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An Episodic View of Motivation

Unconscious Influences of Memory

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OVERVIEW

The central theme of this chapter is that behavior is often guided by unconscious influences of memory for prior episodes. The presence of such unconscious influences places limits on conscious, intentional control of behavior. The term "unconscious" may evoke a comparison to the psychodynamic approach to motivation. Unlike psychodynamic theorists, however, we have not been concerned with unconscious influences that represent widespread effects of traumatic experiences or unresolved conflicts. Rather, we are interested in unconscious influences that originate from a myriad of mundane experiences. By "unconscious influences of memory," we refer to effects of prior experience on the performance of some task that arise even though a person does not consciously remember the relevant prior experience.

Other cognitive approaches to motivated behavior have been based on an underlying conception of cognition that stresses abstraction. Dynamic approaches to motivation also focus on factors that have wide-ranging effects, such as the arousal of needs that are expressed in a variety of situations. In contrast, our episodic view of motivation predicts that behavior is locally controlled by the specific configuration of a situation that elicits the retrieval of similar prior events. Unconscious influences of memory are much more context-bound than would be predicted by the psychoanalytic tradition or by many other current theories of social cognition.

The most dramatic examples of unconscious influences of memory are shown by amnesics. Amnesics show effects of prior experience on their performance of a variety of tasks, although, by definition, they are severely impaired in their ability to recognize or recall earlier experiences. Unconscious influences of memory in the domain of perceptual-motor skills occur in amnesics (e.g., Cohen & Squire, 1980; Corkin, 1968; Warrington & Weiskrantz, 1974). Amnesics also reveal effects of recent prior experience in their performance of verbal tasks. We

(Jacoby & Witherspoon, 1982) found that Korsakoff patients' interpretation of the meaning of a homophone (e.g., "read-reed") was influenced by memory for its recent prior presentation. Homophones were presented auditorily in the context of questions that biased interpretation toward the less frequent meaning of the homophone (e.g., "Name a musical instrument that employs a reed"). Subjects were later asked to spell several words; no mention was made that some of the words were homophones that had been presented in the earlier phase of the experiment. Amnesics showed evidence of memory for the prior presentation of homophones by spelling those homophones in line with the meaning biased by their prior presentation (e.g., "reed"). Effects on spelling were as large for amnesics as for normal subjects, although the amnesics were generally unaware that the homophones had earlier appeared in the questions. Indeed, many of the amnesics did not remember the question at all. Amnesics also acquire affective reactions, although they are less able than normal subjects to consciously recollect the prior experience that gave rise to those reactions (Johnson, Kim, & Risse, 1985).

Unconscious influences of memory can be found in the behavior of normal subjects as well as that of amnesics. Evidence of memory is often shown by performance on an indirect test, although a direct test reveals no evidence of memory (see Johnson & Hasher, 1987, and Richardson-Klavehn & Bjork, 1988, for reviews). Spelling, as used in our experiment with amnesics, is an indirect test of memory because the instructions refer only to the task at hand and do not refer back to a particular prior event, although the subject's performance on the task may be influenced by memory for that prior event. Recognition and recall are direct tests of memory because the instructions refer to a target event in the personal history of the subject and ask the subject to consciously recollect that earlier event.

We consider it likely that the unconscious influences of prior episodes that we find so prevalent in perception, problem solving, and judgment also play an important role in motivated behavior. What an episodic view means for predicting the effects of motivational variables and other social factors is that effects are more controlled by local circumstances than would be expected if an abstract representation of knowledge, such as a schema, were responsible for directing behavior. An advantage of using the term "episodic" to name the view is that it makes obvious the relevance of factors that influence episodic memory. As is true for episodic memory, factors that affect encoding and those that affect retrieval should be important for motivation. In particular, factors influencing retrieval can be responsible for inconsistency in performance across situations, because retrieval factors determine the particular prior episodes that are retrieved from memory to guide later behavior.

Use of the term "episodic" carries the disadvantage that "episodic memory" usually refers to aware uses of the past, such as performance on a test of recognition memory or recall. Although we refer to influences of memory for a prior episode, we do not mean to imply that people are aware of memory for that prior episode or its effects on later performance. Later, we argue that the subjective experience of remembering relies on inference or attribution processes, and so a particular prior event can affect performance of an ongoing task independently of conscious recollection or the subjective experience of remembering.

To illustrate what we mean by an episodic view of motivation, we briefly describe the different functions with which motivation is credited, and the theories that have emphasized those functions. For each function of motivation, we argue that the interpretation of that function changes when one considers the role of unconscious influences of prior episodes.

FUNCTIONS OF MOTIVATION

Motivation as Plans

One approach to motivation holds that behavior is intentional, directed toward the attainment of consciously held goals. According to this account, the major function of motivation is to guide the selection and performance of actions. Miller, Galanter, and Pribram (1960) presented the paradigmatic theory of goaldirected behavior in their notion of "TOTE" sequences. A person first tests (T) the difference between the environment and a goal; operates (O) on the environment to reduce the discrepancy; tests (T) again to determine whether there is still a discrepancy between the environment and the goal; and then exits (E) if the goal has been met. A number of cognitive theories of motivation (e.g., Cantor, Markus, Niedenthal, & Nurius, 1986; Schank & Abelson, 1977; Srull & Wyer, 1986) also focus on the goal-directed control of behavior.

Although Miller et al. (1960) put in a disclaimer that goals need not be held consciously, their examples clearly refer to conscious goals and plans. Certainly cybernetic models illustrate how biological and computational systems can be goal-directed without reference to consciousness. However, psychological models of intentional control implicate consciousness, often by linking consciousness and attention (Posner & Snyder, 1975; Shiffrin & Schneider, 1977) or consciousness and an executive function (Johnson-Laird, 1983; Shallice, 1972).

Kuhl (1986) outlines a theory of how intentions control action. People formulate particular intentions when a situation matches the contextual aspects of the propositional representation of that action. If the difficulty of carrying out an action is high, and yet an actor perceives himself or herself as capable of the action, then the actor will use self-regulatory strategies to help maintain the intention against competing action tendencies. These self-regulatory strategies include selective attention to goal-relevant information and active avoidance of distraction (Mischel, Ebbesen, & Zeiss, 1972). One can also attempt to selfregulate by actively restructuring the environment, as when one makes a social commitment to stop smoking so as to create social pressure in support of the intention (Thoresen & Mahoney, 1974).

However, not all behavior is consciously directed toward goals. We do not always plan and then act. We sometimes act and then, if necessary, make our

excuses. The theme of a great deal of recent research is that people are unable to report the factors that were important for controlling their behavior (e.g., Nisbett & Wilson, 1977). Behavior is often subject to unconscious influences that people either fail to notice or fail to comprehend (Bowers, 1984). One powerful source of unconscious influences is memory for prior episodes. When the current situation is very similar to a past situation, it effectively functions as a retrieval cue for the past situation. However, retrieval of the past situation need not be experienced as conscious remembering. Instead, the prior experience can unconsciously guide responses to the current situation.

Our suggestion that behavior is controlled by unconscious influences of the past may remind the reader of standard theories of automaticity, whereby unconscious behavior develops only after extended practice (e.g., Schneider & Shiffrin, 1977). The difference between that view of automaticity and our episodic view is in the specificity of the effects one would expect. An episodic view holds that performance is mediated by unconscious retrieval of memory for *particular* prior episodes. Thus, behavior will be sensitive to situational control because changing details of a situation create different cues for retrieval. The situation-as-retrievalcue determines the particular prior episodes that are brought forward to influence interpretation and behavior in a current situation. If memory for a relevant prior episode is easily accessible, then the choice and enactment of a response may appear automatic. People's experience is that a particular response comes immediately to mind when they encounter a situation. Thus, automaticity reflects the match between the current situation and memory for a prior episode, rather than an abstract representation that is used in an invariant way across situations. Logan (1988) presents a theory that automaticity is the use of memory for particular prior responses rather than the formation of an abstract procedure.

