatives to select without considering the possibility of selecting none
3.	Variety seeking—the selection of different options over a series of trials vs. the repeated selection of the same option
Motivation-activated mind-sets	
1.	Acquisition—the decision to acquire vs. not to acquire objects
2.	Promotion vs. prevention—attention to the positive consequences of a decision vs. attention to the avoidance of negative consequences
3.	Uncertainty avoidance—the selection of options that minimize the uncertainty of the outcome

The concepts used are often those that are accessible in memory at the time (Higgins, Rholes, & Jones, 1977; Srull & Wyer, 1979, 1980). For example, they might interpret the product attribute, “artificial sweeteners added” as either “tasty” or “unhealthy,” depending on which of these concepts come to mind most quickly and easily (Park et al., 2001). As Smith (1990, 1994) points out, however, the way in which people comprehend information could also reflect the cognitive procedure that is employed. When several different comprehension strategies are applicable, the choice of one strategy over another may depend on which comes to mind most easily. To this extent, the comprehension of information in pursuit of one objective may induce a mind-set that influences the comprehension of quite different information in pursuit of a different goal in a later situation. Studies in several areas exemplify this possibility.

#### *Holistic vs. piecemeal mind-sets*

In a study by Higgins and Chaires (1980), participants were initially exposed to a series of pictures each depicting a container and its contents (e.g., a plate with some candies on it). In some conditions, however, the caption describing each picture contained the word “of” (i.e., “a plate of candies”), and in other cases, it contained the word “and” (“a plate and candies”). Thus, the first caption induced a holistic mind-set—a disposition to encode the container and its contents into memory as a unit—whereas the second induced a piecemeal mind-set—a disposition to interpret the object’s attributes independently of one another.

Participants after viewing the pictures were asked as part of a different study to solve the Düncker candle problem. That is, they were given a box containing tacks and a small candle and were told to mount the candle on a wall so that it could be lit. The problem can be solved by using the box as a base for mounting the candle and then tacking it onto the wall. To arrive at this solution, however, one must cognitively dissociate the box from its contents. The problem, therefore, was solved more quickly by participants in the “and” condition, who had been primed with a disposition to think about a container and its contents as separate entities, than by those in the “of” condition.

#### *Abstract thinking mind-sets*

People may have a disposition to encode information in terms of abstract concepts (e.g., “animal”) or specific ones (“collie”). Their use of these concepts in the pursuit of one objective can induce a mind-set that generalizes to other goal-directed activity in which this comprehension strategy is potentially applicable.

An interesting example of the first possibility was provided by research stimulated construal-level theory (Trope & Liberman, 2003). That is, individuals have a disposition to evaluate events in more abstract terms if they are temporally distant than if they are proximal. To this extent, performing a task that requires thinking about the near or distant future could stimulate a disposition to encode information concretely or abstractly that generalizes to later, quite unrelated situations. In a series of

studies by Wakslak, Trope, Liberman, and Aloni (2006), for example, some participants were led to believe that the experimental task they were performing would not be completed until some time in the future, thereby creating a disposition to process information in terms of abstract concepts. These participants later performed better on a task that required the abstraction of stimuli from a complex background, but performed less well on tasks that required attention to details, than individuals who believed that the first task would be completed within the same experimental session.

An abstract thinking mind-set can also be influenced by the language that individuals use to describe themselves and others. As Semin and Fiedler (1988) note, the use of adjectives (“A is aggressive”) to describe behavior is more abstract than the use of verbs (e.g., “A hit B”). To this extent, the use of adjective descriptors could induce a mind-set that generalizes to other, quite different situations. In a study by Stapel and Semin (2007), for example, participants watched a short film in which chess pieces moved in ways that were conducive to an anthropomorphic interpretation of what went on. Then, some participants described the pieces’ personalities whereas others described their behavior. Then, in a later task, participants were asked to indicate which of two geometric figures—a large square that was formed from a number of smaller triangles or a large triangle that was formed from a number of smaller squares—was more similar to a target figure (a triangle or a square). Participants were more likely to base their judgment on the target’s similarity to the large figure if they had generated personality (i.e., adjective) descriptions in the first task than if they had generated behavior (verb) descriptions.

#### *Relational thinking mind-sets*

Individuals who receive a number of pieces of information could potentially encode each piece of information independently. Alternatively, they could consider the information items in relation to one another or to the context in which they occur. (People who encounter a male and female couple, for example, could describe them either individually, as a “man” and a “woman,” or in terms of their marital or social relationship.) The use of these thinking styles in one situation could activate a mind-set that generalizes to the processing of stimuli in quite unrelated situations. These mind-sets could be either situationally induced or chronic.

#### *Situationally induced mind-sets*

In an experiment by Kim and Meyers-Levy (2007), some participants were first given a series of stimuli with instructions to form a mental representation of the features of each stimulus individually. Others were told to organize the stimuli into groups that were similar to one another, and still others were told to group them “in such a way that stimuli in one category were different from those in the other categories.” Then, as part of an unrelated study, participants were given an ad for a vacation resort that was described in terms of features related to both price and quality. Later, they recalled the features in the ad. Participants’ recall protocols indicated that the strategy they had

used to process information in the first task generalized to the second. That is, the recalled items were clustered to a greater extent in terms of the general category to which they belonged when participants had been primed to think relationally than when they had been primed to consider stimuli individually. Furthermore, this was true regardless of whether the primed relationship pertained to similarity or dissimilarity. Relational thinking apparently played a role in judgments of the target stimulus as well.

Particularly interesting in this context is the possibility that inducing individuals to think about *themselves* either independently or in relation to others can activate a mind-set that influences their processing of information in a later situation in which their self perceptions are quite irrelevant. In a study by Kühnen, Hannover, and Schubert (2001), some participants were asked to think about differences between themselves and their family and friends, thereby activating an independent thinking mind-set. Others were asked to think about what they had in common with their family and friends, activating a relational thinking mind-set. All participants then performed an embedded figures task that required them to separate the simple figures from the context in which they were embedded. Participants took less time to perform this task if they had an independent-thinking mind-set than if they had a relational thinking mind-set.

As Kühnen et al. (2001) note, the procedures that characterize independent thinking and relational thinking mind-sets may be activated indirectly by semantic concepts that pertain to oneself as an individual or, alternatively, as a member of a group. Two studies by Kühnen and Oyserman (2002) suggest this possibility. Participants initially performed a task that required them to circle either first person singular pronouns (“I,” “me,” etc.) or first person plural pronouns (“we,” “us,” etc.) in a passage they were reading. Using “we” presumably requires thinking of oneself in relation to other persons, whereas using “I” requires thinking about oneself as independent of others. Participants in one study were then exposed to a configuration of small letters on a computer screen that were arranged to form a larger, different letter and were asked to identify either the large letter or the small one by pressing a key on the keyboard. Participants took less time to identify the large letter when they were primed with “we” than when they were primed with “I,” suggesting that they were relatively more disposed to focus on contextual features of the information in the former condition. Correspondingly, they took longer to identify the small letter in the first condition than in the second.

