

Affect and Information Processing

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The most active area of research and theory of social information processing to emerge in the past two decades (for reviews, see Fiske & Taylor, 1991; Higgins & Sorrentino, 1990; Sorrentino & Higgins, 1986; Wyer & Srull, 1984, 1994) concerns the cognitive determinants and consequences of affect and emotion. A seemingly unlimited number of issues have been investigated. Some research addresses the dimensionality of emotional reactions to stimuli (Smith & Ellsworth, 1985) and the factors that give rise to these reactions (Abelson, 1983; Ortony, Clore, & Collins, 1988; Roseman, 1984, 1991). Other work focuses on the influence of affect on the encoding and organization of new information in memory (Bower, 1981, 1991), its impact on the retrieval of previously acquired concepts and knowledge (Blaney, 1986), the use of affect as a basis for judgments and decisions (Clore, 1992; Schwarz & Clore, 1983, 1988), and its influence on the cognitive strategies that individuals adopt when they perform cognitive tasks (Isen, 1987; Mackie & Worth, 1989; Schwarz & Bless, 1991). This research has shown how affective reactions can affect creativity (Isen, Daubman, & Nowicki, 1987; Isen, Johnson, Mertz, & Robinson, 1987), the impact of persuasive messages (Bless, Bohner, Schwarz, & Strack, 1990; Mackie & Worth, 1989); impression formation (Isbell, Clore, & Wyer, 1998); stereotyping (Bodenhausen, 1993; Bodenhausen, Sheppard & Kramer, 1994); self-evaluations (Levine, Schwarz, & Wyer, 1994; Schwarz & Clore, 1983) and political judgment (Abelson, Kinder, Peters, & Fiske, 1982; Isbell & Wyer, 1998; Ottati & Isbell, 1996; Ottati & Wyer, 1992).

In this chapter, we develop a conceptualization that incorporates the implications of these diverse phenomena and the cognitive processes that underlie them. Our formulation specifies the possible determinants and consequences of the affect that individuals experience in both laboratory and daily life situations. In doing so, it takes into account the phenomena implied by many existing theories of affect and cognition. In many cases, however, it suggests interpretations of these phenomena that differ from those that have typically been proposed.

One basic assumption of our conceptualization distinguishes it from other formulations of affect and cognition (e.g., Bower, 1981; Forgas, 1992, 1995; Isen, 1987; Wyer & Srull, 1989).

Specifically, although affective reactions can be responses previously acquired concepts and knowledge that are activated in memory, and although one can have concepts about their own and others' reactions, affect per se is not itself part of the cognitive system. This assumption places restrictions on the ways that affect can influence information processing. As we will argue, many phenomena in which affect has been hypothesized to play a role may be due instead to the semantic concepts that accompany different affective and emotional states. In fact, we propose that affective reactions per se enter into information processing in two primary ways:

1. Positive and negative affect can be learned responses to external or internal stimuli. Once acquired, these responses may become preconditions for cognitive operations of the sort that compose procedural knowledge (J. Anderson, 1983; Smith, 1990) and govern behavior in specific types of situations to which they are relevant. Once these procedures are activated, they can influence responses to new information without conscious awareness.

2. The affective reactions that one experiences at a given moment can be used as information about one's attitude toward either oneself, other persons, situations with which one is confronted, the outcomes of behavior in these situations, and the appropriateness of certain strategies for attaining specified processing objectives. Consequently, affect can influence both judgments of these entities and behavioral decisions that concern them. Moreover, it can affect the type and amount of goal-directed activity one performs. These conclusions are embodied in six postulates that concern the impact of affect on goal-directed information processing and the conditions in which this influence occurs. These postulates, along with empirical evidence bearing on their validity, are presented in the context of issues to which they are relevant.

## I. PRELIMINARY CONSIDERATIONS

### A. Affect vs. Cognition

#### 1. Definition

Affect refers to the positively- or negatively-valenced subjective reactions that a person experiences at a given point in time. These reactions are experienced as either pleasant or unpleasant feelings. Affective reactions can be elicited either by perceptions of one's immediate

stimulus environment or by thoughts about past or future events. Affect can also be elicited by psychedelic drugs, painful or pleasurable physical stimulation, or proprioceptive cues (e.g., facial expressions; see Strack, Martin, & Stepper, 1988; Zajonc, Murray, & Inglehart, 1989), although it is generally an internal response to a set of newly-formed or previously-acquired cognitions.

Although our conceptualization of affect seems relatively noncontroversial, it should be distinguished from the implicit or explicit definitions employed in other formulations. For example, some theories (e.g., Fiske & Pavelchak, 1986) equate affective reactions to a stimulus with evaluations of the stimulus. In contrast, others (e.g., Zajonc, 1980) assume that these reactions are totally separate from the cognitive system that assigns "meaning" to these stimuli. We also do not view affective reactions per se as part of the cognitive system. We nevertheless assume that these reactions are frequently elicited by cognitions, and that they provide the basis for assigning evaluative meaning in ways we elaborate presently.

Affective reactions to a stimulus configuration can often reflect learned responses to a subset of the features that compose this configuration (Clore & Byrne, 1974; Lott & Lott, 1985; Staats & Staats, 1958). For example, if a man has a positive affective reaction to a woman he meets for the first time, he may later experience a similar reaction upon seeing the woman across the room or hearing someone mention her name. Thoughts about the woman or about aspects of the original interaction might elicit a similar reaction. The intensity of these latter reactions depends in part on the proportion of original stimulus features that are represented in the thoughts that occur.

The features of an affect-eliciting stimulus event do not need to be clearly articulated. That is, a person may respond configurally (or schematically) to a stimulus situation without identifying its individual components (Clore & Ortony, in press). This appraisal often occurs spontaneously, without conscious awareness of the particular situational features that elicit it. An articulation of these specific features might occur only subsequently, if there is a particular reason to identify them.

## 2. Affect and Declarative Knowledge

Affect can be a response to either a previously-formed mental representation of a person or event that is retrieved from memory, or a new representation that is constructed of one's immediate environment. Moreover, it can occur in the course of imagining hypothetical situations. (This is presumably accomplished by combining affect-eliciting features of existing concepts and knowledge to form a new representation.) It is important to note, however, that although affective reactions can be responses to concepts and schemata that compose declarative knowledge, and can also be the referents of concepts and knowledge, they are not themselves part of the cognitive system.

This distinction is central to the conceptualization we propose. That is, people obviously form concepts about affective reactions, and they may use these concepts to interpret their responses to new experiences. Moreover, they may spontaneously apply these concepts (like other types of concepts) to configurations of stimulus features that exemplify them. Thus, one may spontaneously apply the concept "happy" to a configuration of subjective reactions in much the same way one applies "chair" to a physical stimulus whose features exemplify this concept.

Thus, a person who subjectively experiences a certain configuration of affective reactions may label these reactions as "angry," "happy," or "feeling great," based on a previously formed semantic concept that refers to them. Moreover, once applied, this concept can become part of a mental representation of the experience in which this affect occurred. However, the reactions themselves are no more part of the cognitive system than are the referents of other concepts and knowledge structures (e.g., the persons, objects or events that one encounters in daily life). The only difference is that the referents of the latter concepts are typically external to the perceiver, whereas the referents of affect-related cognitions are internal.

Other similarities in the use of affect-related concepts and other concepts are worth noting. First, both types of concepts can be applied to a referent without consciously assigning the referent a verbal label. Thus, one might spontaneously recognize a stimulus object as a chair without consciously labelling it as such. Similarly, one might activate and use a concept of one's affective state without consciously labelling the state as "happy" or "sad." Second, several

different sets of features can exemplify the same concept, and exposure to these features might activate it. Affect-related concepts, for example, might be activated by external stimulus features, such as another person's facial expression, behavior or tone of voice, as well as by internal reactions. Thus, these concepts can potentially be applied to other persons as well as to oneself.