Actions controlled unconsciously by memory for prior episodes produce far more situationally specific behaviors than would be predicted by abstract conceptions of automaticity. Furthermore, the episodic control of behavior implicates memory variables such as encoding specificity, distinctiveness, and delay. We think that these sorts of factors may be responsible for the inconsistencies in social research on automaticity reviewed by Bargh (1989). To know what prior episode will be unconsciously retrieved in a particular situation, one needs to know how past experiences were coded, and thus what aspects must be reinstated in the current situation before a past experience will be retrieved.

Behavior is subject to multiple levels of control (see, e.g., Shallice, 1988; Wegner & Vallacher, 1986). When behavior is affected by the unconscious retrieval of prior episodes, control can be considered local. The situation structures behavior by determining which past experiences will be retrieved. In contrast, when behavior is controlled by conscious intentions, control is more global or external to the situation. How might these two sources of control interact?

We propose that an important function of conscious control is the inhibition of responses that would otherwise occur as the result of unconscious influences of the past. The unconscious use of past episodes may determine one's first reaction to a situation. Consciousness serves to "edit" those first reactions by anticipating

Chapter 13. An Episodic View of Motivation 455

consequences and generating alternatives. Another important function of consciousness is to produce greater consistency across situations. If left to unconscious influences, behavior would vary with the details of situations. Consciousness counteracts that variation by introducing a more abstract standard against which behavior can be judged. For example, one may consciously reject some action because it is inconsistent with a higher-level goal. In line with this argument, manipulations that increase self-awareness can increase the degree to which behavior is consistent with a person's self-image (e.g., Buss, 1980). It should be noted here that unconscious memory for prior episodes works in a way opposite to that usually credited to automatic, unconscious influences. We hold memory for prior episodes responsible for variation in behavior across situations, whereas an automatic response that relies on some abstract representation would produce consistency across situations. In theories such as Shiffrin and Schneider's (1977), conscious intervention is responsible for variations in performance. In an episodic view, consciousness serves the equally important function of imposing consistency on behavior across situations.

An observer often cannot tell whether behavior is guided intentionally or unintentionally by unconscious use of prior experiences. Both levels of control could produce behavior that appears orderly and well structured. Furthermore, one cannot use an actor's retrospective report that a particular action was intentional, because intention can be an attribution that follows rather than causes behavior (Gazzaniga, 1988; Nisbett & Wilson, 1977). When a conscious intention produces effects in the same direction as those produced by the unconscious retrieval of prior episodes, it is impossible to know which is controlling behavior. This problem of separating unconscious from conscious influences is a general one (Holender, 1986; Richardson-Klavehn & Bjork, 1988). In a later section, we describe a method that we have found useful for separating conscious and unconscious influences of memory and perception.

Motivation as Category Accessibility

The central tenet of the "New Look" movement in perception (e.g., Bruner, 1957) was that perception is strongly influenced by psychological processes related to expectancies, values, attitudes, and needs. According to Bruner, perception involves an act of categorization. The accessibility of categories, and thereby perception, are influenced by a person's needs and other motivational factors. When a person is confronted with a social situation that requires some action, categorization of the situation may be seen as a prerequisite for responding. The approach taken by Bruner and most other cognitive psychologists is to propose that categorization involves centralized, abstracted models of everyday knowledge. It is common to claim that a situation is first analyzed for cues that can be used to classify it as a member of a more general class, and is then responded to in terms of that more general category of situations. For example, a situation may be classified and responded to in terms of some schema that has been abstracted across experiences in situations that are similar to a present one (e.g., Hastie, 1981). However, being

confronted with a situation can also be seen as providing retrieval cues for memory of particular prior episodes involving situations that are *very* similar to a current one. The difference between the schema and the episodic view is in the level of abstraction of the memory representation that is said to guide behavior.

The notion of differences in category accessibility advanced by Bruner has been very popular in social psychology. Individual differences have been explained in terms of chronic differences in category accessibility. For example, researchers have suggested that particular trait and attitude categories are more readily accessible for people who are chronically disposed toward processing information with reference to those categories (e.g., Bargh & Pietromonaco, 1982; Fazio, 1986). Recent prior experience using a category is said to "prime" that category temporarily, making it temporarily more accessible for future use. In a wellknown investigation of priming effects in the social domain, Higgins, Rholes, and Jones (1977) showed that presenting subjects with positive- or negative-trait terms influenced the evaluative impression that subjects formed of an ambiguously described person. Similar effects have been reported by others (e.g., Bargh & Pietromonaco, 1982; Srull & Wyer, 1980). The priming of different styles of thinking is also said to be possible. LaRue and Olejnik (1980) primed either concrete or formal operational thinking and showed effects on a test of subjects' level of moral development.

The term "priming" is taken from theories of word perception, and so it is important to consider the assumptions carried by the term. Morton (1969) proposed a "logogen" model of word recognition to account for effects of frequency in the language and effects of recently seeing a word on later identification of that word. A "logogen" is an abstract representation that has been formed across repeated exposures to a word and that does not preserve any information about particular encounters. Words that occur frequently in the language (e.g., "cat") are identified more readily than are words that occur infrequently (e.g., "cot") and tend to be mistakenly reported when a low-frequency word is actually presented. These effects of frequency in the language are explained by the proposal that high-frequency words have a lower threshold, and so require less information for their identification than do low-frequency words. The form of the argument is the same as that made for chronic differences in category accessibility. Reading a word in the experimental setting makes that word easier to identify when it is later repeated. This effect is called "priming" and is explained by claiming that reading a word temporarily lowers the threshold of its corresponding logogen. It is important that the effects of priming be considered temporary. If priming were long-term, all logogens eventually would be primed, so the basis for explaining the difference in the identification of high- and low-frequency words would be lost. Similarly, if priming of social categories is considered to be long-term, chronic differences in category accessibility cannot be explained in terms of differences in thresholds. The use of the term "priming" in theories of social cognition is generally consistent with its use in theories of word perception (see Broadbent, 1977). Differences in category accessibility are explained in a way equivalent to claiming that logogens vary in their thresholds.

Chapter 13. An Episodic View of Motivation 457

According to an episodic view, it is (often unconscious) retrieval of memory for prior episodes, rather than differences produced by priming or chronic differences in the thresholds of abstract representations, that is responsible for the effects of prior experience on later perception and behavior. A priming view predicts that effects of prior experience will be relatively context-free because it is an abstract representation that is said to be primed. Later, we briefly review experiments that we have done to show effects of prior experience on perception that are too context-bound to be produced by the priming of an abstract representation.

Smith (1990) provides a review of effects on social judgments that are too specific to result from the use of schemas or other abstract representations. The framework that Smith proposes to interpret those effects is, in some ways, similar to our episodic view. Elsewhere, we (Jacoby, Marriott, & Collins, 1990) comment on similarities and differences between the two views. One difference is that Smith draws a distinction between content specificity and procedural or processing specificity. In contrast, we see memory as being for material as processed, so a distinction between content and processing of the sort implied by a proceduraldeclarative distinction is not useful (cf. Kolers & Smythe, 1979). Unlike Smith, we rely heavily on theorizing about episodic memory and use manipulations taken from experiments on episodic memory to explore effects on perception and judgment. We explain the variability in performance across situations in terms of differences in the encoding and the retrieval of memory for prior episodes.