Participants in a second study were shown an array of 28 objects (a house, a moon, etc.), after which they were given a blank sheet of paper and asked to write the names of the objects in the positions they were shown. Priming had little influence on the actual number of objects recalled. However, participants who were primed with “we” were relatively more accurate in positioning the objects on the page in relation to one another.

#### *Chronic mind-sets*

Although dispositions to think about oneself independently or interdependently can be situationally induced, chronic

dispositions can also exist as a result of social learning. In fact, cultural differences in these self-construals are widely recognized (Markus & Kitayama, 1991; Triandis, 1989). Specifically, European Americans are typically disposed to think of themselves as independent whereas East Asians tend to think of themselves in relation to others. If these dispositions are chronic, they could potentially influence the comprehension of stimuli in a number of quite different domains.

Numerous studies by Nisbett and his colleagues (for reviews, see Nisbett, 2003; Norenzayan, Choi, & Peng, 2007) confirm this speculation. For example, European Americans, who typically construe themselves as independent, have a disposition to group social stimuli on the basis of their category membership, whereas Asians, who characterize themselves as interdependent, tend to group stimuli on the basis of their relationship to one another (Ji, Zhang, & Nisbett, 2004). Thus, for example, European Americans who are asked to group a man, woman, and a baby typically place the two adults together, whereas Asians group the mother and the baby.

Asians' chronic disposition to think relationally is also evidenced by their sensitivity to the context in which stimuli are presented. For example, Asians spend more time than Americans looking at background features of a visual display (Chua, Boland, & Nisbett, 2005) and are relatively more sensitive to changes in these features (Masuda & Nisbett, 2001). At the same time, they are relatively less likely to ignore irrelevant contextual cues in performing a perceptual task. In a particularly interesting experiment, Park, Nisbett, and Hedden (1999) asked Asian and American participants to read a series of words, each of which was presented on a separate card. In some conditions, only the word was presented on each card. In other conditions, the word was surrounded by pictures of people and objects that were irrelevant to the word's meaning. Later, participants were asked to recall the words they had read. One might expect the irrelevant context stimuli to be distracting and to decrease participants' attention to the words. In fact, however, Asians' recall of the words was actually *greater* when the contextual stimuli were presented. This was not true of the Americans.

The evidence that independent and relational thinking processing styles not only characterize individuals with different cultural backgrounds but can be experimentally induced confirms our speculation that both social learning and situation-specific factors can induce a behavioral mind-set that governs comprehension in a wide variety of situations that are unrelated to the conditions that gave rise to its induction. The next set of studies provides further support for this possibility.

#### *Visual vs. verbal comprehension processes*

Advertisements typically convey information both verbally and in pictures. To comprehend this information and to integrate its implications to form an impression of the product as a whole, at least two general processing strategies might be applied. On one hand, consumers might encode the information of each type in terms of semantic concepts and combine the evaluative implications of these semantic codings to form an overall judgment in the manner suggested by theories of information

integration (N. Anderson, 1971, 1981). Alternatively, they might encode the information visually and construct an overall visual image of the product as a whole, evaluating the product on the basis of this image. The judgments that result from applying these strategies can differ.

The manner in which information is processed may depend in part on the way in which it is presented (Adaval & Wyer, 1998; Adaval, Isbell, & Wyer, 2007; Wyer, Adaval, & Colcombe, 2002). However, it can also be influenced by a mind-set that is activated before the information is received. Moreover, this mind-set may be either chronic or situationally induced.

#### *Effects of image familiarity on comprehension and judgment*

When information is conveyed verbally, individuals with a verbal processing mind-set (*verbalizers*) presumably construe its implications on the basis of semantic concepts they retrieve from memory, whereas individuals with a visual processing mind-set (*visualizers*) construct a visual image of the information in the course of construing its implications (e.g., a situation model; see Wyer, 2004; Wyer & Radvansky, 1999). To the latter extent, however, the difficulty of comprehending the information should depend on the ease with which these visual images are formed. This, in turn, may depend on the familiarity of the information's referent and, therefore, on the similarity of the image it elicits to previously formed images that are stored in memory.

Yuwei Jiang and his colleagues confirmed this difference and its impact on judgments. In one set of studies (Jiang & Wyer, 2009), male and female participants were categorized as either chronic visualizers or chronic verbalizers on the basis of Childers, Houston, and Heckler's (1985) Style-of-Processing scale. These participants were presented a series of both meaningful and anomalous statements on a computer with instructions to indicate whether each statement was comprehensible. Some of the comprehensible statements referred to a person (a) going into the men's room, (b) going into the ladies' room, (c) coming into the men's room, or (d) coming into the ladies' room. A visual image of the events described by the first two statements would presumably be formed from the perspective of someone outside the room, whereas the image of the events described by the second two statements would be formed from the perspective of somebody inside.

Persons with a chronic visual processing mind-set were expected to have difficulty imagining an event from a perspective that was unfamiliar. Thus, male visualizers should have difficulty comprehending the statement that "a person came into the ladies' room." Correspondingly, female visualizers should have difficulty comprehending the statement that "a person came into the men's room." Differences in comprehension time confirmed this conjecture. Male and female visualizers did not differ in the time they took to comprehend statements that described someone going into a restroom regardless of the type of room described. However, male visualizers took significantly longer to comprehend a statement that described a person coming into the ladies' room than a statement describing someone coming into the men's room,

whereas female visualizers took significantly less time to comprehend the first statement than the second. In contrast, these differences were not evident among persons with a verbal processing mind-set.

A second series of studies, which had more direct implications for consumer judgment, confirmed the assumption that visual and verbal processing mind-sets could be induced situationally as well as being chronic (Jiang, Steinhart, & Wyer, 2009; see Wyer, Hung, & Jiang, 2008). In these studies, either a verbal or a visual processing mind-set was induced by asking participants to perform either a hidden word task or a hidden figures task, respectively. Chronic mind-sets were assessed using the Childers et al. (1985) scale. Induced and chronic mind-sets had virtually identical effects.

In one pair of studies, for example, individuals were given a verbal description of a computer mouse. Some participants were told that it was a standard mouse of the type with which they were familiar. Others were told that it was a "trackball" mouse that was primarily used in computer graphics and was generally unfamiliar. The verbal attribute descriptions were the same in all cases. Individuals with a visual processing mind-set apparently attempted to construct a visual representation of the mouse to use as a basis for evaluating it. However, they found it difficult to accomplish this when the product was unfamiliar and a previously formed visual representation of the product did not exist in memory. Consequently, as shown in Table 2, they evaluated the trackball mouse less favorably than the standard one. (For evidence that difficulty in processing information decreases evaluations of the object it describes, see Schwarz, 1998, 2004; Winkielman & Cacioppo, 2001; Winkielman, Schwarz, Fazendeiro, & Reber, 2003). In contrast, individuals with a verbal processing mind-set comprehended the product information without attempting to form visual images and evaluated the products similarly regardless of their familiarity. Furthermore, as Table 2 shows, the effects were virtually identical regardless of whether the mind-sets were situationally induced or chronic.