Our assumption that affective reactions are not themselves features of the mental representations that compose declarative knowledge distinguishes our theory from other conceptualizations of the role of affect in information processing (e.g., Bower, 1981; Forgas, 1992, 1995; Isen et al., 1978; Wyer & Srull, 1989). These theories assume that affect functions as a concept in memory that, like other concepts, can influence the interpretation of new information and can cue the retrieval of previously acquired knowledge. If, on the other hand, affect is not itself a feature of the concept and knowledge representations that are stored in memory, there is no reason to suppose it will have these effects. We discuss these alternative possibilities in more detail later in this chapter.

### 3. Affect and Procedural Knowledge

Although affective reactions are not represented in declarative knowledge, they could potentially play a role in procedural knowledge. Anderson (1983; see also Smith, 1984) postulates the existence of cognitive "productions". These productions can be conceptualized metaphorically as "IF[X], THEN[Y]" rules, where [Y] is a sequence of cognitive or motor acts and [X] is a configuration of internally generated stimuli (thoughts, perceptions or bodily sensations) that serve as a precondition this sequence. The features of such a precondition can include both affective reactions and cognitions about the situation in which the reactions occur. However, these reactions need not be interpreted in terms of concepts drawn from declarative knowledge; persons might not even be consciously focusing on them. To this extent, the affective reactions that people experience in a situation could influence their responses to the information they receive independently of the interpretation, if any, that they place on these reactions. These possibilities are also considered in the conceptualization we propose.

## B. Related Constructs

### 1. Moods and Emotions

Many types of affective reactions can be experienced, each of which is elicited by a different configuration of cognitions. These cognitions could concern either specific aspects of a real or imagined situation or a more global impression of the situation as a whole (Lazarus, 1982, 1991). The cognitions could also pertain to past or future experiences. Once affective reactions are elicited, they may persist for a period of time after the cognitions that gave rise to them are no longer activated.

Affective states that occur in response to cognitions about actions, events, or objects, these affective reactions are termed emotions (Clore, 1994). The particular emotion that one experiences depends on not only the stimulus event itself but also the interpretation that is placed on it (Ortony et al. (1988; see also Abelson, 1983; Roseman, 1991). This means that the same event can often elicit different emotions, depending on the perspective from which it is viewed and the aspects of the event to which one attends. For example, suppose a boy's alcoholic uncle has pawned the child's favorite toy to buy a bottle of scotch. The boy is likely to experience sadness if he focusses on the consequences of the event for himself, but might experience anger if he considers the uncle's behavior. On the other hand, the uncle might experience happiness if he thinks about the event's consequences for himself but feel guilty if he thinks about his behavior and its consequences for the boy. One implication of this conceptualization is that an individual's emotional reactions to a situation can change abruptly, depending on the cognitions about it that happen to come to mind.

Once the cognitions associated with an emotion-eliciting experience are no longer activated, however, the reactions that were stimulated by them take time to dissipate. These reactions, which are experienced without concurrent activation of concepts about their source, are referred to as moods (for an elaboration of this distinction, see Clore, 1994; Clore et al., 1994). This implies that every emotion that is elicited by a cognitive appraisal may have a corresponding mood, or residual affective state, that is experienced for a period of time after a

representation of the appraised event is no longer activated.

Although persons can theoretically experience only one emotion at a time, their moods could in principle reflect the residual affect of several different emotions. The theoretical and empirical implications of this possibility have rarely if ever been explored. For one thing, the affective reactions associated with different cognitive appraisals of a situation can potentially differ in terms of both the time required to reach their maximum intensity and their rate of decay once the cognitions that elicited them are no longer activated (Frijda, Ortony, Sonnemans, & Clore, 1982). An understanding of the different rates of onset and decay that characterize different types of affect could provide insight into both the immediate and long-range effects of emotional experiences and the impact of new events that distract one from thinking about them. Thus, suppose a man whose wife has left him experiences both anger and sadness in close temporal contiguity. The relative magnitudes of these feelings once the precipitating event is no longer thought about could depend on the relative rates of decay of the two types of reactions as well as the recency of the thoughts that elicited them. Similar considerations underlie the conditions in which positive feelings induced by a happy experience will override the negative feelings that result from an earlier, unhappy event.

## 2. Attitudes and Evaluations

One's affective reactions to an object can often provide a basis for evaluating the object. These evaluations are often assumed to express attitudes (Eagly & Chaiken, 1993; Fazio, 1986).<sup>1</sup> We do not distinguish between attitudes and evaluations in the theory we propose. However, we do distinguish between the criteria that are used as a basis for these judgments, and also between the conditions in which these criteria are applied (for a similar distinction, see Niedenthal & Setterlund, 1994; Zanna & Rempel, 1988).

Specifically, affect-based evaluations are based principally if not exclusively on affective reactions. The most obvious evaluations of this type pertain either directly or indirectly to one's feelings about oneself or others. For example, they include one's feelings about one's general life situation (e.g., subjective well-being; see Schwarz & Clore, 1983; Seidlitz, Wyer, & Diener,



1997), about oneself (e.g., judgments of self-esteem) or about other persons (e.g., judgments of love, anger, or amusement). In contrast, descriptively-based evaluations are typically based on declarative knowledge about the person or object being judged. For example, judgments of positively- or negatively-valenced personality traits (honesty, intelligence, etc.) might be based on specific behaviors that exemplify them. Or, the consequences of an action (having an abortion, going to the dentist, etc.) might be evaluated on the basis of beliefs that they would facilitate or interfere with one's social or personal objectives. The descriptive and affective bases for an evaluation may have different implications. Going to the dentist, for example, might elicit negative affective reactions but be necessary in order to attain a desired goal (not losing one's teeth). By the same token, eating a hot fudge sundae might elicit positive affect but interfere with one's goal of losing weight. When both descriptive and affective criteria are potentially relevant to an evaluation, their relative impact might depend in part on which criterion comes to mind most quickly and easily (Levine, Wyer & Schwarz, 1994).

## II. AFFECT AND INFORMATION PROCESSING: A CONCEPTUAL INTEGRATION

The role of affect in goal-directed information processing must be understood in the context of a more general conceptualization of the cognitive activities that mediate goal-related judgments and decisions. A number of recent processing models rely on current connectionist and parallel-distributed-processing assumptions (e.g., Smith, 1996; Kashima & Kerekes, 1994; Vallacher & Nowak, 1994). For our present purposes, however, a sequential-stage processing model is particularly useful. The stages of processing we postulate to occur in response to stimulus input information are similar to those assumed by Wyer and Srull (1986; 1989; see also Wyer & Radvansky, in press). Specifically:

1. When people encounter new stimulus information, they retrieve semantic and episodic knowledge from memory that they can use to interpret it and construe its implications. The likelihood of using any particular subset of knowledge is a joint function of its applicability and its accessibility in memory. Thus, when more than one set of previously formed cognitions is equally applicable, the set that comes to mind most quickly and easily is most likely to be

applied.<sup>2</sup>

2. Once people have interpreted new information in terms of previously acquired concepts and knowledge, they operate upon it in ways they believe will attain the specific objectives to which the information is relevant. These objectives can be either internally generated or externally imposed. The specific sequence of cognitive operations that is performed, which may often constitute a cognitive procedure as conceptualized earlier (J. Anderson, 1983; Smith, 1984, 1990, 1994), depends on the goal being pursued as well as the type of information being processed (for analyses of the role of goals in information processing, see Smith, 1994; Srull & Wyer, 1986; Wyer & Srull, 1989).<sup>3</sup>

3. People generate a subjective output, or "result," from the procedure they have employed and evaluate its utility for attaining the goal to which it is relevant. If they decide that this output is sufficient for attaining their goal, they make an overt response (e.g., a judgment or behavior) and terminate goal-directing processing. When multiple responses are required for goal attainment, they may use the initial output they have generated to evaluate whether the strategy they have used to produce this output is appropriate and, therefore, to decide if they should continue exploring this strategy or adopt a different one.