The episodic view emphasizes the importance of the details of particular prior situations and experiences. In an episodic view, knowledge and motivation are decentralized, being spread across memory for prior episodes rather than being carried by a set of rules or general categories. The use of memory for episodes to direct the interpretation of later events and behavior is similar to that of the use of legal precedent in court cases. A current decision is made or a conflict is resolved by invoking the precedent of some earlier very similar situation. In this vein, our argument for the importance of memory for prior episodes is similar to arguments that case-based reasoning is often necessary because of the insufficiency of rules or other more abstract knowledge (e.g., Kolodner, 1984; Schank, 1982). Our emphasis on the importance of memory for prior episodes is also generally consistent with the discussions of exemplar or instances accounts of concept learning advanced by Brooks (1978), Medin (Medin & Schaffer, 1978; reviewed in Medin & Smith, 1984) and Hintzman (1986). McClelland and Rumelhart's (1981) discussion of the word superiority effect and Kahneman and Miller's (1986) discussion of judgment tasks also emphasize the importance of generalizing around prior instances.

The argument for the importance of memory for prior episodes is *not* an argument that only "surface" or literal characteristics of events are important. Rather, it is memory for the prior episode or event *as interpreted* that guides the interpretation of later events and behavior. Memory for prior processing episodes can preserve some overall interpretation of the earlier situation, as well as the organization of the perceptual stimulus and "semantic" aspects of the situation.

The motivation that was present during an earlier episode is likely to be important for memory of the episode. Again, the example of legal precedent is useful. Legal precedent rests on the overall similarity between a current case and some earlier case. Inferences about traits of the defendant and other sources of motives, as well as evidence used as a basis for those inferences, are likely to be preserved and enter into decisions about precedent. Unlike legal precedent, the use of memory for prior episodes does not necessarily involve conscious comparison of a present situation with some record of past situations. Memory for a prior event can produce unconscious influences on the perception and the interpretation of later events. That is, although a person does not recall or recognize an event as previously experienced, memory for that event can influence later judgments.

For a priming view to work, a category must retain its meaning and be used in an invariant fashion across situations. It might be tempting to solve the problem of specificity of effects by proposing subcategories or subtypes (e.g., Brewer, Dull, & Lui, 1981) that can be primed. However, at the extreme, subcategories would correspond to memory for particular episodes. Also, if subcategories are proposed, factors determining the level of categories that subjects use must be specified. According to our episodic view, use of particular prior episodes to interpret and guide behavior in a current situation depends on encoding-retrieval interactions of the sort that have been revealed by investigations of memory.

Consistency across situations must also be explained. For example, individual differences in achievement motivation have been used successfully to predict behavior in a wide variety of situations (e.g., Sorrentino & Short, 1986). Also, as described earlier, there do seem to be chronic differences in category accessibility. Abstractionist views are very well suited to explain stability in performance across situations, along with very general effects of a prior experience. How does an episodic view account for consistency in behavior across situations? Consistency can arise from generalization around memory for prior episodes (cf. Brooks, 1987; Hintzman, 1986; Medin & Schaffer, 1978). A person who is classified as being success-oriented, as compared to failure-threatened, has probably behaved frequently in a success-oriented manner in a wide variety of situations. This means that for the success-oriented person, a new situation is more likely to be similar to an old situation in which the person's behavior was success-oriented. Memory for that similar prior episode can be used to produce success-oriented behavior in the new situation; that is, behavior is directed by memory for prior episodes, rather than by some general trait that is then translated into behavior. How did the success-oriented person originally come to behave in a successoriented way in a variety of situations? As described earlier with reference to the executive function of consciousness, behavior may have originally been consciously controlled by the person or even directed by others. Once success-oriented behavior has been started by whatever means, an episodic view holds that memory for prior episodes of such behavior breeds more of such behavior. Akin to Logan's (1988) account of automaticity, effects of prior experience can be carried by memory for prior episodes, rather than by an influence on the status of some abstract representation or trait.

The notion of priming seems particularly poorly suited to describe differences in styles of thinking (cf. LaRue & Olejnik, 1980). Abstractions such as concrete versus formal operations seem more likely to be drawn upon by the theoretician to describe behavior than to be unitary memory representations in the head of the subject that guide behavior and that can be primed. That is, it seems unlikely that there is a "logogen-like" representation of formal operational thinking that can be primed and that is invariably applied across situations. In this vein, concrete versus formal operations in thought seem to be context-bound (Gelman, 1978). One's strategy or plans for dealing with a problem may often rely on prior experience with similar problems in similar situations—memory for prior episodes.

Effects on category accessibility can be explained by other theories as well as by an episodic view. We have earlier mentioned Smith's (1990) approach and noted its similarity to an episodic view. Also, Higgins (1989) has proposed a model that includes episodic, procedural, and general declarative knowledge to explain category accessibility effects. The commentaries accompanying Smith's (1990) book chapter describe other models and provide very useful discussions of concerns for choosing among models. The various models may be formally indistinguishable (Barsalou, 1990), so that the choice must be made on the grounds of parsimony and heuristic value. We believe that the major advantage offered by an episodic view is its heuristic value. The use of research and theories about episodic memory to guide research leads one to ask questions and to seek contrasts that would probably be ignored if one held an abstractionist view of cognition. Later, we briefly describe a few lines of research that have grown out of our episodic view of cognition.

The Energizing Function of Motivation

Motivation has been credited with providing the energy or the "push" for behavior and is often treated as separate from other factors that control behavior. For example, drive has been said to combine with habit to determine performance. We argue that the source of energy for a behavior is often not separate from the control of behavior by prior experience. Once again, the question concerns the level of abstraction of the memory representation that controls behavior. Habit is an abstractionist notion, in that habit is said to cumulate across experiences. Claims that experiences are pooled to determine the "strength" of an association rest on many of the same assumptions as do claims for the existence of an abstract representation of a category. In contrast, an episodic view holds that memory for the particular experiences are retained and serve as a source of control for future behavior. An episodic view emphasizes the possibility of motivational variables configuring with other details of a situation. We first illustrate the importance of this possibility for the separability of habit and drive, and then argue that the same concerns apply to expectancy-value theories of motivation.

For drive to be treated as separate from habit, the one has to remain constant across variations in the other. A given number of hours of food deprivation, for

example, must give rise to the same amount of hunger across a wide range of situations. Also, for any given situation, the stimuli to which a response is attached must remain constant across different levels of hunger. The simplest theory of this sort would hold that drive plays no role in defining either the stimulus to which a response is attached or the strength of the association formed between the stimulus and response. Drive would be said to influence only performance, not learning. The proposal (Spence, 1956) of a multiplicative relation between drive and habit as determinants of responding conveys this learningperformance distinction. A multiplicative relation between habit and drive means that when drive is at zero a response will not be observed, regardless of the strength of the association between a present stimulus and that response.

However, eating depends not only on number of hours of food deprivation, but also on factors such as the particular foods available, the time of day, and the social facilitation produced by others' eating. The effect of number of hours of food deprivation is likely to configure with those other factors. For example, the stimulus characteristics of a pizza might differ if one has not eaten for several hours and is surrounded by others who are rapidly devouring the pizza, as compared with a situation in which one has recently eaten another pizza and is not required to compete for the present one. There is good evidence to show the presence of interactions in palatability (e.g., Grill & Berridge, 1985). If configurations involving the effects of food deprivation dominate, it is no longer useful to talk about hunger separately from the other details of the situation. Indeed, the experience of hunger probably results from an interpretation of the whole situation, rather than from number of hours of food deprivation alone (e.g., Schachter, 1971). If so, only predictions that are very specific to the details of the situation can be made, because of the variability in performance produced by changes in configurations across situations. However, varying food deprivation surely produces some consistency across situations. One way of describing that consistency is in terms of similarity among configurations or situations. The claim would then be that an animal learns what to do in particular situations, and that hours of food deprivation configure with other stimulus properties to define those situations.