These considerations also imply that if a picture of the unfamiliar product is presented, it should have a greater effect on individuals who are primed to process information visually but should have little effect on those who are disposed to process information verbally. Data presented in Table 2 confirmed this possibility as well. That is, a picture had an appreciable influence on visualizers' evaluations of an unfamiliar product but had little

Table 2

Mean product evaluations as a function of product familiarity, the presence of a picture, and mind-set (based on data from Jiang et al., 2009).

	No picture		Picture	
	Visual mind-set	Verbal mind-set	Visual mind-set	Verbal mind-set
Situationally induced mind-set				
Familiar mouse	5.02	5.00	5.33	5.82
Unfamiliar mouse	3.63	5.02	5.21	4.08
Chronic mind-set				
Familiar mouse	4.52	4.57	5.22	5.45
Unfamiliar mouse	2.97	4.78	4.17	3.74

effect on their evaluations of a familiar one. In contrast, the presence of a picture decreased verbalizers' evaluations of the unfamiliar product, suggesting that it interfered with the processing of the verbal descriptions.

A second set of studies (Jiang et al., 2009; see Wyer et al., 2008) provided further evidence of the impact of a visual processing mind-set on comprehension difficulty. In this case, the difficulty did not result from the unfamiliarity of the stimuli themselves but, rather, from the integration of different pieces of information into a coherent picture of the stimulus as a whole. Participants read an ad for a hotel containing both a verbal description of its interior and a verbal description of its exterior. In some conditions, each description was preceded by a picture of the same general location. In other conditions, the descriptions were each preceded by a picture of a different location. Thus, the information was the same in all cases but varied in the order in which it was conveyed. When individuals had either a situationally induced or chronic disposition to process information verbally, they evaluated the hotel similarly in all cases. However, individuals with a visual processing mind-set, who were disposed to construct a coherent visual image of the hotel as a whole, found this more difficult to do when the verbal descriptions were preceded by pictures taken from a different location, and this difficulty in processing led them to evaluate the hotel less favorably.

#### Effects on emotional reactions

A different effect of visual mind-sets on judgments is particularly interesting. People are likely to have more extreme emotional reactions to an event if they are present in the situation in which the event occurs than if they are not. To this extent, they should also have more extreme reactions to events that they *imagine* from the perspective of someone in the situation described than to events they imagine from the perspective of an outside observer. To this end, Jiang and Wyer (2009) asked participants to read and comprehend descriptions of positive or negative events that were written from the perspective of either someone in the situation (e.g., "The actress came into the room and sang a beautiful song," "The drunk came into the kitchen and threw up on the floor," etc.) or someone outside ("The actress went...," "The drunk went...") and, in each case, to rate the favorableness of their reactions to the event described.

These reactions are summarized in Table 3. Persons with a chronic visual processing mind-set reported more extreme reactions to events when they were described from the perspective of someone in the situation than when they were described from the perspective of someone outside. That is, they had more favorable reactions to positively valenced events, and more unfavorable reactions to negatively valenced events, in the first case than in the second. In contrast, individuals with a verbal processing mind-set reported similar reactions regardless of the perspective from which the statements were written.

It is worth noting that in additional conditions of this study, participants were explicitly asked to imagine the event described in each statement before reacting to it. As shown in the bottom half of Table 3, all participants in these conditions

Table 3

Mean reactions to favorable and unfavorable event descriptions as a function of mind-set and the perspective from which the events are described (based on data from Jiang & Wyer, 2009).

	Visual mind-set		Verbal mind-set	
	Favorable Descriptions	Unfavorable Descriptions	Favorable Descriptions	Unfavorable Descriptions
<i>Comprehension Instructions</i>				
Inside perspective	2.92	-3.92	2.19	-2.31
Outside perspective	2.42	-3.05	2.25	-2.64
$M_{\text{diff}}$	0.50	-0.87	-0.06	0.33
<i>Imagination Instructions</i>				
Inside perspective	2.82	-3.27	2.87	-3.55
Outside perspective	2.41	-2.79	2.45	-2.95
$M_{\text{diff}}$	0.41	-0.48	0.42	-0.60

made more extreme reactions to events that were described from an inside perspective regardless of their chronic disposition to form visual images. These results confirm the assumption that people normally have the *ability* to process information visually if they are explicitly called upon to do so. In the absence of situational demands, however, a chronically accessible mind-set is likely to guide their comprehension of the information.

#### Interference effects of mind-sets on processing

In the studies by Jiang and his colleagues, visual and verbal comprehension processes were equally applicable to the task that participants performed. When the task to be performed requires a different processing strategy than the one that is applied in a previous situation, the mind-set that is activated by the behavior performed in this situation could have an interference effect. This interference is suggested by research on "verbal overshadowing" (Dodson, Johnson, & Schooler, 1997; Schooler & Engstler-Schooler, 1990). In a particularly provocative study (Dodson et al., 1997), participants were first exposed to a series of faces and then were asked to describe one of the faces verbally. Generating this description increased participants' difficulty in recognizing not only this face but also other faces they had seen but had not described verbally. Dodson et al. concluded that verbally encoding the face in the course of describing it activated a verbal processing strategy that interfered with the visual processing that was necessary for accurate recognition of the faces that participants encountered subsequently. Furthermore, this interference generalized to stimuli other than the one to which the verbal encoding strategy had been applied.

#### Evaluation processes

##### Counterarguing and bolstering mind-sets

The comprehension of information is often a precondition for other goal-directed cognitive activity and so the influence of mind-sets on the cognitive strategies that individuals apply at this stage of processing is likely to be particularly wide spread. However, mind-sets obviously come into play at later stages of

processing. Once individuals receive and comprehend a communication, for example, they may often elaborate its implications with reference to their previously acquired knowledge about the topic at hand. Alternatively, they may attempt to counterargue or to refute its validity. This disposition may be stimulated in part by individuals' a priori belief in the validity of the position being advocated or their evaluation of its desirability. The performance of this cognitive activity, however, may activate a more general procedure that, once accessible in memory, influences the strategy that individuals apply in responding to information they receive subsequently for a quite different purpose.

A recent series of studies by Xu (2010) provides a compelling demonstration of this possibility. Participants in one study were asked to list their thoughts about each of three propositions. In some cases, the propositions were worded in such a way that led participants to agree with them (e.g., "Reading enriches the mind," "The University of Illinois should not increase tuition fees," etc.) In other cases, they were worded in a way that led participants to disagree with them ("Reading is bad for the mind," "The University of Illinois should increase tuition fees," etc.). Participants listed similar thoughts about the issue to which the propositions pertained regardless of how the propositions were worded. However, the thoughts were likely to support the propositions in the first case and, therefore, to induce a *bolstering* mind-set, but to oppose the propositions in the second case and to induce a *counterarguing* mind-set. A third, control group of participants generated thoughts about evaluatively neutral propositions.