The processes described in step 3 compose a feedback loop whereby the outputs of processing are continually being evaluated and processing continues until a result that fulfills one's processing objective has been obtained. (For other theories that postulate such a mechanism, see Carver & Scheier, 1981, 1990a, b, 1991; Miller, Galanter & Pribram, 1960; Simon, 1967.) The criterion for evaluating this result is not always clear. A man who is preparing for an examination, for example, may wish to continue studying until he feels that he "knows enough." However, whether this goal has been attained cannot easily be determined objectively. Rather, it may be based on the student's subjective "feelings" about his knowledge of the material.

Several specific theories of affect and cognition can be viewed as hypotheses about the role of affect to one or more of the stages of information processing described above. Figure 1

conveys these stages of processing and the sequence in which they typically occur. The numbered paths indicate the cognitive determinants of affect as well as its consequences for goal-directed processing. Thus they indicate the various ways in which both situational and individual difference variables could potentially influence the outcomes of goal-directed processing through the mediating influence of these variables on the affect that persons experience. Each numbered path is the subject of one or more theories of affect and cognition. On the other hand, not all of these paths are equally likely to exist. In the theory we propose, only those paths denoted by solid lines are postulated. This becomes clear in the discussion to follow.

### III. DETERMINANTS OF AFFECT

Affective reactions can theoretically be elicited by stimulus events either directly, with a minimum of cognitive mediation (Paths 1 and 3), or indirectly as a result of the interpretation that is placed on these events (Path 6). Affect can also be elicited spontaneously by thoughts about previously-encountered people and events, or by imagined future events whose features have become associated with affective reactions through prior learning (Path 5). Proprioceptive feedback can provide yet another source of affect (Path 2). Although some of these effects are self-evident, others require discussion.

Nonconsciously mediated affect elicitation (Paths 1-3). The possibility that internally generated proprioceptive stimulation elicits affect without any conscious cognitive mediation (Path 2) is a basic tenet of the facial-feedback hypothesis (Laird, 1974; for evidence supporting its validity, see Strack, et al., 1988; Zajonc, et al., 1989).

Zajonc (1980; Murphy & Zajonc, 1993; Zajonc & Markus, 1984) postulated that external stimulus events can also elicit affect without any cognitive mediation (Path 3). Early support for this hypothesis was based on evidence that liking for novel stimuli increases with the frequency of exposure to these stimuli independently of the ability to recognize the stimuli as ever having been seen before (Kunst-Wilson & Zajonc, 1980; Moreland & Zajonc, 1979; Murphy & Zajonc, 1993). However, refined analysis of the data from these studies raise questions about the validity of the conclusions that were drawn (Birbaum, 1981; Birbaum & Mellers, 1970a, b; Wyer &

Srull, 1989).

In a quite different paradigm (Bargh, Chaiken, Raymond, & Hymes, 1995), participants on a series of trials were first exposed to a positively- or negatively-valenced word below recognition threshold, and then were asked to pronounce a similarly- or differently-valenced target word that followed it. Participants responded more quickly to a target word when it was evaluatively congruent with the word that preceded it than when it was incongruent. This difference occurred although participants had no insight into the fact that the valence of the words was of any concern. Bargh et al. (1995) interpreted these data as evidence that the initial word, although not consciously recognized, spontaneously elicited an evaluative reaction. This reaction either facilitated or interfered with the identification of the word that followed it, depending on whether the evaluative response elicited by the second word was similar or dissimilar.

Although these results could be interpreted as evidence for Paths 1 and 3, they do not necessarily indicate that affective and cognitive systems are independent. For one thing, cognitive responses to stimuli can also occur outside awareness (Bargh, 1997). Moreover, even assuming that evaluations of stimuli occur automatically, this does not necessarily mean that affective reactions are the basis for these evaluations. In fact, further research from Bargh's laboratory (Garcia, 1996; see Bargh & Alvarez, in press) suggests a somewhat different interpretation of his findings. In these studies, participants were exposed to unfamiliar priming stimuli that had been normatively scaled as favorable or unfavorable on the basis of pretesting but which they had personally never seen before. These novel priming stimuli influenced responses to subsequent target stimuli in much the same way as familiar primes. This means that the influence of priming stimuli on the processing of subsequent ones is not a result of affective reactions that had become associated with the primes through prior learning. Rather, the priming stimuli, although unfamiliar, spontaneously activated an evaluation process (i.e., a cognitive procedure, or production, as conceptualized earlier), and the results of this process either facilitated or interfered with the processing of subsequent stimuli that were also evaluated

spontaneously.

In fact, the phenomena identified by Bargh and his colleagues may not bear on the automatic elicitation of affect at all. Rather, they may reflect an automatic categorization process that is not affect-eliciting in and of itself. That is, persons may spontaneously categorize stimuli as either "good" or "bad". (This automatic categorization process could reflect an unlearned, evolution-based disposition to identify stimuli as potentially harmful or not harmful in order to survive.) However, affective reactions might not provide the basis for this categorization. Rather, these reactions might only be elicited in the course of a post-categorization cognitive process that requires an appraisal of the stimulus and its implications. If this two-stage evaluation process exists, it could help to resolve a controversy between Bargh et al.'s claim that evaluative responses are automatically elicited by stimuli independently of attitude intensity, and Fazio, Sanbonmatsu, Powell, and Kardes's (1986) conclusion that automatic attitude activation increases with attitude strength. The arguments that surround this debate are subtle and complex (cf. Chaiken & Bargh, 1993; Fazio, 1993). The above conceptualization, however, suggests that the two parties to the debate might be focussing on different stages of a two-stage process, and that their positions are not, in fact, incompatible.<sup>4</sup>

Conclusions drawn by Winkielman, Zajonc, and Schwarz (1997) are also worth considering in this context. In this research, participants were subliminally exposed to happy or angry faces. Immediately following each face, they evaluated a relatively neutral Chinese ideograph. Although participants typically did not report experiencing affective reactions to the ideographs, they nevertheless evaluated them more favorably when the ideographs had been preceded by a happy face than when they had been preceded by an angry one. The authors concluded that participants experienced affective reactions to the facial expressions of which they were unaware, and that they used these reactions as an informational basis for their judgments of the ideographs (Schwarz & Clore, 1983; a more detailed discussion of the use of affect as information is provided later in this article). However, it seems equally plausible to assume that the faces did not elicit affective reactions per se, but rather, were spontaneously categorized as "good" or

"bad." Then, in the absence of other clear judgmental criteria, the category activated by each face was applied to the neutral stimulus that followed it, and the evaluation of the stimulus was based on this categorization. To this extent, Winkielman et al.'s results are quite consistent with our interpretation of Bargh et al.'s findings.