An episodic view of motivation is well equipped to describe configural relations between drive and other stimulus aspects of a situation, because an episodic view describes effects on behavior as depending on the similarity of the present situation to memory for prior episodes. We have illustrated arguments about drive by using the example of food deprivation. However, the same arguments apply to theorizing about dynamic processes and other sources of motivation that are typically investigated by social psychologists, and to descriptions of energizing functions of motivation that sound different from the classic notion of drive. For example, Bruner (1957) suggested that needs, task goals, and so on influence category accessibility by producing certain kinds of search sets. Rather than changing search sets, manipulations of motivation can be seen as influencing the cues that are available for unconscious retrieval of memory for prior episodes. We say "unconscious retrieval" because, as we discuss later, the retrieved memo-

460

ries influence subjective experience of the present instead of being experienced as memories. Manipulations of motivation may often have effects that configure with other factors to influence perception of a situation as a whole, rather than effects that are invariant across situations.

The possibility of configurations also creates problems for expectancy-value theories of motivation. According to those theories, choice is determined by the probability of obtaining a given outcome multiplied by the value of that outcome. The difficulties come when one describes how the probability of an outcome is estimated. Those probabilities are typically given to subjects in experiments, but would often have to be estimated outside the laboratory. People could estimate probabilities based on abstract representations that record the frequency of different classes of events-a notion similar to that of habit strength. Models of this form were called into question by Tversky and Kahneman's (1973) demonstrations that people use an "availability heuristic" to estimate probabilities. This means that people estimate the probability of an outcome as high if they can easily think of a prior occurrence of that outcome. Memory for particular experiences, rather than an abstract representation, serves as a basis for estimating probabilities. Expectancy and value are then no longer separate. The value of an outcome would configure with other details of a situation to determine which prior episodes would be retrieved, and consequently would influence the estimated probability of the outcome. Even when the probabilities of an outcome are given along with the outcome, the one is likely to influence interpretation of the other. Kuhl (1986) criticizes expectancy-value theories of motivation by noting that choice behavior is highly context-specific. Context specificity is to be expected if behavior relies on memory for prior episodes.

Motivation as Orientation

Another approach to motivation focuses on people's general orientation or mode of operation, as in Wicklund's (1986) distinction between "dynamic" and "static" orientations and Kuhl's (1986) conception of "action" versus "state" orientation. In particular, Wicklund proposes that one has a dynamic orientation to the environment when there is a press from the environment toward certain behaviors and one can enter into a "good fit" with those environmental demands. For example, a highly skilled engineer may have a "flow" experience when given the task of designing a bridge, because he or she has the skill to accomplish the task and can proceed immediately to solving the problem. In contrast, much less skilled engineers given the same task may have a poor fit with the environment and their performance may quickly derail, leading them to shift to a static mode in which they reflectively consider what sort of person could succeed in the task. Kuhl (1986) uses the difference between action and state orientation as an individual-difference dimension.

Orientation can lead to qualitative differences in the processing of information. We have found Polanyi's (1958) distinction between "tool" and "object" useful for thinking about the consequences of orientation or set for memory.

Polanyi has illustrated his distinction in an anecdote about reading his morning correspondence. He is multilingual and reports that it is necessary for him to look back at the language in which a letter is written before passing it to his son, who reads only English. When he is reading the letter, the language serves as a tool to convey meaning. When used as a tool, the language is transparent, used without awareness of the particular words being read. To specify the language, he has to make language the object of attention. Polanyi has also applied his distinction between tool and object to describe skilled performance. When one is driving a car, one's focus is on the road, rather than on the specifics of driving such as shifting gears. When accomplished drivers attempt to describe the particulars of driving to a beginner, they often are unable to do so. Also, treating the skill as an object for description can destroy skilled performance.

Polanyi's distinction between tool and object can be applied to two functions of memory (Jacoby & Kelley, 1987; Jacoby, Kelley, & Dywan, 1989). In conscious recollection, memory is treated as an object that can be inspected and described to others. Direct tests of memory, such as recognition and recall, request that people treat memory as an object by focusing on the past. Memory can also be used as a tool in a present task. When memory is used as a tool, people's attention is focused on the present rather than on the past, and memory for prior episodes is unconsciously incorporated into the ongoing task, altering perception, interpretation, and performance. The description of memory used as a tool is similar to Bransford, McCarrel, Franks, and Nitsch's (1977) notion that memory sets the stage for perception and interpretation of later events. The notion of memory as an object is similar to Johnson's (1983) description of "reflection."

One implication of the tool versus object metaphor is that treating memory as an object for recall or recognition, as compared with using memory as a tool, requires a different focus of attention and different types of processing. The two uses of memory can be antagonistic because of this difference in focus of attention. Later, we report data showing that the use of memory as a tool produces unconscious influences of the past. People can use memory for a specific prior episode as a tool in the perception and interpretation of events, although they are unable to recall or recognize the relevant prior episode. The use of memory as a tool can unconsciously affect subjective experience. As we discuss later, unconscious influences of this sort are important because people often use their subjective experience as a basis for judgment.

Unconscious influences of memory can arise simply because one is oriented toward the present rather than the past. Although people may shift orientations and focus on consciously remembering, they also may simply unconsciously use past experiences as a tool in their interpretation of the present. As an example, consider the effect of seeing an automobile accident while driving. Tversky and Kahneman (1973) note that people typically drive very carefully immediately after viewing an accident. They propose that the accident is readily available in memory for some time, and so increases people's estimates of the probability of an automobile accident by means of an availability heuristic. Tversky and Kahneman's (1973) use of the driving example implies that the careful driving results from people's conscious reflections upon their memory of the accident in order to arrive at an estimate of the probability of an accident. However, the effect seems better described as treating memory as a tool rather than as an object. Memory for a recently viewed accident seems to make people see danger in a current situation that would otherwise not seem dangerous. The focus is on the present, not the past. Indeed, focusing on the past—reflecting on one's memory for the automobile accident—may even be antagonistic to its effects on interpretation of the present. The use of memory as a tool may produce unconscious influences that are somewhat analogous to those described as "projection" in the psychoanalytic tradition.

One can also consider motives in light of the tool versus object metaphor. Experiments designed to manipulate attitudes and to induce cognitive dissonance often produce changes in performance that supposedly are mediated by attitudes or dissonance without corresponding changes in self-reports (e.g., Nisbett & Wilson, 1977; but see Quattrone, 1985). Similarly, individual differences in motives such as need for achievement or uncertainty orientation produce differences in behavior without accompanying differences in subjects' reports of their motives (R. M. Sorrentino, personal communication, May 1989). Self-report requires one to treat one's motives or attitudes as objects for reflection and observation, whereas performance measures allow one to use motives as tools in the production of behavior.

From an episodic perspective, people with a high need for achievement have repeatedly acted in ways that have furthered their power over people or things. Memory for those prior episodes may be used unconsciously as a tool in the perception and interpretation of Thematic Apperception Test (TAT) cards, as well as in the production of responses to situations that are similar to the prior episodes. However, people may later be unable to report their motives for an action, because a motive was not part of their conscious experience or a prerequisite for their behavior in the situation. To the extent that behavior is controlled unconsciously by memory for prior episodes, motives, intentions, trait terms, or higher-level descriptions of behavior play no role in controlling behavior and do not enter into one's subjective experience of a current episode. Wicklund (1986) makes a similar point that the dynamic (motivation-as-tool) and static (motivation-as-object) orientations are incompatible. Only people who cannot enter into a dynamic relation with their environment will attempt to formulate behavior in that environment in general trait terms, whereas people who are competent allow the environment to dynamically guide their actions (Wicklund & Braun, 1987). Those who can, do; those who can't, talk about abstractions.

Elsewhere, we discuss the difficulty of separating behavior that is controlled by consciously held intentions from behavior that is controlled by unconsciously used memory for prior episodes (Kelley & Jacoby, in press). Self-report cannot be relied upon as an indicator of conscious control, because intentions (and, we suspect, conscious motives) are attributions that can follow rather than cause behavior. Methods such as placing conscious intentions in opposition to unconscious influences allow one to separate the two.