After completing their thought listings, participants as part of an unrelated experiment read an advertisement for a vacation spot and evaluated its desirability along a scale from 0 to 10. The descriptions of the vacation were attractive in one condition and relatively unattractive in the other. Regardless of the vacation's a priori attractiveness, however, participants evaluated it more favorably when they had listed supportive thoughts in the priming task ( $M=6.80$ ), and less favorably when they had listed counterarguments ( $M=5.13$ ), than they did in control conditions ( $M=5.76$ ). These differences were significant but were reduced to nonsignificance when the relative number of supportive (vs. refutational) thoughts that participants had generated in the priming task was controlled.

The evidence that counterarguing and bolstering mind-sets can be situationally induced has further implications, which Xu (2010) has also explored in her dissertation. For example, the effectiveness of a donation appeal may depend on whether recipients elaborate the seriousness of the problem to be remedied or counterargue the importance of the benefits that a donation would provide. To this extent, a recent, unrelated conversation with a colleague in which one has either supported or opposed a position (e.g., the need for more marketing faculty) might affect the likelihood of making a contribution.

A more interesting extension is suggested by the possibility that bolstering and counterarguing mind-sets can influence responses not only to new information one receives but also to previously acquired concepts and knowledge that one has already acquired and stored in memory. Fishbein and Ajzen

(1975) assume that individuals' behavior is determined in part by their attitude toward the behavior. However, if individuals recall a previously formed attitude and assess its implications for a behavioral decision, the influence of the attitude should depend on whether individuals accept these implications or, alternatively, question their validity. Inducing a bolstering or counterarguing mind-set in a previous situation could influence the likelihood of these cognitive responses. Xu (2010) is currently exploring this possibility as well.

#### *Counterfactual thinking mind-set*

Counterarguing requires the generation of reasons why a proposition is not true or a state of affairs could not occur. A closely related process may be the generation of counterfactuals, that is, reasons why a situation that actually occurred might not have. The generation of counterfactuals requires consideration of alternative possibilities. To this extent, it might induce a mind-set that increases the likelihood of considering alternative possibilities in a later situation. As a result, it might decrease confidence and might decrease the extremity of predictions about what might actually happen. Hirt, Kardes, and Markman (2004), for example, induced a counterfactual thinking mind-set by asking participants to generate alternative hypotheses concerning which TV sitcom would win a "best program" award. These participants later made less extreme estimates than control participants of the likelihood that a favored basketball team would win the NBA championship. Analogously, Kray and Galinsky (2003) found that inducing a counterfactual thinking mind-set led participants to recognize the disadvantages of pursuing a very attractive goal rather than considering only its advantages.

An additional consideration is raised Hirt et al.'s (2004) finding that the effects they observed were evident only among individuals with a low need for cognitive closure. Mind-sets influence the selection of an alternative processing strategy over another without consciousness of the reason for doing so. However, if the implementation of a mind-set requires cognitive effort, as in the study by Hirt et al. (2004), its effect may be overridden by motivational factors that decrease the willingness to expend this effort. The need for cognition may be one of these factors. Thus, although not all mind-sets require substantial cognitive effort, the need for closure might determine the impact of those that do.

#### **Behavioral decision making**

To reiterate, conscious goal-directed processing typically involves a series of decisions that are made en route to obtaining the objective being pursued. Individuals first decide whether to pursue the goal or not. Then, if they decide affirmatively, they select a plan for implementing it. As we have noted, however, the goal and subgoal concepts that are activated in the course of making this decision can activate other concepts at more general levels. Thus, for example, the goal directed activity that is involved in purchasing a pair of shoes could activate concepts associated with making purchases more generally or, at an even

more general level, acquiring material goods. Once these more general procedure-related concepts become accessible in memory, however, they can increase the likelihood that other exemplars of the concepts will be activated and applied in other situations to which they are applicable. Moreover, these latter situations may be quite different from those that led the general procedure to be activated.

This possibility has been recognized by Gollwitzer and his colleagues in a conceptualization of deliberative and implemental mind-sets (Gollwitzer & Bayer, 1999; Gollwitzer, Heckhausen, & Steller, 1990). They note that whereas processing at the deliberative stage entails a consideration of the pros and cons of pursuing a goal, processing at the implemental stage entails an evaluation of alternative means of accomplishing the goal once a decision to pursue it has been made. Gollwitzer et al. speculated that if individuals are stimulated to think about how to attain a goal without first considering whether they actually want to attain it, they would acquire an implemental mind-set that, once activated, might generalize to situations they encounter later.

Henderson, de Liver, and Gollwitzer (2008) obtained indirect evidence that this is the case. Participants were first asked either to consider *whether* they might pursue a particular objective or, alternatively, to plan *how* they would do so. The process of deciding whether to engage in an action typically involves a consideration of both positive and negative consequences of the action being contemplated. Consequently, it is likely to result in ambivalence about whether to take the action or not. However, considering how to pursue a goal presupposes that a decision to pursue it has already been made. In this case, ambivalence should be less. Thus, suppose participants' consideration of whether to engage in an activity and how to do so activate a deliberative and an implemental mind-set, respectively. If these mind-sets generalize to situations the individuals encounter later, the effects of the mind-sets may be reflected in the ambivalence associated with judgments in these situations.

This appears to be the case. Participants after performing the initial priming task were asked to consider a series of objects and report how ambivalent they felt about each. As expected, participants reported feeling generally more ambivalent when they had previously considered whether to pursue an unrelated objective than if they had considered how to do so. Analogous results occurred when participants were asked to report their attitude toward a social issue (i.e., making a list of convicted sex offenders available to the general public).

Gollwitzer and Bayer (1999) found another indication that deliberative and implemental mind-sets generalize over situations. That is, individuals who had adopted an implemental mind-set in the course of performing an initial task, relative to those who had been induced to adopt a deliberative mind-set, had poorer memory for incidental information that was presented in a subsequent task situation. Planning how to pursue a goal apparently activated a disposition to focus attention on information that was directly relevant to this objective while ignoring irrelevant information, and this disposition carried over to unrelated situations that individuals encountered subsequent-

ly. In yet another study (Taylor & Gollwitzer, 1995), the adoption of an implemental mind-set, which diverts individuals' attention from a consideration of whether to attain a goal, decreased their sensitivity to the risk associated with choices in an unrelated domain.

Similar considerations suggest that once individuals have decided to attain an objective, an implemental mind-set may be activated that leads persons to consider how to attain an objective in a later situation without considering whether to do so or not. In a study by Dhar, Huber, and Kahn (2007), participants at the start of an experiment were given an opportunity to purchase a pen for either a low price or a high one. They typically accepted the first opportunity but rejected the second. Later in the experimental session, they were given an opportunity to buy a moderately expensive key chain. Participants were more likely to purchase the key chain if they had decided to make a purchase earlier than if they had refused.

There are two possible interpretations of these results. First, the processing that occurs in the course of deciding to make a purchase might focus individuals' attention on positive features that were consistent with this decision (Shafir, 1993), and this evaluative bias might generalize to objects that the individuals consider subsequently. To this extent, the effects would be localized at the evaluation stage of processing. A second possibility, however, is simply that a positive purchase decision induced an implemental mind-set that was reapplied at the later, decision stage without engaging in earlier stages of processing at all.