Cognitively-mediated affect (Paths 5 and 6). The concepts that individuals use to interpret a stimulus event can potentially be influenced by their information-processing objectives, the perspective from which they consider the event, transitory situational factors, and the chronic accessibility of different subsets of relevant concepts and knowledge. Their interpretation of the event, in turn, can influence the emotions they experience (Ortony et al., 1988; Roseman, 1991). On the other hand, affect can also be elicited by a more global cognitive appraisal of a situation that does not involve the identification of any specific feature (Lazarus, 1982, 1991).

The effects of cognition on affect are recognized in theories concerning the correlates of depression (Beck, 1982; Nolen-Hoeksema & Morrow, 1993) and ruminative thought (Martin & Tesser, 1996). Because the features of a previous experience that are retrieved from memory typically decrease in number over time,<sup>5</sup> the affect that is elicited is likely to decrease correspondingly. On the other hand, one's processing objectives can sometimes require the retrieval of affect-eliciting concepts that were not applied to an event at the time it occurred. In such cases, the emotional reactions one experiences when thinking about the event could be even stronger than they were at the time the event actually took place.

Individual differences in affect elicitation (Path 4). Chronic individual differences can exist in the intensity and duration of affect elicited by an event (Diener, Colvin, Pavot, & Allman, 1991; Diener, Sandvik, & Pavot, 1991; Larson & Diener, 1987; Seidlitz, Wyer, & Diener, 1997), for example, found that people with chronically high subjective well-being perceived positive life experiences as more intense (but not more enduring), and perceived negative experiences as less enduring (but not less intense), than persons with low subjective well-being. Individual differences can also exist in the importance attached to the feelings one experiences, the ability to distinguish between different types of affective reactions, and the tendency to ruminate about

these reactions (Bagby, Parker, & Taylor, 1984; Emmons, 1992; Gohm & Clore, 1996; Salovey, Mayer, Goldman, & Palfei, 1994; Wyer, 1996).

Summary. Affective reactions can be elicited by proprioceptive stimulation (Path 2), by cognitions about the immediate situation in which one finds oneself, (Path 5) and by thoughts about past and future situations (Path 5). These cognitions may be either well articulated or may consist of an undifferentiated appraisal of a situation that does not require attention to, or even awareness of its individual features (e.g., LeDoux, 1996). External stimuli may elicit affect through the mediating influence of these cognitions. However, these stimuli are unlikely to have a direct impact on affective reactions that is not mediated by cognition. Therefore, Paths 1 and 3 are unlikely to exist.

#### IV. COGNITIVE CONSEQUENCES OF AFFECT: MEMORY AND ENCODING PROCESSES

Affect has been postulated to influence information processing at a number of different stages. Different theories concern the impact of affect on the retrieval of previously acquired concepts and knowledge from memory (Path 7), on the interpretation of new information (Path 8), and on the cognitive operations that are performed in processing this information (Path 9). Affect has also been postulated to have direct informational effects on both the responses that are made to a stimulus (Path 10) and on the evaluation of these responses (Path 11).

According to the formulation we propose, however, Paths 7 and 8 may not exist. Moreover, many influences of affect on information processing may be mediated by the impact of affect on response evaluation (Path 11) and may not reflect a direct influence of affect on the motivation or ability to think extensively about the information provided (Path 9). These conclusions follow from our assumption that affective reactions can be responses to the concepts and cognitions that compose declarative knowledge, and can also be referents of this knowledge, but are not themselves part of the mental representations that compose this knowledge.

As we will indicate, many experiments that have claimed support for the consequences of affect described by Paths 7-11 are subject to alternative interpretation. The existence of an

alternative interpretation of research findings does not, of course, invalidate the original one. However, the conceptualization we propose is quite compatible with much of the research performed to date, and can account for results that other formulations cannot.

#### A. The Influence of Affect on the Accessibility of Declarative Knowledge

If affective reactions are features of the cognitions that compose declarative knowledge, they should have the same impact on information processing as other, semantic features. That is, the experience of these reactions should increase the accessibility in memory of concepts and knowledge representations with which they are associated. Thus, for example, happy persons should tend to recall and use positively-valenced concepts and knowledge whereas sad individuals should be more disposed to recall and use negatively-valenced cognitions (Bower, 1981).

Our conceptualization does not make this prediction. The physiological reactions that exemplify a particular affect-related concept (e.g., "happy," "angry," etc.) may sometimes be interpreted in terms of this concept and, therefore, may activate the concept in much the same way as exposure to a specific external stimulus (e.g., a chair) activates a semantic concept it exemplifies. However, this process may not occur unless the reactions being experienced (a) are above some minimal level of intensity, and (b) clearly exemplify a single, preexisting concept. The following postulate summarizes this contention:

Postulate 1. Affective reactions may activate a specific affect-relevant concept that can be used to interpret them. However, affective reactions do not spontaneously influence the accessibility in memory of other similarly-valenced semantic concepts and declarative knowledge.

The conditions in which affective reactions are and are not likely to be associated with the recall and use of declarative knowledge can be conceptualized by considering this postulate in the context of our previous discussion of the conditions in which affective reactions are elicited. Three general conditions were identified.

1. Affect can be elicited by proprioceptive cues. This affect, however, is typically of low



intensity. Therefore, it may not normally receive conscious attention, and not may be spontaneously interpreted in terms of an affect-related semantic concept. Consequently, it is unlikely to influence the accessibility of declarative knowledge.

2. Affect can be elicited by a global cognitive appraisal of a situation that does not require attention to its specific features (Lazarus, 1982). If the affect that results from such an appraisal is of very low intensity, a spontaneous comprehension of it in terms of a specific affect-related concept it exemplifies may not occur. If the affect is moderately intense, it might be comprehended in terms of an applicable semantic concept but may inspire little effort to understand the conditions that gave rise to it. Consequently, this affect is also unlikely to affect the retrieval of more general concepts and knowledge. However, if the affect that is elicited by one's initial appraisal of a situation is very intense, it may stimulate an attempt to explain its occurrence. As a result, the concepts and knowledge that are involved in this cognitive activity may become temporarily more accessible in memory.

3. Affect can be elicited by cognitions about specific events that occur in a new situation or by thoughts that occur in the course of complying with external situational demands. For example, people who receive feedback about their performance on an achievement test may spontaneously think about their competence and intelligence, and these thoughts, in turn, may elicit affect. Or, the events that occur in a movie might require the activation and use of concepts and knowledge with which affect is associated. Thoughts about a past experience can also elicit affective reactions in the course of describing the experience to others. In all of these cases, the affect that people experience is accompanied by previously acquired semantic concepts and cognitions. Once these concepts are activated, they could cue the retrieval of declarative knowledge that is descriptively related to them. Moreover, this could occur independently of the affective reactions that happen to accompany the concepts.

Figure 2 summarizes the implications of this analysis. Dashed lines indicate the direct influence of affect on the retrieval and use of semantic and episodic knowledge postulated by Bower (1981) and others (Forgas, 1995; Isen et al, 1978). Solid lines indicate the relations

implied by Postulate 1. That is, affective reactions do not directly influence the retrieval of previously acquired declarative knowledge. Their influence, if any, is indirect, being mediated either by semantic concepts that are applicable for interpreting the reactions or by thoughts that are generated in an attempt to explain their occurrence. On the other hand, cognitions about features of the situation in which affective reactions occur can have an impact on the accessibility and use of previously-formed cognitions independently of the affective reactions that the situation elicits.