EMPIRICAL ISSUES

There is a danger associated with being very speculative and providing interesting examples, as we have attempted to do up to this point in the chapter. The danger is that the reader may come to expect one's experiments to be as interesting as one's examples. Unfortunately, some of the experiments that we describe here are related only indirectly to questions about motivation, and none of the experiments used materials that are particularly relevant to social settings. However, many of the issues for the effects of motivation on social cognition are the same as issues in other areas of cognitive psychology. For example, some of the experiments we describe investigated the effects of recent prior experience on word perception. Those experiments show that effects on perception can rely on memory for a prior episode, rather than on the priming of an abstract representation such as a logogen. The results relate to the notion of priming as used by investigators of social cognition. Effects of memory for a prior episode should be more difficult to obtain in word perception than in person perception. The large amount of experience that undergraduates have in reading should favor the development of abstract representations that are used for word identification. Consequently, the finding of effects of memory for prior episodes on word identification is impressive and encourages looking for similar effects on social cognition.

In the first part of this section, we describe experiments that revealed unconscious influences of memory on perception. Next, we present experiments to show that awareness often serves the function of opposing unconscious influences that, if left unopposed, would arise from using memory for a prior episode as a tool. We then describe effects on subjective experience that are produced by using memory as a tool. We argue that subjective experience serves as one basis for judgments. The problem of explaining effects on subjective experience is similar to that of explaining causal attributions in social settings. Noting this similarity leads to a discussion of memory attributions.

The description of our research is brief, because much of it has recently been reviewed elsewhere (e.g., Jacoby, 1988; Jacoby & Kelley, 1987; Jacoby, Kelley, & Dywan, 1989, Kelley & Jacoby, in press). The main thing that we hope a social psychologist can take away from reading about our research is a set of questions and procedures that can be translated into research on social cognition. We have attempted to develop procedures that can be used to isolate effects of different sorts. For example, we argue that both aware and unaware effects of motivational variables and other factors can be observed. The trick is to separate those effects.

Many of the effects on perceptual identification performance that we describe have also been obtained using other indirect tests of memory, such as tests requiring completion of picture or word fragments and lexical-decision tests. Research done by Roediger and his colleagues (e.g., Blaxton, 1989; Roediger & Blaxton, 1987) is particularly relevant to some of the issues discussed here and leads to conclusions that are consistent with the ones we draw. Richardson-Klavehn and Bjork (1988) provide a more complete review of the literature comparing performance on indirect and direct tests of memory.

464

Unconscious Influences on Perception Produced by Memory for Prior Episodes

We have used effects of prior experience on perceptual identification of words as an indirect test of memory. Like the amnesic subjects, who heard words in the study reported earlier (Jacoby & Witherspoon, 1982), normal subjects show effects of earlier reading a word on its later perceptual identification, although they are unable to consciously recollect having earlier read the word. We briefly describe a few experiments to illustrate those effects and to show that they arise from unconscious influences of memory for prior episodes, rather than from the priming of some abstract representation.

Typically, in our experiments (e.g., Jacoby & Dallas, 1981), subjects were given a long list of words to read and were then given two types of tests. One test was a test of list recognition, for which previously read words were mixed with new words. In this direct test of memory, subjects were to indicate whether or not they recognized each word as read in the earlier list. The second type of test was a perceptual identification test that served as an indirect test of memory. Old and new words were mixed, and each word was flashed for a very brief duration (e.g., 35 milliseconds), followed by a visual mask. Subjects were to identify the flashed words by saying them aloud, and the dependent variable was the probability of identification. An advantage for old words in perceptual identification provides evidence of an influence of memory for a prior presentation of a word on its later perception. However, it is not logically necessary for old words to be recognized as previously presented for those words to hold an advantage in perceptual identification performance. For the perceptual identification task, our subjects were only asked to report the word that was presented, without reference to whether it was an old or a new word.

In these experiments, previously reading a word had a large effect on its later identification, sometimes doubling the probability that the word would be identified when flashed. This effect on identification performance was observed even when people were unable to recognize words as ones that were read in the earlierpresented list of words. Also, some manipulations that were important for list recognition performance were unimportant for effects on perceptual identification performance. Dealing with the meaning of a word rather than with more superficial characteristics, such as the appearance or the sound of a word, enhanced later list recognition performance (cf. Craik & Lockhart, 1972) but provided no advantage for perceptual identification performance (Jacoby & Dallas, 1981). Effects on perceptual identification performance were also specific to the modality of presentation of a word. Reading a word had a large effect, but hearing a word or producing a word as a name of a picture had little, if any, effect on later visual-perceptual identification of the word (e.g., Jacoby & Dallas, 1981; Morton, 1979). Effects on perceptual identification were long-lasting, persisting for at least 5 days (Jacoby, 1983a).

Effects of reading a word on its later identification are, in some ways, similar to the effects of priming on person perception (e.g., Higgins et al., 1977).

However, the effects on word perception are too long-lasting to be produced by the priming of some abstract representation. The same might be said for effects on person perception. Srull and Wyer (1979) observed that unscrambling sentences that had hostile content led subjects later to judge ambiguous descriptions of people as more hostile; the authors attributed that effect on person perception to the priming of the abstract trait of hostility. However, this effect on impression formation remained even when the test was delayed for 24 hours. In a later paper, Wyer and Srull (1986) have suggested that the priming effect is restricted to occasions when the trait is applicable and the subject has the goal of forming an impression. We would restrict the effects even further: In our view, effects on person perception as well as effects on word identification reflect memory for prior episodes, and consequently depend on factors influencing encoding and retrieval.

Again, arguments for effects of past experience on word identification also ought to apply to effects observed in social settings. Effects on identification of words presented without context reflect primarily memory for the earlier visual processing of an item. However, the claim that effects on person perception rely on memory for prior episodes does not imply that those effects rely on the literal or surface characteristics of earlier-presented items. Unconscious influences having to do with the earlier processing of the meaning of an event have also been observed (Jacoby, Kelley, & Dywan, 1989). The spelling task used in the earlierdescribed experiment employing amnesics as subjects (Jacoby & Witherspoon, 1982) serves as one example of an indirect test of memory that shows effects of the earlier processing of meaning. The finding that effects of prior experience are long-lasting is one piece of evidence against an account in terms of priming; along with other evidence, it can be used to support an episodic view of cognition (e.g., Jacoby & Brooks, 1984).

Effects of prior experience on perception are also too context-specific to be produced by the priming of an abstract representation. If effects on perceptual identification are produced by priming, those effects should be general, not restricted by memory for details of a prior presentation. However, manipulations of study processing influence later perceptual identification performance. We have found that prior presentation of an item does most to enhance its later perceptual identification when the processing of the item during its prior presentation matches that required by the test of perceptual identification (e.g., Jacoby, 1983b). Manipulations of retrieval factors also influence the effect of previously presenting an item on its later perceptual identification (Allen & Jacoby, in press; Jacoby, 1983a). Smith and Branscombe (1987, 1988) report investigations of person perception that, like our investigations of word perception, show effects of recent experience that are too specific to be interpreted as due to priming.

The results of our perceptual identification experiments can be summarized as showing that the effects of recent experience cannot be produced by priming an abstract representation, but must involve a memory that can be accessed when the details of the experimental setting are reinstated. Depending on the relation between study and test processing, memory for a prior episode can be uncon-

Chapter 13. An Episodic View of Motivation 467

sciously retrieved and used as a tool to aid perception of a later event. Effects of priming on person perception may also depend on reinstating the experimental context. If retrieval factors are important for social judgments, judgments will vary across situations as changes in cues for retrieval produce changes in the particular prior episodes that are retrieved and used as guides for interpretation of later events. Also, the overall similarity between earlier and later events should be important. Effects on word identification show that memory for a prior episode can be used as a tool even when people are unable to treat memory as an object for a test of recall or recognition memory. That is, the dissociations between effects on recognition and perceptual identification performance provide evidence that effects on perceptual identification arise from unconscious influences of memory. A person need not be able to recall or recognize an earlier event for memory of that earlier event to influence later performance. These unconscious influences of memory place an important limitation on claims that behavior is consciously goaldirected.