#### *Comparative-judgment processes: Effects of a which-to-choose mind-set*

The decision processes investigated in the preceding studies consisted of only two steps: whether to engage in the activity and how to accomplish this objective. When a goal can be attained through several alternative courses of action, three decision steps are presumably involved: *whether* to pursue any alternative at all, *which* alternative to pursue, and *how* to do so. Individuals often decide whether they want to choose any option at all before they decide which one they prefer. If they have recently decided which option to choose, however, this ("which to choose") step in the sequence may be activated and applied without performing the first ("whether to choose") step. Furthermore, the performance of this step is likely to lead individuals to proceed to the next (implemental) step in the sequence without considering the option of not making a purchase at all.

The aforementioned possibility is recognized by Oriental rug salesmen, who often attempt to entice travelers into stating a preference for one rug over another under the assumption that once their customers indicate which rug they prefer, they will no longer consider the option of buying nothing. We demonstrated the success of this strategy in the laboratory (Xu & Wyer, 2007, 2008). In one study, some participants were asked to state their preference for one of two computers. Others were asked to decide whether they would want to buy one of the computers or not (without specifying which). Then both groups of participants

were given descriptions of two vacation packages, X and Y, and asked if they would be willing to choose X, to choose Y, or to defer a choice.

We assumed that reporting a preference without making an actual decision would activate a concept of deciding which option to choose that, once accessible in memory, would be reactivated and applied in a later situation without pursuing the steps that normally precede it in the decision sequence. In other words, it would induce a “which-to-choose” mind-set that increases individuals’ willingness to purchase one of the two vacation packages they encountered later without considering the option of purchasing nothing at all. This was the case; 68% of participants who had reported a preference for one of the two computers in the first situation were willing to purchase one of the two vacation packages they considered subsequently, whereas only 42% of the participants who had made a purchase decision were willing to do so. The latter percentage was identical regardless of whether participants had actually decided to purchase one of the computers in the first task or not.

Although purchase decisions in the aforementioned study were hypothetical, actual purchase behaviors can be affected similarly. In one study, for example, some participants were given descriptions of five pairs of options (restaurants, elective courses, etc.) and, in each case, indicated their preference for one of the alternatives. After the experiment was over, both these participants and those who had not performed the preference task were given an opportunity to buy one of two types of candies that had ostensibly been used as incentives in a previous study and were being sold at half price. Twenty-eight percent of the participants who had performed the preference task purchased candy, whereas only 6% of the control participants did so.

In these studies, however, both initial preferences and subsequent decisions pertained to products and services. According to our conceptualization, the application of goal concepts in a particular domain can increase the accessibility of more general concepts that they exemplify. As a result, other exemplars of these concepts may be accessed more quickly and easily, increasing the likelihood that they are applied in other goal-relevant activities to which they are relevant. Thus, in the present context, stating a preference for one of two products may exemplify a more general goal of computing a preference or, for that matter, of making a comparative judgment. If this is so, stimulating participants to pursue an objective that requires making a comparative judgment could give rise to a mind-set that is applied in situations that differ substantially from those in which the mind-set was first activated. A second series of studies (Xu & Wyer, 2008) confirmed this conjecture.

#### *Effects of choosing to reject*

In one study, participants received attribute descriptions of two vacation packages that were both either attractive or relatively unattractive. In some conditions, they stated their relative preference for the alternatives, as in the studies described earlier. In other cases, they indicated which alternative they *disliked* more. After performing this task, both these participants and participants who had not considered the vacation packages

were given descriptions of two computers and asked if they would be willing to purchase one of them or neither.

These conditions were of particular interest. Shafir (1993) found that deciding which alternative one prefers focuses attention on positive features of the alternatives, whereas deciding which alternative one dislikes more increases attention to negative features. If this is so, and if this differential attention generalizes to stimuli that participants evaluate subsequently, stating preferences should increase attraction to the choice alternatives (and thus should increase the willingness to make a purchase) whereas reporting relative disliking should decrease attraction to the alternatives (and thus decrease purchase likelihood). This is not the case, however. Participants who had reported their preference for vacation packages were more likely to choose to purchase a computer (0.73) than control participants were (0.50), and this was true regardless of whether the vacation packages were attractive (0.82) or unattractive (0.64). However, participants who had reported which vacation package they disliked more were *also* more likely to choose a computer (0.77) than control participants were (0.50), and this was also true regardless of whether the choice alternatives they had considered were attractive (0.72) or unattractive (0.82).

Note that the likelihood of choosing a computer was greater when participants had reported either their preference for attractive vacations or their relative dislike for unattractive vacations (0.82) than when they had reported their preference for unattractive vacations or their relative dislike of attractive ones (0.68). Comparative judgments may have been easier to compute in the former cases than in the latter, and so the mind-set activated by these judgments may have been stronger (Schwarz, 2004).

#### *Effects of comparing animals on product and dating choices*

A second series of studies (Xu & Wyer, 2008) provided further support for the generality of a which-to-choose mind-set over content domains. In one study, participants in *preference-judgment* conditions were exposed to ten pairs of wild animals (an elephant vs. a hippopotamus, a kangaroo vs. a zebra, etc.) and asked which type of animal they preferred. In a second, *attribute-judgment* condition, they were asked to compare the animals with respect to a particular attribute (i.e., which is heavier, an elephant or a hippopotamus?” “Which can run faster, a kangaroo or a zebra?”, etc.). These participants, along with control participants who were not exposed to either task, then reported their willingness to purchase computer A, computer B, or defer choice. A second study was similar except that in this case, participants were given sets of six personality trait descriptions, A and B, and were asked if they would be willing to have A, B, or neither as a dating partner. Finally, participants in a third study were given an opportunity to purchase one of a number of products (candy, chips, etc.) that had been ostensibly used as incentives in other experiments and were on sale at half price.

The effects of making initial comparative judgments, shown in Table 4, were similar in all cases. That is, participants were more likely to choose one of the alternatives described in the target task if they had either reported their preferences for

Table 4  
Effects of reporting preferences for animals and comparing their physical attributes on purchase decisions and dating partner choices (based on data from Xu & Wyer, 2008).

	Preference judgment	Attribute judgment	Control
Likelihood of choosing product	0.64	0.68	0.40
Likelihood of choosing dating partner	0.75	0.70	0.47
Likelihood of making an actual purchase	0.51	0.52	0.37

animals or had compared them with respect to a physical attribute than under control conditions, and this was true regardless of whether the alternatives pertained to computers or dating partners. Moreover, participants' likelihood of actually purchasing a product after the experiments showed an identical pattern.