Three bodies of research bear on these possibilities. The first concerns the assumption that affect increases the accessibility of the specific affect-related semantic concepts it exemplifies, but does not spontaneously influence the accessibility of other valenced concepts that are irrelevant to its interpretation. The second concerns the influence of affective reactions on the interpretation and selective encoding of new information into memory (Path 8). The third body of research focuses on the impact of affect on the recall of previously acquired episodic knowledge (Path 7). In much of the research, effects of affect that participants experience in the situation being investigated cannot easily be distinguished from the effects of concepts and knowledge that have been activated by the procedures used to induce this affect. Nevertheless, some tentative conclusions can be drawn,

#### 1. The Influence of Affect on Semantic Concept Accessibility

According to Postulate 1, affect spontaneously influences the accessibility of only those semantic concepts that can be used to interpret the specific type of affective reactions being experienced. Two sets of studies potentially bear on this hypothesis. First, Bargh and his colleagues (Bargh, 1997) showed that exposure to stimulus words increases the ease of recognizing other words that are similar in valence, but decreases the ease of recognizing words that differ in valence. As we have already pointed out, however, Bargh's findings may reflect a categorization process that is automatically activated by exposure to a stimulus, and do not necessarily indicate that affect per se influences semantic concept accessibility.

Experiments by Niedenthal and her colleagues (Niedenthal & Setterlund, 1994; Niedenthal,

Halberstadt, & Setterlund, 1997) provide direct support for the conceptualization we propose. Participants were induced to feel either happy or sad as a result of listening to classical music that was either upbeat (e.g., Eine Kleine Nachtmusik) or gloomy (e.g., Rachmaninoff's Piano Concerto No. 2). The music was determined on the basis of normative data to induce happiness or sadness in particular rather than other types of positive and negative feelings (Niedenthal et al., 1997). However, participants were told that the study was intended to investigate the relation between auditory and visual perception, and were given no indication of the affective reactions the music was intended to elicit.

After listening to the music for 12-15 minutes, participants performed a word recognition task. Some words referred to feelings and behavior similar to those that participants were experiencing (e.g., delight, joy, weep, despair, etc.). Others, however, referred to concepts that were positively- or negatively valenced but either referred to different emotions than those participants were experiencing (pride, fear, anger, etc.; see Niedenthal et al., 1997) or did not refer to emotions at all (e.g., "wisdom," "luck," "crime," "injury," etc.; see Niedenthal & Setterlund, 1994). Participants identified affect-related words more quickly if the words described feelings similar to those they were experiencing at the time. In other words, semantic concepts denoted by these words were made more accessible in memory as a result of the feelings that participants were experiencing. In contrast, the accessibility of words that described other positive and negative emotions, or that described positively- and negatively-valenced persons, objects and events that were unrelated to emotions, was not influenced at all by the affect that participants were experiencing. This pattern of results, which was replicated in several different studies, is quite consistent with Postulate 1.

Two further implications of the results are of particular importance. First, the results support our contention that not all positively-valenced and negatively-valenced stimuli elicit affect. That is, evaluations can be based on other, nonaffective criteria as well. In the absence of this assumption, the contingency identified by Niedenthal and her colleagues would be difficult to reconcile with the automatic evaluation effects reported by Bargh (1997), which generalize

over all types of stimuli.

Second, if people's affective reactions typically influence the accessibility of only those semantic concepts that are exemplified by the specific reactions being experienced, the effects of these reactions on the interpretation and recall of information should be similarly restricted. Put another way, any more general influence of induced affect on the selective encoding, interpretation and retrieval of valenced information are likely to occur for reasons that have little to do with affect per se.

## 2. The Influences of Affect on the Interpretation and Selective Encoding of New Information

Selective encoding. If the affect that people experience increases the accessibility of affect-related semantic concepts, information that is easily interpretable in terms of these concepts should be more likely to receive attention than other information and, therefore, should be more likely to be retained in memory. Although several studies bear on this possibility, their interpretation is equivocal. In a study by Forgas and Bower (1987), participants were induced to feel either happy or unhappy by giving them positive or negative feedback about their performance on a test of social adjustment. Then, they were asked to form impressions of hypothetical individuals on the basis of behaviors that varied in favorableness along dimensions of competence, intelligence, likableness and happiness. Participants spent more time thinking about the descriptions, and consequently had better recall of these descriptions later, if the descriptions were evaluatively congruent with their moods.

However, these findings must be considered in the context of Neidenthal and Setterlund's (1994) evidence that affective reactions only increase the accessibility of semantic concepts that are descriptively related to the feelings that participants are experiencing. If this is true, these reactions should not influence the attention paid to positively-valenced and negatively-valenced information in general. This means that the effects observed by Forgas and Bower, which pertain to information that is not directly mood-related, must be due to other factors. It seems reasonable to suppose that the performance feedback that Forgas and Bower used to induce affect also

elicited thoughts about competence, likableness and other attributes implied by the behaviors that participants read subsequently. Semantic concepts activated by these thoughts, rather than the affective reactions accompanying them, could easily have influenced the attention paid to these behaviors and the likelihood of encoding them into memory.

An earlier series of studies, by Bower, Gilligan, and Montiero (1981), is also noteworthy. Participants were induced through hypnosis to feel either happy or sad by recalling a past experience and were then given a posthypnotic suggestion to maintain this affective state while they read a story. In some conditions, the story concerned two persons, one of whom had very favorable experiences and the other of whom had a series of misfortunes. Participants had better recall of the information about the character whose experiences were congruent in valence with the affect they were experiencing. When participants' moods were induced after they had read the story rather than before, however, mood had no influence on the type of information they recalled. Thus, the effects were due to the selective attention to and encoding of affect-congruent information at the time this information was received. Some of this information described feelings of the characters that were similar to those that participants were themselves experiencing. Therefore, this selective encoding could be attributable in part to the greater accessibility of semantic concepts that referred to these feelings. On the other hand, the mood-induction procedures employed by Bower et al. explicitly mentioned the moods that participants should experience. The concepts activated by these procedures are likely to have remained accessible in memory after participants were dehypnotized.<sup>6</sup> Therefore, they may have affected the attention paid to aspects of the information that could be interpreted in terms of them and the recall of these aspects later.

Our reinterpretation of Bower et al.'s findings is consistent with conclusions drawn by Mayer, Gayle, Meehan, and Haarman (1990). They argued that if affective reactions per se were the determinant of mood-congruent effects on recall, these effects should increase with the intensity of the affect that participants experienced. In a study of the effects of induced mood on the recall of positively- and negatively-valenced words, however, they found no evidence that

this was the case (see also Blaney, 1986). As the authors conjectured, it seems likely that the impact of the mood-induction procedures they used was primarily due to the cueing properties of the cognitions that accompanied the moods that participants experienced and not to their affective reactions per se.<sup>7</sup>

Interpretation of ambiguous information. If affective reactions spontaneously activate semantic concepts that concern these reactions, they should increase the likelihood of recalling and using the concepts to interpret information to which they apply (for summaries of the effect of concept accessibility on the interpretation of information, see Bargh, 1994; Higgins & King, 1981; Wyer & Srull, 1981, 1989). Several studies summarized by Forgas (1995) investigated this possibility. Bower (1981) reported that persons who were induced to experience either positive or negative affect interpreted the situations portrayed on TAT cards in a manner that was affectively congruent with their induced mood state. However, these differences could result from a tendency for persons to construct fantasies that are affectively consistent with their mood independently of the features of the TAT cards they were shown. Thus, the results do not necessarily indicate that persons actually interpreted the features of the cards they saw in terms of affect-congruent concepts.