The Advantages of Opposition for Revealing Unconscious Influences

The possibility of unconscious influences has held fascination for laypeople as well as for experimental psychologists, but the two groups have very different interests. For the layperson, the possibility of unconscious influences is fascinating because of its implication that one is open to influences that are not detected and consequently cannot be opposed. The possibility of unconscious influences seems sinister, leaving one vulnerable to control via subliminal advertising or brainwashing. Experimental psychologists have been preoccupied with countering such sensationalistic claims about the dangers of unconscious influences. The history of research on unconscious influences has been marked by supposed demonstrations of unconscious influences, followed by further research to uncover methodological flaws in those supposed demonstrations. Experimental psychology has commonly framed the question of unconscious influences in terms of differences in the sensitivity of tests. Are there measures of perception or memory that are more sensitive than verbal report (e.g., Eriksen, 1960)? If the differential sensitivity cannot be demonstrated, then claims of unconscious processes are dismissed.

In what follows, we side with the layperson to a greater extent than with the experimental psychologists. We are not ready to accept sensationalistic claims about subliminal perception or unconscious influences of the past. However, we agree with the layperson that it is the detection of, along with the possibility of opposing, a potential source of influence that is important. We argue that an important function of consciousness is to oppose influences that would otherwise prevail. This opposition of conscious and of unconscious influences also provides a useful tool for their investigation.

Recently, there have been controversial demonstrations both of unconscious perception and of unconscious forms of memory. For example, Marcel (1983) studied unconscious perception by flashing words for a brief duration, followed by

a pattern mask. He claimed that priming words speeded lexical decisions regarding target words even when subjects were unaware of the primes. In the domain of memory, subjects can exhibit unconscious influences of the past when their performance is altered by experience, in the absence of conscious recollection of that experience. As described above, reading a list of words enhances later perceptual identification (e.g., Jacoby & Dallas, 1981) and fragment completion (e.g., Tulving, Schacter, & Stark, 1982) of those words, even when subjects do not consciously recognize the words as being from the earlier list.

These and other experimental demonstrations of unconscious perception and memory have been criticized on the grounds that the experimenter has mistakenly measured conscious rather than unconscious performance. Marcel's (1983) method of determining a threshold for unconscious perception was criticized as producing a stimulus duration so high that subjects were aware of the words. When the situation is such that aware and unaware perception produce effects that are in the same direction, results taken as evidence of unconscious perception may actually reflect aware perception that is undetected by the experimenter. Indeed, Holender (1986) argues that there is so far no convincing evidence for unconscious perception from either visual-masking paradigms or divided-attention paradigms. Similarly, in studies of memory, Richardson-Klavehn and Bjork (1988) note that many effects commonly ascribed to unconscious forms of memory may be contaminated by conscious recollection. For example, the enhanced fragment completion for old words relative to new ones may be accomplished by quite deliberate and conscious retrieval of studied words.

We (e.g., Jacoby, Woloshyn, & Kelley, 1989) have taken an alternative approach to the notion of differing thresholds or sensitivity of conscious and unconscious processes. We start by assuming that awareness serves an important function of opposing unconscious influences. A commonplace example of such a function is the problem of avoiding repeating oneself. One effect of telling a story is to later make that story come more readily to mind and be told repeatedly to the same audience. However, conscious recollection can be used to oppose this effect of the past. If we recognize that we have already told a story to someone, we can inhibit the tendency toward repetition. Similarly, conscious experience of an event can oppose unconscious influences of perception. In the apocryphal example of subliminal advertising in movies, the notion was that people could resist messages when they were aware of their source as advertisements. However, the effect of a subliminal message to "Drink Coke" was considered likely to be mistakenly attributed to one's own desire for a drink. More generally, behavior may often not originate from an intent or be goal-directed. Rather than serving as a prerequisite for effects of memory, awareness of the past may often serve to oppose effects that would otherwise arise.

We have adopted the strategy of placing conscious and unconscious processes in opposition so as to reveal unconscious influences. When the situation is such that aware and unaware perception or memory would produce effects that are in the same direction, effects that are taken as evidence of unconscious perception or memory may actually reflect aware processes (e.g., Holender, 1986). This possibil-

Chapter 13. An Episodic View of Motivation 469

ity is ruled out when awareness produces effects that are in the opposite direction from those produced by unaware processes. Opposition allows a clear separation of consicous from unconscious influences. The strategy of looking for opposite effects is a variant of the strategy of searching for qualitative differences in performance produced by conscious versus unconscious perception (e.g., Cheesman & Merikle, 1986; Dixon, 1981; Marcel, 1983) or by conscious versus unconscious influences of memory (e.g., Jacoby & Dallas, 1981). The approach of looking for opposite effects has considerable heuristic value, particularly if one accepts our starting assumption that awareness often does oppose unconscious influences.

Becoming Famous without Being Recognized

We have used the strategy of looking for opposite effects to show that unconscious influences of memory can make nonfamous names seem famous. In those experiments, people first read a list of names that they were correctly told included only nonfamous names. Next, these old nonfamous names were mixed with new nonfamous and new famous names and were presented for fame judgments. People were asked to judge whether or not each name was a famous one. Aware and unaware uses of memory were expected to have opposite effects on fame judgments, much as conscious and unconscious influences do in the example of repeatedly telling a story. Memory for earlier reading a nonfamous name should have the unconscious influence of making the name seem familiar, and thereby should increase the probability of the name's mistakenly being called famous. Aware use of memory to recognize a name as read in the earlier list of nonfamous names should oppose this unconscious influence of memory. If a name was recognized as read in the earlier-presented list of nonfamous names, people could call the name nonfamous with certainty. A finding that old nonfamous names were more likely to be called famous than were new nonfamous names would provide evidence of an unconscious influence of memory, because awareness of having read a name in the earlier-presented list would produce the opposite effect.

Using the fame judgment task, we (Jacoby, Kelley, Brown, & Jasechko, 1989) found an effect similar to the "sleeper effect" that has been investigated by social psychologists (Cook, Gruder, Hennigan, & Flay, 1979; Hovland, Lumsdaine, & Sheffield, 1949; Pratkanis, Greenwald, Leippe, & Baumgardner, 1988). The sleeper effect is the finding that a message from a low-reliability source has a larger impact on a delayed than on an immediate test of attitude change. The effect has been explained as resulting from faster forgetting of the source than of the message gained from that source. We found that old nonfamous names were less likely to be called famous than were new nonfamous names on a test of fame judgments that came immediately after reading a list of nonfamous names. On that immediate test, people could easily recognize old nonfamous names as ones read earlier, and consequently could be certain that those names were nonfamous. However, old nonfamous names were more likely to be called famous than were new nonfamous names when the fame judgment test was delayed; this was

similar to the sleeper effect found for attitude change. On the delayed test, old names remained familiar but the source of that familiarity was not consciously recollected, so the names were mistakenly called famous. Findings of a sleeper effect in attitude change have been controversial (e.g., Greenwald, Pratkanis, Leippe, & Baumgardner, 1986). The fame judgment task is potentially useful for specifying the combination of conditions that are necessary to produce a sleeper effect.

It has been claimed that the attention to an event that is necessary to produce later awareness of memory for the event differs from the attention that is necessary to produce unconscious influences. For example, memory for unattended events is said to be revealed in the form of dreams, although one is unable to recollect the event consciously (see Dixon, 1981, for a review). We (Jacoby, Woloshyn, & Kelley, 1989) have used the fame judgment task to show effects of this sort. Dividing attention by engaging in a listening task while reading a list of nonfamous names resulted in old nonfamous names' later being more likely to be mistakenly called famous than were new nonfamous names. The opposite was found when full attention was given to reading the list of nonfamous names. The results of further analyses showed that dividing attention reduced a person's ability to recognize a name as having been read earlier, but had no effect on gains in familiarity produced by that earlier reading of the name. Names can be called famous without being recognized either if attention is divided during the reading of names that one has been told are nonfamous, or if the delay between reading nonfamous names and the test of fame judgments is increased.