#### Similarity comparisons

A final study provided further evidence of a comparative-judgment mind-set. In this study, participants before making product choices were given 20 pairs of objects in four different domains (countries, educational institutions, animals, and public figures) and were asked in each case to indicate how similar one was to the other (i.e., "How similar is Korea to China?", "...Hitler to Stalin?", etc.). We assumed that these judgments would typically require a comparison of the features of one alternative to the second and, therefore, would also activate a comparative-judgment process. This was the case. Making similarity judgments increased the proportion of participants who were willing to purchase a computer from 0.50 to 0.85.<sup>2</sup>

The generality of a comparative-judgment mind-set and its impact on actual purchase decisions raise an interesting possibility. That is, the consumption of material goods may be greater during election years, when citizens are continually being asked which of two political candidates they prefer, than in off-election years. Preliminary data bearing on the latter speculation are suggestive. An analysis of the US personal consumption expenditures between 1929 and 2002 (converted to real 1996 dollars) revealed that the average expenditure during presidential election years was 2.2% greater than the average expenditure in the years immediately preceding and immediately following them (\$2458 billion vs. \$2406 billion). More strikingly, an analysis of total retail store sales during the 3 months prior to the election (August, September, and October) was 9.4% higher during the election years between 1953 and 2000 than it was during comparable periods of the years before and after the election (\$285 billion vs. \$260 billion). Although these differences are not statistically significant, their consistency with expectations is provocative.

<sup>2</sup> Not all similarity judgments may involve a comparison process. Suppose people are asked to assess the overall similarity of two objects rather than to judge how similar one object is to the other. Although the two tasks appear to be similar on the surface, the first task may be performed by extracting the proportion of features that the two objects have in common without making a direct comparison. In this case, the effects we observed should not be evident.

#### Variety seeking mind-sets

A quite different type of decision situation in which mind-sets come into play was investigated by Hao Shen. Individuals often have occasion to choose several articles of a given type for use over a period of time. Grocery shoppers, for example, may stock up on items for use over several days in order to avoid numerous trips to the store. Vacationers may take a number of books to read on a trip or a number of DVDs to play. In such situations, individuals may sometimes be inclined to select the same type of item (e.g., the type they prefer most) for use on each occasion. In other cases, they may choose a variety of items.

These different strategies can depend in part on the type of item being considered. For example, people are likely to choose the same brand of beer or bottled water for use on each day of the week but to choose different kinds of vegetables to eat for dinner each evening. In other cases, however, individuals may not have a clear a priori preference for diversity. In these cases, their disposition to choose diversity may depend in part on factors that induce them to make the same or different responses repeatedly in a previous situation.

The experiments by Shen and Wyer (2010) support this conjecture. Participants performed an initial task in which one of two decision strategies was employed, and the effect of performing this task on the strategy they used in a second task was determined. Three variables were manipulated: (a) the similarity of the initial task to the later one, (b) the decision strategy that participants employed in the first task, and (c) the salience of this strategy at the time they performed the second task. Specifically, some participants indicated the food they would be likely to purchase over a 4-day period. In some conditions, the domain (bottled water) was one in which they were likely to choose the same option on each day. In other conditions, the domain (vegetables) was one in which they were likely to choose a different option on each day. A second set of conditions were analogous but the task was totally unrelated to food or drink. That is, participants were asked questions about four animals (a dog, a tiger, a chicken, and a pig). The questions varied in such a way that in one condition, participants gave the same answer to each question ("Which animal is largest?", "Which animal is most ferocious?", etc.) and in a second condition they have a different answer to each question ("Which animal is largest?", "Which animal is most loyal?", etc.).

After completing this task, participants as part of an ostensibly different experiment were told to assume that they were shopping for herbal tea and to indicate which of four brands they would choose to drink on each of the next 4 days. We assumed that the first task that participants performed would induce a mind-set to choose the same option repeatedly or different options repeatedly, this would generalize to the second task they performed. Data summarized in Table 5 confirmed this expectation. When participants performed the second task without thinking about the first one, the mind-set induced by the first task influenced the strategy they employed regardless of the two tasks' similarity. That is, the diversity of the responses to items in the first task had a generally positive influence on the

Table 5  
Variety seeking as a function of primed decision rule, attention to this rule, and prime relatedness (based on data from Shen & Wyer, 2010).

	No attention		Attention	
	Similar task	Dissimilar task	Similar task	Dissimilar task
Primed decision rule				
Different choice	2.90	2.90	2.89	2.63
Same choice	2.55	2.25	2.16	2.90
$M_{diff}$	0.35	0.65	0.73	-0.27

diversity of products they chose in the second task, and this was true regardless of the tasks' similarity to one another. In other conditions of the study, however, participants' attention was unobtrusively called to the diversity of the choices they had made in the first task. In these conditions, the strategy they employed in the first task affected the strategy they used in the second only if the two tasks both pertained to product choices. Participants in these conditions apparently made a conscious decision to apply the same strategy or not, depending on its relevance, and this tendency overrode the effect of the mind-set that was otherwise apparent.

#### Other decision strategies

Decision-related mind-sets could potentially influence behavior in a number of other, quite different situations. To give but one example, individuals who make a decision between choice alternatives could compute a preference in at least two ways. On one hand, they might compute the desirability of each option separately, based on an evaluation of its individual features, and then compare these overall evaluations. Alternatively, they might perform a feature-by-feature comparison of the products along dimensions they have in common and choose the alternative that is superior on the greatest number of these dimensions. The decision that is made can depend on which strategy is employed (Huber, Payne, & Puto, 1982; Park & Kim, 2005; Simonson, 1989). It is interesting to speculate that using one of these computational strategies in an initial task induces mind-set that affects the strategy employed in a second, unrelated situation. This possibility remains to be investigated.

#### Motivation-activated mind-sets

In most of the research described thus far, the goals that participants pursued, and the mind-sets that were activated by pursuing them, were stimulated by demands of the experimental tasks that the participants were asked to perform. However, these goals can be internally generated as well. For example, internally generated motivation can activate thoughts about performing a behavior, and these cognitions, like those activated by actually performing the behavior, can induce a mind-set that persists to influence behavior in later situations. This might occur even after the motive that gave rise to the mind-set no longer exists.

This possibility is suggested by research in four quite different areas, concerning (a) the effects of appetitive motives (e.g., hunger), (b) the motivation to avoid negative consequences

of a behavioral decision, (c) uncertainty avoidance, and (d) the motivational influences of affect. In each case, motivation-induced behavior appears to activate goal-relevant concepts and procedures that, once accessible in memory, influence subsequent behavior and decisions independently of the motive that gave rise to their activation.

#### Appetitive motivation and acquisition mind-sets

In a study by Wadhwa, Shiv, and Nowlis (2008), for example, individuals who had sampled a tasty drink at the beginning of an experiment made more favorable evaluations of hedonic food and nonfood stimuli that they were asked to consider subsequently. The authors assumed that sampling the drink induced a general motive that increased their liking for affect-eliciting stimuli that could satisfy this motive. A study by Brendl, Markman, and Messner (2003) has similar implications. In this study, participants evaluated a series of nonfood items either before or after eating a small amount of popcorn as part of a "taste test." Participants reported being more hungry when they had anticipated eating the popcorn than when they had actually done so. Correspondingly, they evaluated the nonfood items more favorably in the former condition. A motivational interpretation could also account for evidence that hunger increases the disposition to make impulsive purchases in a hypothetical shopping situation (Li, 2008) and decreases the willingness to give up things one has already acquired (e.g., a resistance to making donations to charities; see Briers, Pandelaere, Dewitte, & Warlop, 2006).