In an experiment by Forgas, Bower and Krantz (1984), participants were induced under hypnosis to feel happy or sad as a result of writing about a past experience. Then, they watched a videotape of a previously recorded interaction between themselves and another person while they performed an achievement task. Happy participants identified more skilled behaviors, and fewer unskilled behaviors, than sad participants did. Note, however, that the behaviors that participants observed were not relevant to affect per se. Thus, there is no reason to believe that concepts activated by the participants' affective states per se would influence the interpretation or selective encoding of the behaviors they observed (Niedenthal & Setterlund, 1994). It seems more reasonable, therefore, to assume that semantic concepts that mediated the effects obtained by Forgas et al. were activated by descriptive aspects of the procedures used to induce affect and not by the affect itself (see Footnote 6).

Although an unpublished study by Kelly and Wyer (cited in Wyer & Srull, 1989) avoided this ambiguity, the interpretation of their results is also equivocal. Briefly, persons who felt either happy or sad as a result of recalling a life experience read a story about someone whose affective reactions could be interpreted as exemplifying both of those emotions. (In one story, for example, a boy's grandmother died and left him enough money to attend the college of his choice.) Participants tended to interpret the protagonist's feelings as similar to those they were personally experiencing. These results could indicate that affect-relevant concepts associated with participants' own affective state influenced their interpretation of the protagonist's. However, the mood-induction procedure employed in this study explicitly asked participants to recall either a "happy" or "sad" experience. Thus, the semantic concepts activated by these instructions might have influenced participants' interpretation of the story rather than their affective reactions per se.

### 3. The Influence of Affect on the Retrieval of Episodic Knowledge

Numerous studies have attempted to demonstrate that experimentally-induced mood states cue the retrieval of previously-acquired knowledge that is evaluatively congruent with these states (for summary, see Forgas, 1995). In most of this research, however, the conditions that are necessary to demonstrate the cueing properties of affect per se have not been met. In the study reported by Bower (1981), for example, participants who had been induced under hypnosis to feel "happy" were later more likely to recall happy childhood experiences, and less likely to recall unhappy ones, than individuals who had been induced to feel "sad." However, the mood-inducing instructions explicitly referred to the affective states that participants were induced to experience. It seems likely that these instructions activated concepts of the affective states they described, and that these concepts cued the retrieval of memory representations that contained features of the concepts (see Footnote 6). This may have occurred independently of the affect that participants were experiencing.

In fact, the support for the hypothesis that experimentally-induced mood states cue the retrieval of mood-congruent information appears to be weak and inconsistent (Blaney, 1986;

Bower, 1991; Bower & Mayer, 1985). In the previously mentioned study by Bower et al. (1981), participants read a passage containing both positively-valenced and negatively-valenced descriptions of persons and the events they experienced. When differences in participants' mood were induced before the passage was read, descriptions were better recalled when their valence was congruent with the affect participants were experiencing than it was incongruent. However, when the affect that participants experienced was not induced until after they had read the passage, it had no influence on the type of information recalled. In other words, any effects of participants' feelings on their recall of the information presented in this study resulted from processes that occurred at the time the information was first received and comprehended rather than at the time of retrieval.

Bower and Mayer (1985) suggested that experimentally-induced mood manipulations are often too weak to permit their effects to be detected. This contingency would of course be consistent with Postulate 1. That is, weak mood inductions are unlikely to stimulate participants to think spontaneously about their affective reactions and to interpret them in terms of affect-related concepts and knowledge. Without this mediating cognitive activity, an influence of mood on information retrieval should not occur.

As we have noted, a direct test of the proposed conceptualization requires the use of affect-induction procedures that do not themselves activate semantic concepts relevant to the material to be recalled. The few studies that have employed such procedures support this conceptualization. In research by Riskind, Rholes, and their colleagues (Rholes, Riskind, & Lake, 1987; Riskind, Rholes & Eggars, 1982), some participants were induced to experience depression by asking them to express a series of self-referent statements (Velten, 1968). In some cases, the statements were self-deprecating (e.g., "I am worthless"), whereas in other cases, they referred to unpleasant somatic conditions (e.g., "I am tired"). The two procedures were equally effective in inducing depression. However, only the first procedure influenced participants' recall of mood-congruent personal experiences. This indicates that affect per se was not sufficient to account for the differential recall of participants' past experiences in the two conditions.



A series of studies by Parrott and Sabini (1990) are particularly provocative. In one study, participants listened to either uplifting or depressing music under explicit instructions to use the music to get into a "happy" or "sad" mood. These participants subsequently recalled experiences in high school that were affectively congruent with the mood they were in, replicating Bower's (1981) results. In other conditions, however, participants listened to the same music for the ostensible purpose of judging its aesthetic quality, and no mention was made of the mood state being manipulated. In this case, participants recalled high school experiences that were affectively incongruent with the mood they were in. Naturally-occurring mood states (resulting from sunny or rainy weather, or from good or bad performance on an exam) also led to the recall of mood-incongruent past experiences.

The reason for the recall advantage of mood-incongruent knowledge when participants' mood was not explicitly labeled is somewhat speculative. However, results obtained in the aforementioned study by Strack et al. (1988) suggest an explanation. Specifically, an unobtrusive manipulation of the positive affect that participants were experiencing as they read a series of cartoons increased their estimates of how amused they were by the cartoons. In other words, they used their affect as a basis for these estimates. However, when participants were asked to judge cartoons they had seen at an earlier point in time, they used the affect they were experiencing at the time of judgment as a standard of comparison in construing the implications of the feelings they had had to the cartoons they had seen earlier. Thus, they reported being relatively less amused when they were experiencing positive affect than when they were not.

A similar process might underlie the results obtained by Parrott and Sabini. That is, when people are asked to recall an experience they had in high school, the concept "high school" may spontaneously elicit affective reactions. These reactions are likely to be more negative, on average, than the feelings that happy individuals were experiencing at the time of judgments, and may consequently elicit thoughts that (e.g.), "I felt less happy in high school than I do now." Correspondingly, "high school" may elicit more positive feelings than unhappy persons are experiencing and may lead them to think that "I felt happier in high school than I do now." These

thoughts may then cue the recall of experiences that exemplify them, producing the mood-incongruent retrieval effect that Parrott and Sabini observed. When participants were explicitly told to get into a happy or sad mood, however, the semantic concepts activated by these instructions may have cued the retrieval of knowledge that exemplified them, and these effects may have offset the effects of thought processes that would otherwise have occurred. In any event, Parrott and Sabini's results strongly suggest that the recall of previously acquired knowledge is not cued by participants' affective reactions per se. Thus, they are quite consistent with Postulate 1.<sup>8</sup>

The assumption that affective reactions generally cue memories of events that elicited these reactions is also compromised by the apparent asymmetry of their effects. That is, happy moods facilitate the recall of happy events, but sad moods do not facilitate the recall of unhappy ones (Natale & Hantas, 1982; Salovey & Singer, 1985). This asymmetry might be attributed to motivational factors (Isen, 1984; Singer & Salovey, 1988). That is, happy persons may be motivated to recall happy events in order to maintain their mood, whereas unhappy individuals are motivated to avoid recalling unhappy events. This interpretation also argues against the assumption that the retrieval of affect-congruent concepts and knowledge is stimulated by affective reactions per se.

The research described above concerned the effect of experimentally-induced affect on information retrieval. Many other studies have looked at the impact of chronic affective states (e.g., depression) on memory (for a review, see Blaney, 1986). However, the results of this research are somewhat inconsistent, and their relevance to Postulate 1 is hard to evaluate. The difficulty is similar to that encountered in laboratory studies. For example, depressives and nondepressives are likely to differ not only in the affect they are experiencing but also in the semantic concepts and episodic knowledge that are chronically accessible in memory. Therefore, differences in recall could easily be due to the cueing properties of these cognitions rather than to affect per se.