R. M. Sorrentino (personal communication, May 1989) has raised the possibility that unconscious influences can also lead to corrective action. To use his example, "I might think of a great dirty joke to tell, but my unconscious need for social approval brings to mind that I should not tell a dirty joke to a group of nuns." According to our view, one may first make the mistake of telling a dirty joke to a group of nuns or some other unappreciative audience. Later, in a similar situation with one's aged aunt, memory for that earlier episode may lead one to view the present audience as potentially unappreciative. Awareness of that possibility should oppose unconscious influences of other memories that push toward telling the joke. If one's attention is divided in the later situation, one may fail to consciously monitor performance, and consequently may tell the dirty joke to one's aunt. However, episodes in which one successfully opposes unconscious influences are represented as memory for prior episodes that also unconsciously influence later behavior. If one has inhibited the telling of dirty jokes on several occasions, memory for those prior episodes can have the unconscious influence of making one so virtuous that a dirty joke does not even come to mind in front of a group of nuns, saving one from telling the joke even if attention is divided. Memory for prior episodes can unconsciously influence what comes to mind, can unconsciously influence the interpretation of situations, and (if left unopposed) can control behavior. Consciousness can serve to oppose unconscious influences of memory. Our episodic view predicts that behavior should be less stable across

situations than would be predicted by a general unconscious need for social approval.

Spontaneous versus Directed Recollection

According to our tool-object distinction, the treatment of memory as an object requires a different focus of attention and different types of processing than does the use of memory as a tool. This means that conscious recollection of an earlier event requires an act that is separate from using memory for the prior event as a tool in some ongoing task. If conscious recollection does require an attention-demanding, separate act, it should be possible to limit the opportunity for conscious recollection by dividing attention at the time of testing. In line with that possibility, we (Jacoby, Woloshyn, & Kelley, 1989) have shown that requiring people to divide attention by engaging in a listening task while making fame judgments results in old nonfamous names' being more likely to be called famous than are new nonfamous names. Dividing attention limits the opportunity for conscious recollection of the source of familiarity of old nonfamous names, and consequently leaves unopposed the effects on familiarity produced by reading those names earlier.

If the unconscious use of a message and recollection of its source are separate acts, it is important to determine the conditions that encourage people to attempt recollection of source. The problem is the same as that of determining the conditions that lead to spontaneous causal attributions (e.g., Hastie, 1984; Weiner, 1985). The procedure in our fame judgment experiments differs in an important way from that of most other experiments done to investigate memory for source. Most other investigations of memory for source direct people to recall the source of a message (e.g., Johnson & Raye, 1981). This requirement to recall source may overestimate the probability of its being recollected if people had not been instructed to do so. In contrast, fame judgments provide a measure of spontaneous monitoring of source. When people are only asked to make fame judgments, they must take the initiative to recollect the source. A failure to check whether a name was among those read earlier is shown in old nonfamous names' being called famous. That is, effects on fame judgments can be used to infer whether or not spontaneous recollection of source has occurred.

Dividing attention at the time of testing makes spontaneous monitoring of source more difficult and thus less likely, as do factors such as divided attention during study and increases in delay. Spontaneous recollection of source is also less likely when there is a low probability that a message came from a misleading source. In our fame judgment task, people were more likely to mistakenly call old nonfamous names famous when very few, rather than many, of the names presented for fame judgments were old nonfamous names (Jacoby, Kelley, Brown, & Jasechko, 1989). Attempts to recollect source consciously may not be worth the expense when retrieval is difficult and the probability of a message's coming from a misleading source is low. People can sometimes recollect source when directed to do so, although they may not spontaneously recollect source. The probability of

calling an old nonfamous name famous is reduced when source recollection is directed by requiring people to judge whether or not each name is old (presented earlier in the list of nonfamous names), as well as to make fame judgments (Jacoby, Kelley, Brown, & Jasechko, 1989). It is likely that there are also large individual differences in the probability of spontaneous monitoring of source. Folklore has it that the aged are less likely than are younger people to spontaneously montior their performance. For example, a common complaint about the aged is that they repeatedly tell the same stories and more likely than are younger people to deal inappropriately with a message from a misleading source. We (Dywan & Jacoby, in press) have used the fame judgment task to show that the aged are less likely than younger people to monitor source spontaneously. In that experiment, the aged were more likely to mistakenly call old than new nonfamous names famous, whereas the opposite was true for younger people.

The factors that are important for spontaneous monitoring of source are also likely to be important for monitoring of other dimensions. Some theories of motivation emphasize the goal-directed nature of behavior and the control of behavior by comparison with some standard such as a self-concept (e.g., Cantor et al., 1986). However, the probability of spontaneous monitoring with reference to a self-concept may depend heavily on the details of the situation, as did spontaneous monitoring of source in our fame experiments. Awareness may often serve to oppose unconscious influences on behavior that would hinder attaining some goal. Placing aware and unaware effects in opposition is a strategy that should be generally useful for investigating effects on monitoring.

Memory Attributions

Historically, writings about the unconscious have emphasized that different laws govern unconscious and conscious processes. It was thought that unnoticed or unattended events can nonetheless be detected in free associations, fantasies, or dreams (e.g., Dixon, 1981; Ellenberger, 1970). It was further believed that conscious processes are more active, whereas unconscious influences are more likely to emerge when one is relaxed or distracted by some other task. Our distinction between memory-as-tool and memory-as-object partially captures these distinctions. When one is engaging in a particular task, memory can be used as a tool without any analysis or activity beyond performing the task itself. In contrast, treating memory as an object of conscious reflection generally requires more active, analytic processing. Using memory as a tool is a nonanalytic process that does not allow one control over what aspects of a memory are used. It is also nonanalytic in that one cannot identify the prior experiences that may be acting as a tool to accomplish the present task, or even which aspects are responsible for changes in performance. Therefore, using memory as a tool leaves one open to errors of interpretation regarding the source of influences on a task.

Awareness of the past is not an attribute of a memory representation. Instead, gaining awareness is an attention-demanding act. Conscious remembering as a separate act is analogous to the difference between looking at someone in a crowd and noticing that person. In both cases, one obviously is using the "representation" of the person. But it makes more sense to talk about the change in attention or analysis involved in noticing than to make noticing a characteristic of the thing noticed. Similarly, conscious remembering is better understood as a process rather than a product in the form of an attribute of a representation. We now briefly outline our approach to memory attributions (see also Jacoby & Kelley, 1987; Jacoby, Kelley, & Dywan, 1989; Kelley & Jacoby, in press).

Familiarity as an Attribution

We have noted that the use of memory as a tool is a nonanalytic process that does not specify the source of effects. For example, reading a word once allows it to be read later more fluently. Fluent processing can be correctly attributed to the past, and so can be experienced as a feeling of familiarity. More generally, we have argued that familiarity is the attribution of variations in perceptual and conceptual processing to a particular source (e.g., Jacoby, 1988; Jacoby & Dallas, 1981; Jacoby, Kelley, & Dywan, 1989). The fluency heuristic that we believe underlies the feeling of familiarity is in some ways similar to the availability heuristic that Tversky and Kahneman (1973) proposed as underlying judgments of probability. According to the availability heuristic, the probability of an event will be judged as high if one can easily bring to mind a prior occurrence of that class of events. Similarly, according to the fluency heuristic, an item seems familiar if it can be easily brought to mind or fluently processed. Familiarity is seen as the result of an inferential or attributional analysis; it is not present in the memory representation itself.