There is an alternative interpretation of these findings, however. That is, the process of tasting the drink early in the experiment may have induced a general disposition to acquire, or acquisition mind-set, that later influenced judgments of both food and other stimuli. This mind-set could influence judgments independently of the motivation that gave rise to its activation. A series of studies by Xu (2010) provide more direct support for the existence of such a mind-set and distinguished its effects from that of motivation per se. In an initial study, participants took part either immediately after lunch (2 PM) or shortly before dinner (6 PM). Then some participants were given a list of food and nonfood items with instructions to report the favorableness of their reactions to them along a scale from -5 (very unfavorable) to 5 (very favorable). Others were asked to indicate how much they would like to *have* the items along a scale from 0 (not at all) to 10 (very much). The motivational effects of hunger were expected to be restricted to evaluations of food-related items. If thinking about acquiring food induces an acquisition mind-set, however, it should be reflected in a disposition to acquire *both* types of products.

Results summarized in Table 6 confirmed these hypotheses. Hungry participants evaluated food items more favorably than nonhungry participants did, but their evaluations of nonfood items did not differ. In contrast, hunger significantly increased participants' desire to acquire both food and nonfood items.

Note that if the impact of hunger in the first experiment were attributable to motivational factors, the effect should be eliminated if participants' hunger is satiated. To examine this

Table 6  
Ratings of food and nonfood items by hungry and nonhungry participants (based on data from Xu, 2010).

	Evaluation		Desire to acquire	
	Food items	Nonfood items	Food items	Nonfood items
Hungry participants	1.91	2.58	5.98	7.25
Nonhungry participants	1.33	2.68	5.68	6.57
$M_{diff}$	0.58	-0.10	0.30	0.68

possibility, hungry and nonhungry (control) participants (again inferred from the number of hours they had gone without eating) were asked to indicate the desirability of acquiring the same food and nonfood items that were employed in other experiments. In some cases, however, the hungry participants were given a blind taste test in which they sampled 10 brands of crackers, thus decreasing the hunger they had been experiencing. Performing the taste test significantly reduced the hunger reported by participants relative to that reported by hungry participants who had not performed the taste test. In fact, it was nonsignificantly less than the hunger reported by control participants. Nevertheless, *both* hungry and satiated participants reported a greater desire to acquire stimulus items than control participants did and this was true for both food items and nonfood items.

In summary, Xu's studies suggest that the motivation to attain a particular objective can activate a more general, acquisition mind-set that affects responses independently of this motivation and that persists even after the motivation has been satisfied. The failure to assess actual behavior in these studies could limit their implications for the phenomena of concern in this article. However, research in three other areas provide more direct evidence that motivational factors induce a behavioral mind-set that influences decisions independently of the motivation that gives rise to it.

#### *Promotion and prevention mind-sets*

When a behavior can potentially have both positive and negative consequences, the decision to engage in it can depend on which set of consequences is weighted more heavily. To borrow an example from Briley, Morris, and Simonson (2000), suppose product A has the values +3 and -3 along two attribute dimensions and product B has values of +1 and -1 along these dimensions. In this case, a consumer who is primarily motivated by the positive consequences of a decision may choose A, whereas a consumer who is motivated to avoid negative consequences is likely to choose the compromise alternative, B.

Numerous factors can influence these motives, several of which are suggested by Higgins's (1997, 1998) formulation of regulatory focus. For example, a focus on positive decision consequences may be stimulated by a desire to attain one's self ideal, whereas a disposition to avoid negative decision consequences may result from a concern about how others would like one to be. However, the activation of these motives could induce a disposition to focus on either the positive or the

negative consequences of a decision (that is, a promotion or a prevention mind-set) that persists even after the motives have been satisfied or are no longer relevant. Furthermore, although these mind-sets can be situationally induced, they could be chronic as well. A series of studies by Briley, Morris, and Simonson (2000, 2005) and Briley and Wyer (2002) provide evidence of these possibilities.

#### *Situationally induced mind-sets*

In a series of studies by Briley and Wyer (2002), for example, participants were induced to think of themselves as either part of a group or as individuals while they performed an initial experimental task. In other conditions, both Asian and American participants' cultural group membership was made salient by exposing them to icons of either their own culture or a different one. In each case, feelings of membership in a group were expected to induce a concern about others' reactions to one's behavior and, therefore, a prevention focus. Results confirmed this expectation; both priming manipulations appeared to induce a disposition to make decisions that minimized the likelihood of negative consequences. Furthermore, this disposition generalized to situations in which individuals' group membership was not involved. That is, persons whose group membership had been made salient were more likely both to use equality as a basis for distributing money in a hypothetical resource allocation task and to choose the compromise alternative in a hypothetical choice task of the sort employed by Briley et al. (2000) and described earlier. Furthermore, they were more likely to choose candies of different kinds (rather than of the same kind) as a gift for taking part in the experiment (thus minimizing the risk of regret in making an undesirable choice).

#### *Chronic mind-sets*

Although Briley and Wyer's findings provide evidence that a prevention mind-set can be situationally induced, chronic differences may exist as well. In fact, cultural differences in the disposition to focus on positive or negative decision consequences may be the result of socialization practices that emphasize these consequences (Miller, Fung, & Mintz, 1996; Miller, Wiley, Fung, & Liang, 1997). However, these differences are only evident when situational factors increase the accessibility in memory of cultural norms and values to which the decision strategies are relevant. Briley et al. (2000), for example, found that in the product choice task described earlier, East Asians were more likely than North Americans to choose the option that minimized the negative consequences of their decision but that this was true only if they were asked to give a reason for their choice. In later series of studies (Briley et al., 2005), bicultural Chinese participants were likely to choose this option if the experiment was conducted in Chinese but not if it was conducted in English. Thus, both sets of studies suggest that chronic cultural differences exist in the emphasis placed on positive or negative decision consequences but that the dispositions may not always be activated unless situational factors call attention to culture-related norms and values with which they are associated.

### *Uncertainty avoidance*

Briley and Wyer's (2002) studies suggest that activating a motive to avoid the risk of negative behavioral consequences induces a mind-set that generalizes over diverse choice situations. A closely related disposition may be the avoidance of uncertainty. Suppose individuals are confronted with a choice of receiving \$150 with either (a) 0.5 probability or (b) an unknown probability that could vary between 0 and 1. The expected likelihood of winning is the same in both cases. Nevertheless, individuals with a disposition to avoid uncertainty are inclined to prefer 'a' over 'b'.

Muthukrishnan, Wathieu, and Xu (2009) demonstrated the effects of both chronic and situationally induced differences in the disposition to avoid uncertainty. In two initial studies, individuals' chronic dispositions to avoid uncertainty were inferred from their responses to items of the sort noted in the previous paragraph. Then, in an unrelated product choice task, these individuals were asked their preference for either an established brand (e.g., Sony) with inferior attributes or a less established brand (e.g., Toshiba) with superior attributes. Participants with a chronic disposition to avoid uncertainty were more inclined to choose the established brand than other participants were. This was particularly true when the product was high tech and thus uncertainty was more acute.