Summary. The results reported by Parrott and Sabini (1990), and Bower et al.'s (1981)

failure to obtain post-information mood effects on information recall, directly contradict the proposition that affective reactions per se influence the retrieval of declarative knowledge from memory. Other studies have identified effects of mood-induction procedures on the interpretation, encoding and retrieval of information that is similar in valence to participants' moods but is not semantically related to affective states. However, Niedenthal and Setterlund's (1994) findings imply that these effects are probably due to factors other than affective reactions per se. In light of these considerations and the generally mixed empirical support for mood-congruent effects on retrieval (for reviews; see Blaney, 1986; Bower, 1991; Mayer, Gayle, Meehan, & Haarman, 1990; Riskind, 1989), it seems reasonable to consider Postulate 1 to be viable.

#### B. The Role of Affect in Activating Procedural Knowledge (Path 9)

Affective reactions are likely to play a more important role in the activation of procedural knowledge than in the accessibility of declarative knowledge. As we noted earlier, this knowledge can be conceptualized metaphorically as having the form of "IF [X], THEN [Y]" productions, where [Y] denotes a sequence of cognitive or motor acts and [X] denotes a configuration of internal stimulus features that, in combination, serve as a precondition for eliciting this sequence. The precondition could be a mixture of perceptual codings of external stimuli, internally-generated thoughts or concepts, and bodily sensations. When the conditions specified in the configuration are met, the sequence of activities associated with them is automatically initiated.

Some productions are situation- and response-specific (e.g. "IF a person returns a lost wallet and one's goal is to form an impression of this person, THEN interpret the behavior as honest"). Others are more general (Smith, 1990). For example, the kind of undifferentiated appraisal of a situation that Lazarus (1982) postulated might stimulate a general (non-situation-specific) response strategy. Procedures can be acquired in the course of deliberative goal-directed cognitive activity. Over time and repetition, however, they may be activated and performed with a minimum of conscious cognition mediation (Smith, 1990, 1994).

Affective reactions, like perceptions, thoughts and other internally generated stimuli, can be parts of a configuration of stimuli that in combination serve as a precondition for a production.<sup>9</sup> On the other hand, affective reactions are unlikely to be the only precondition. Cognitions about the specific situation at hand or task to be performed are also included. Without knowing the nature of these situation-specific cognitions, the role of affect in procedural knowledge can therefore be hard to predict. Nevertheless, the following postulate seems viable:

Postulate 2. The affective reactions that one experiences, along with concepts and cognitions that are activated by an appraisal of a stimulus situation, can compose a precondition for a previously-learned sequence of responses (i.e., a cognitive production).

This response sequence may be applied spontaneously, with little conscious cognitive mediation, under conditions in which the precondition is met.

Despite the vagueness of this postulate, some general predictions seem tenable. Bless et al. (1996) postulate that positive affect is associated with a disposition to use broad concepts and general knowledge structures to perform experimental tasks, whereas negative affect is associated with attention to situational details. They assume that these differences result from a previously-learned association of positive affect with conditions in which success has not required a careful scrutiny of the situation or task to be performed. In contrast, negative affect is often associated with failure and negative behavioral consequences that can only be avoided by attention to situational details (cf. Schwarz, 1990). To this extent, positive affect (along with other situation-related cognitions) may often be part of a learned precondition for the use of general (e.g., categorical) criteria in responding to an achievement task, whereas negative affect may be a precondition for a more detailed analysis of the task requirements and the information bearing on them. It seems reasonable to suppose that these alternative productions are elicited spontaneously when the preconditions for them are met and are performed with little if any conscious cognitive mediation.

Note that the different productions activated by positive and negative affect require the use of different types of knowledge. If the procedures activated by positive affect involve the use of

general concepts and knowledge, they may stimulate a search of memory for representations of this type. In contrast, the procedures activated by negative affect may require more specific concepts that can be used to interpret informational details. At least two studies provide evidence that this is so.

Bless et al. (1996) reasoned that if people who experience positive affect spontaneously activate general knowledge structures to use in processing information, they should be able to process this information more efficiently. Moreover, their use of these knowledge structures should free cognitive resources for use in other, unrelated cognitive activity. To evaluate this possibility, participants who were induced experimentally to feel happy or unhappy listened to two tape-recorded stories about daily life events (e.g., making a telephone call from a public phone booth) while they performed a clerical task. Both recognition memory for the events mentioned in the audio tapes and accuracy in performing the clerical task were recorded.

As expected, happy participants were more likely than unhappy ones to use a prototypic script (Schank & Abelson, 1977) to comprehend the taped information. That is, happy participants were more likely than unhappy ones to report prototype-consistent events as having been mentioned, but were less likely than unhappy participants to report atypical events. To the extent that participants apply a general prototype in comprehending the tape-recorded information, however, they should be able to devote more cognitive resources to the clerical task. This was also the case. Happy participants performed better on the secondary, clerical task than unhappy participants did.

A quite different study by Dienes (1996) has similar implications. In this study, happy and unhappy participants were asked to learn a list of words that exemplified either easily identifiable concepts (animals, countries, etc.) or obscure ones (e.g., things made of wood). Learning the list could be facilitated by attending to the details of the individual words, by mentally organizing the words in terms of the concepts they exemplified, or both. (For evidence that the organization of information items into categories improves learning, see Hunt & Einstein, 1981). The author reasoned that when the concepts exemplified by the stimulus words were obvious, both happy

and unhappy participants would spontaneously identify and use these concepts to organize the stimuli. When the concepts were more obscure, however, only happy participants should spontaneously identify them, so only these participants' learning of the stimulus words should be facilitated. Consistent with this reasoning, happy participants had better memory than unhappy participants for the hard-to-categorize words but not for the easy-to-categorize words.

The conclusion that persons who experience positive affect bring categorical and general knowledge structures to bear on tasks they perform does not imply that affective reactions per se cue the retrieval of these knowledge structures. Rather, this retrieval is mediated by the impact of affect on the activation of cognitive productions that require different types of declarative knowledge. Note that the activation of a production also depends on the presence of other, situational features that make up the precondition for eliciting it. The cognitive productions that are activated and applied in some situations do not always require the types of knowledge of concern in the studies by Dienes and Bless et al. In other cases, affective reactions might not be a feature of the preconditions that elicit goal-relevant productions and, therefore, might have no influence at all.

In this regard, Murray, Sujan, Hirt, and Sujan (1990) found that although happy participants used fewer categories to classify stimuli than control participants when they were told to focus on similarities, they used relatively more categories to classify the stimuli when they were told to focus on differences. These latter findings qualify the conclusion that happy persons typically use broader categories to classify stimuli than unhappy persons. Further experiments by Murray et al. indicated that differences in categorization observed in both task conditions were likely to result from a more general tendency for positive affect to increase the number of attribute dimensions that participants brought to bear on the particular task they were asked to perform. Thus, it increased their ability to make distinctions among the stimuli they were considering as well as to identify similarities. As Murray et al. suggest and we elaborate presently, these results could reflect mood-induced differences in the motivation to perform the task at hand rather than differences in the cognitive productions that participants spontaneously apply under the

conditions being investigated.

The cognitive procedures we have postulated in this section are presumably activated and applied spontaneously, without conscious deliberation. Other formulations (e.g., Isen & Shaker, 1982; Mackie & Worth, 1989) assume that affect influences the strategies that are employed through its mediating impact on the motivation or ability to engage in concentrated cognitive activity. These influences could also be reflected in Path 9, as described in Figure 1. However, the conceptualization we propose assumes that these influences are actually mediated by the impact of affect on response evaluation (Path 11). These alternative interpretations are evaluated in later sections of this chapter.