One implication of a fluency interpretation of familiarity is that it should be possible to create memory illusions. That is, fluency is the basis for familiarity, it should be possible to induce the feeling of familiarity by enhancing the processing of new items on a recognition memory test. We (Jacoby & Whitehouse, 1989) have done experiments on memory illusions that provide direct evidence for a fluency heuristic. Unconscious perception of a word flashed immediately prior to its presentation as a new word on a test of recognition memory produced an increase in the probability of false recognition. The flashed word produced more fluent perceptual processing of the new word, which was interpreted as familiarity. We could be certain that this effect resulted from unconscious perception of the flashed word: When conditions were changed so that people could "see" the flashed word, effects were opposite to those produced by unconscious perception. That is, we used the strategy of placing aware and unaware effects in opposition so as to reveal effects of unconscious perception on memory judgments.

Subjective Experience as a Basis for Judgments

Our distinction between analytic and nonanalytic processing is similar to distinctions found in theories that propose multiple bases for decisions (e.g., Atkinson & Juola, 1974). In a two-process theory of category membership decisions (e.g., Smith, Shoben, & Rips, 1974), there is a nonanalytic process of assessing overall similarity of an instance to a category on the basis of character-

istic features. In addition, people can use a more analytic process of checking for defining features. Mandler (1980) proposed that recognition memory decisions can be based either on familiarity or on retrieval of study context. Familiarity serves as a nonanalytic basis for recognition memory judgments, in addition to the more analytic retrieval of study context. Elsewhere, we have discussed the differences between analytic and nonanalytic processes (Jacoby & Brooks, 1984; Jacoby & Kelley, 1987). The important distinction here is that nonanalytic processing is more global or wholistic, whereas analytic processing segments and selects.

The use of memory as a tool can influence subjective experience. These effects are important because subjective experience serves as a nonanalytic basis for judgments. The unconscious influence of past experience used as a tool can influence fluency of processing in a task. Subjects can misattribute this fluent processing to changes in physical parameters of the later presentation, such as longer visual duration (Witherspoon & Allan, 1985) or lower background noise (Jacoby, Allan, Collins, & Larwill, 1988). Fluent processing may also be misattributed to a statement's being true, an argument's seeming to flow, or a problem's being easy (Jacoby & Kelley, 1987). The effect of "mere exposure" in studies of aesthetic judgments may also be a case of the misattribution of fluent processing that is actually due to prior experience (Jacoby, 1984; Mandler, Nakamura, & Van Zandt, 1987; Seamon, Brody, & Kauff, 1983). Subjects prefer random polygons or melodies encountered in an earlier phase of the experiment to new items. Prior exposure produces more fluent processing of old items that may be misattributed to qualities of the items (e.g., that they have good form or are pleasing). People attribute effects on performance to whatever source is most obvious or plausible, which often depends on the question they are asked.

Multiple bases for judgments are probably also used in social situations (e.g., Zanna & Rempel, 1988). Tasks such as judging the level of background noise might be useful as a means for revealing nonanalytic judgments in those situations. To illustrate this possibility, let us further consider the effects of prior experience on the judgments of background noise. In one experiment, we (Jacoby et al., 1988) presented previously heard sentences and new sentences against a background of white noise of varying loudness. Subjects judged the background noise as less loud when the sentences were old rather than new. The difference in ease of perception of old and new sentences was misattributed to a lower level of background noise. That is, people were unable to separate out the contribution of memory to perception when judging noise level, and so experienced a change in their subjective experience of the noise. Later experiments by a student in our laboratory, Jane Collins, have shown that people are unable to avoid this effect of prior experience on judgments. Even when subjects were informed about the effect and told to avoid it, they continued to judge the background noise accompanying old sentences as less loud than that accompanying new sentences. Unlike the fame judgment experiments, in which people could use a simple rule to avoid the effects of prior experience ("If you recognize the name, it is nonfamous"), people in the noise experiment had no analytic basis for correcting their judgments. To correct noise judgments for the effect of prior experience, subjects

would have had to regain the subjective experience of a naive listener. Doing so is apparently impossible.

The noise judgment task may show effects of motivational variables as well as effects of prior experience. For example, the background noise accompanying a statement of a belief may be judged as less loud if one agrees with the stated belief. Also, emotional reactions produced by a statement may be reflected by a difference in judged loudness of background noise accompanying that statement. Experiments of this sort are now underway.

Our use of effects on background noise as an indirect test of memory and of the effect of motivational variables is akin to the approach taken by advocates of the "New Look" movement in perception (e.g., Eriksen, 1966). We are using judgments of a physical dimension, such as the loudness of a background noise, in much the same way as one would use a projective test to reveal unconscious influences on judgments. The advantage of our procedure over the use of standard projective tests (e.g., a Rorschach test) is that judgments of a physical dimension can be scored easily and objectively. Also, our procedure does not ask for a report that can readily be taken as self-revealing, so people are less likely to be defensive than when taking standard projective tests. Even if people are defensive, our results show that they are unable to avoid showing effects of memory on noise judgments. Perhaps the same will be found for motivational variables. Our goal is to show dissociations between effects on direct and indirect tests of motivation that are similar to those shown on direct and indirect tests of memory. For example, noise judgments (an indirect test) may show that a presented statement gives rise to some emotional reaction, although, when directly asked, a person may deny that the statement provoked emotion. More rational, analytic bases for judgment may often produce judgments that differ from nonanalytic judgments evidenced by performance on an indirect test.

CONCLUDING COMMENTS

The possibility of unconscious influences of memory has, until recently, generally been ignored. Measures such as performance on tests of recognition memory or free recall were the standards for assessing memory for prior episodes. That this is true can be shown by considering Hastie and Park's (1986) distinction between memory-based and on-line judgments. Hastie and Park required that a judgment be correlated with memory as assessed by a test of free recall to qualify as a memory-based judgment. For example, they computed the correlation between subjects' judgment of the suitability of a described person for a job and indices computed from free recall of items of information favoring or opposing the person. If the correlation was high, Hastie and Park concluded that the judgments were based on memory, whereas if the correlation was low, they concluded that the judgments were made on-line. The difficulty is that a low correlation between judgments and a measure of memory may result from an experimenter's using the wrong measure of memory. Memory for a prior experience can have effects on

performance even when a person is unable to recall or recognize the prior experience. Given that this is the case, assessing the correlation of judgments with free recall is inadequate as a means of determining whether or not judgments are based on memory.

The finding of unconscious influences of memory means that one cannot rely on a person's verbal report to determine whether or not the person has been influenced by memory for a prior event. A failure to recall or recognize an earlier event might be taken as evidence that any effect of that event on performance of a later task was produced by the priming of some abstract representation; however, effects of prior experience can be too long-lasting and too context-specific to be produced by priming. Factors that influence encoding and retrieval are important for unconscious influences of memory. An episodic view leads to the prediction that effects on perception and judgment will be specific to very local context. Unconscious influences of memory can be clearly separated from aware uses of memory by arranging a situation such that effects of the two types are placed in opposition. There are multiple bases for judgments. Nonanalytic judgments are more open to unconscious influences of memory than are analytic judgments.

At a very general level, we believe that a fundamental issue for theories of motivation is the relation between habit and reason. The limited success of learning theories can be taken as showing that habit alone is insufficient as an account for all of human behavior. Behavior is also too often unreasonable to be fully guided by reason. It is the conflict between reason and habit that we find most interesting. People often do behave, presumably because of habit, in ways that are obviously counter to any reasonable assessment of their own selfinterests. Notions such as habit are identified with unconscious influences. The motivation for a behavior is most likely to be brought into question when the behavior appears to be irrational. The strategy that we are using is that of producing conflicts between reason and habit so as to separate the two as different sources of control for behavior. One reason for ending this chapter by using the very global terms "reason" and "habit" is that terms of this sort are often used to describe the different levels of control. What is needed is a better understanding of habit as well as a better understanding of reason. For us, habit is memory for prior episodes.

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