In a third study, however, an uncertainty avoidance mind-set was situationally manipulated by exposing participants to a series of gambles in which either the payoff probabilities of both choice options were unambiguous or alternatively, one payoff probability was uncertain. In a product choice task similar to that used in other studies, only 49% of participants in the first condition opted for the established brand with inferior attributes. However, 64% of the participants in the second condition did so. Thus, both chronic and situationally induced dispositions to avoid uncertainty in one situation appear to generalize to other, unrelated situations that consumers encounter subsequently. Although the authors interpreted these findings in terms of the generalization of motivation over situation, an interpretation in terms of mind-sets is viable as well.

### *Affect-induced mind-sets*

The influence of affective reactions on both social and consumer judgments and behavior is widely recognized (Cohen, Pham, & Andrade, 2008; Schwarz & Clore, 1996, 2007; Wyer, Clore, & Isbell, 1999). Much of this influence is attributable to its use as information (Schwarz & Clore, 1983, 1996). However, affect can also have motivational influences. For example, people are typically motivated to eliminate the negative affect they happen to be experiencing (Andrade, 2005; Shen & Wyer, 2008a). More generally, Schwarz (1990) suggests that because positive affect is typically been associated with success and desirable behavioral outcomes, its occurrence in a situation induces an expectation that the situation is benevolent and requires little attention. Thus, it may activate a disposition to think globally and uncritically about the situation (e.g., an abstract-thinking mind-set, as described earlier in this

article). By the same token, negative affect is normally associated with unpleasant situations. Consequently, its occurrence induces a disposition to be vigilant and to process information carefully and systematically. Once these affect-related dispositions are activated, however, they may induce a mind-set that generalizes to other situations that are unrelated to the conditions that gave rise to them.

For example, positive affect may dispose individuals to process information in terms of broad categories whereas negative affect may dispose them to focus on detail. These dispositions could potentially have an effect at several stages of processing. At the comprehension stage, for example, happy individuals are more inclined than unhappy individuals to break social event information into broad conceptual units (Bless, 2001). In consumer judgment situations, the disposition to use broad categories can lead individuals to perceive brand extensions as more similar to the parent brand and consequently to judge the extension and parent as similar in quality (Barone, Miniard, & Romero, 2000; but see Yeung & Wyer, 2005, for a qualification on the generality of this finding). At the inference stage, happy individuals may be more inclined than unhappy participants to use categorical bases for judgment, as evidenced by their use of stereotypes in judging persons (Bodenhausen, 1993) and their use of brand name in evaluating commercial products (Adaval, 2003).

In summary, the aforementioned research suggests that the experience of positive and negative affect in one situation can activate a category-based and detail-based mind-set, respectively, and that once the mind-set is activated, it can influence processing in other situations to which it is potentially applicable. Moreover, these situations may be unrelated to the conditions that elicited the affect. The motivational influence of affect cannot be ignored, of course. (For extensive reviews of these effects, see Cohen, Phan, & Andrade, 2008; Andrade & Cohen, 2007.) For example, individuals who experience negative affect may be motivated to eliminate these feelings by deliberately engaging in activities that will distract them or make them happy (Andrade, 2005; Cohen et al., 2008; Shen & Wyer, 2008a). These conscious mood-repair strategies could override the effect of a mind-set. On the other hand, the results summarized earlier in this section suggest that the behavior motivated by mood repair concerns could sometimes create a mind-set that persists to influence behavior in later situations in which the motivation no longer exists. Whether this is so remains to be investigated.

### **Concluding remarks**

The effects of past behavior on future behavior and decisions cut across very diverse areas of research and theorizing and are evident at many stages of goal-directed cognitive processing. The research we have reviewed in this article testify to this diversity. At the same time, our conceptualization of behavioral mind-sets allows these effects and the processes that underlie them to be integrated within a common theoretical framework.

Our conceptualization has some limitations. At least three types of effects of past behavior do not fall within the framework

we have proposed. One, already noted, concerns the impact of past actions on the activation of a cognitive or motor production, which elicits behavior that is performed automatically with little if any cognitive effort and often without awareness. These effects, which been identified in consumer research (Shen & Wyer, 2008b) as well as other areas of psychology (Bargh, Chaiken, Raymond, & Hymes, 1996), are governed by different processes than those described in this article.

Second, the effects of a mind-set should be distinguished from attitude-mediated influences of past behavior. The foot-in-the door effect (Freedman & Fraser, 1966; for a review, see Burger, 1999) provides an example of this influence. In one study (Freedman & Fraser, 1966), California residents who had previously been asked to sign a petition to “keep California beautiful” were later more willing than control participants to have a very large and poorly lettered sign concerning safe driving placed in their front yard. One explanation of this effect is provided by self-perception theory (Bem, 1972). That is, individuals who recall their petition signing behavior may infer from this behavior that they are helpful persons and may base their later decision on this perception. This effect, however, may not reflect a mind-set. For one thing, the influence of a mind-set is normally of short duration, whereas the effects identified by Freedman and Fraser were evident even after a delay of 2 weeks. In addition, the effectiveness of the foot-in-the-door technique is influenced by factors that would not be predicted on the basis of a mind-set. For example, labeling the participants’ agreement with the initial request as helpful can increase the foot-in-the-door effect (Gorassini & Olson, 1995), whereas giving them extrinsic rewards for agreeing to the initial request can undermine it (DeJong & Funder, 1977).

Third, the effect of mind-set should be distinguished from the effect of general motivation. As noted earlier, Wadhwa et al. (2008) postulated that exposure to hedonically desirable (or undesirable) stimulus can have general motivational effects, increasing the evaluation of not only this stimulus but other, unrelated stimuli that are similar in hedonic valence. As Xu’s (2010) research indicates, the effect of past behavior on the activation of a mind-set can persist even after the motivation that gave rise to the behavior no longer exists. In many instances, however, generalized motivation could have an effect as well.

As these examples testify, our conceptualization is obviously not a complete formulation of goal-directed cognitive functioning. Furthermore, we have focused primarily on the deliberate identification and use of declarative knowledge in goal-directed activity. In some instances, however, the role of productions of the sort proposed by Anderson (1983) and described earlier cannot be discounted. The cognitive mechanisms we have outlined must ultimately be stated more precisely. As we have noted, several alternative formulations of memory retrieval and knowledge activation could potentially be applied to the phenomena we have discussed. Although a spreading activation conceptualization has typically been employed in describing social knowledge activation (Higgins, Bargh, & Lombardi, 1985; Wyer & Carlston, 1979), other metaphors may ultimately be more fruitful. (A version of the “resonance” formulation

proposed by Ratcliff, 1978; see also Wyer, 2004; Wyer & Radvansky, 1999, which does not require the specification of associative links between specific concepts and schemas, might be particularly useful.) Nonetheless, we hope that in its present form, the conceptualization provides a framework for integrating much of the current research on the impact of past behavior on future behavior and decisions and serves as a basis for future work in the area.

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