### C. Conclusions

The results summarized in this section are compatible with our contention that except under very restricted conditions (cf. Niedenthal et al., 1997), affective reactions per se do not influence either the retrieval of affect-congruent semantic concept and declarative knowledge (Path 7) or the selective attention to and interpretation of new information (Path 8). Affective reactions can nevertheless influence the accessibility and use of declarative knowledge indirectly through its mediating impact on the cognitive procedures that persons spontaneously activate and apply in the course of attaining a particular cognitive objective (Path 9). That is, these reactions in combination with features of the task to be performed can spontaneously activate a procedure that requires a certain type of declarative knowledge (Bless et al., 1996; Dienes, 1996). However, the procedure that is activated, and the type of knowledge it requires, is likely to depend on the type of task being performed and the situational conditions that surround it. Consequently, general conclusions concerning the influence of affective reactions on the accessibility of different types of knowledge should be treated with caution.

## V. THE USE OF AFFECT AS INFORMATION IN MAKING JUDGMENTS (PATH 10)

The outputs of information processing are often judgments. These judgments, which could either be reported overtly or remain covert, could concern oneself, another person, an event, the consequences of one's behavior, or an abstract concept. The affective reactions that are elicited

by a referent can sometimes be a basis for judging it. However, when and how this is done depends on the type of judgment to be made.

Earlier in this chapter, we distinguished between affect-based evaluations and descriptively-based evaluations. Whereas evaluations of the first type are based primarily on one's feelings toward the target being judged, evaluations of the second type are only based on affect when more directly relevant criteria are either unavailable or difficult to apply. This difference has sometimes been ignored in formulations of the role of affect in inference processes. Forgas (1992, 1995), for example, assumes that affect functions as a heuristic that is applied only when people are either unable or unmotivated to employ other, nonaffective criteria. Schwarz and Clore (1988) also refer to a "how-do-I-feel-about-it?" heuristic in conceptualizing the informational influence of affect. Although circumstances arise in which such a heuristic is applied, we believe that affective reactions are often the primary basis for many judgments and are not simply used when other criteria are unavailable.

People's use of their affective reactions as a basis for judgments is complicated by the fact that the feelings they experience at the time of judgment can be elicited by stimuli other than the ones they are judging. These feelings could result from judgment-irrelevant thoughts that occurred before the target stimulus was considered. Unfortunately, people cannot clearly distinguish between the affect that is elicited by one source and the affect that is elicited by another. Consequently, the affect they experience for reasons that have little to do with the object they are evaluating can often have an impact on the judgments they report.

When people's attention is called to the fact that the affect they are experiencing could be influenced by judgment-irrelevant factors, they may attempt to correct for this influence. As Schwarz (1990) points out, this correction can occur in two ways. In some cases, persons may simply discount their feelings and employ alternative criteria. When alternative criteria are unfavorable or difficult to apply, however, people may be forced to estimate the magnitude of the affect they are experiencing for judgment-irrelevant reasons and adjust their judgments to compensate for it. These estimates are not always accurate. If persons do not adjust enough,



extraneous sources of affect will continue to influence their judgments. If, on the other hand, they adjust too much, this extraneous affect will have a negative, contrast effect on their judgments. The conditions in which adjustments and discounting processes are most likely to occur are conveyed in the following two postulates.

Postulate 3. Persons use the affect they are experiencing to make judgments of their feelings about themselves, other persons, objects, or events, or to make other judgments for which these feelings are the primary criterion. If they perceive that the affect they are experiencing is due in part to judgment-irrelevant sources, they will adjust the judgments they report to compensate for the influence of this extraneous affect.

Postulate 4. People may use the affect they are experiencing as a heuristic basis for evaluative judgments that are not typically based on affective reactions when they are either unable or unmotivated to use other, more directly relevant criteria. This will not be true, however, if they perceive that the affect they are experiencing is due in part to judgment-irrelevant factors and if nonheuristic bases for judgment are available. Then, they will discount their affect entirely as a source of information and base their judgments on other, descriptive criteria.

Methodological considerations. The use of affect as an informational basis for judgments has typically been investigated using procedures originally employed by Clore and his colleagues (Clore & Byrne, 1974; Griffitt & Veitch, 1971; Gouaux, 1970) and refined by Schwarz and Clore (1983). Specifically, suppose that before people are asked to make a judgment to which affect is relevant, they are induced to feel either happy or unhappy for reasons that are unrelated to this judgment. Then, because they cannot easily segregate the affect from this extraneous source from the affect elicited by their thoughts about the object being judged, this irrelevant affect should have an impact on the judgment they make. On the other hand, suppose persons do not consider affect to be a basis for their judgment. Then, neither their affective reactions to the object they are judging nor the affect they are experiencing for other reasons should influence the judgments they make. In short, the extent to which extraneous sources of affect influence

judgments provides a basis for inferring whether affect in general is considered to be a relevant judgmental criterion.

### A. Affect-Relevant Judgments

The assumption that affective reactions provide the basis for judgments is hardly of recent vintage. Thurstone's (1959) attitude scaling procedures were intended to assess persons' affective reactions to a concept independently of the content of their beliefs about it. The assumption that persons base their liking for someone on their affective reactions to the individual also underlies Byrne's (1971; see also Clore & Byrne, 1974) similarity-attraction hypothesis. Despite several earlier attempts (e.g., Gouaux, 1971; Griffitt & Veitch, 1971), it remained for Schwarz and Clore (1983) to demonstrate convincingly that affect can have informational impact on judgments independently of the situational and informational conditions that produce it.

In these studies, persons who were experiencing positive or negative affect as a result of either an experimental manipulation (e.g., writing about a happy or sad event) or the weather were asked to judge their life satisfaction. Happy participants reported greater satisfaction than unhappy ones. However, when participants' attention was called to a judgment-irrelevant reason for the affect they were experiencing, this difference disappeared. Increasing participants' awareness of this alternative explanation for the affect they were experiencing would have had little effect unless they were otherwise disposed to use this affect as a basis for their judgments.

Further evidence that affective reactions are used as a basis for judgments to which they are relevant was obtained by Strack, Schwarz and Gschneidinger (1985). They found that when persons recalled pleasant and unpleasant past experiences in ways that did not elicit affective reactions, they used these experiences as standards of comparison in evaluating their present life satisfaction. Thus, they reported greater satisfaction after recalling an unpleasant experience than after recalling a pleasant one. However, when the experience that participants recalled elicited affect, it had a positive influence on their judgments similar to that observed by Schwarz and Clore (1983). In other words, the influence of the affect elicited by the experience offset the contrast effects that resulted from a consideration of its descriptive implications.

A particularly impressive demonstration of the influence of affect on judgments was performed by Strack et al. (1988) in an experiment described earlier. Briefly, participants were asked to estimate how amused they were by a number of cartoons while holding a felt-tip pen either between their teeth (a procedure that activated muscles involved in smiling) or between the lips (which activated muscles involved in frowning). This proprioceptive stimulation was expected to elicit positive or negative affective reactions, respectively (see Path 2, Figure 1). Although participants were totally unaware that their facial expressions were being manipulated, they reported being more amused by the cartoons in the first condition than the second. Supplementary data provided evidence that participants considered their affective reactions to be the primarily relevant basis for their judgments. If they were simply being used as a heuristic, these reactions should have influenced all evaluative judgments that participants were asked to make. In fact, facial feedback only influenced judgments of amusement (an estimate of positive feelings toward the cartoons) it did not influence judgments of how funny the cartoons were in general (estimates that may have been based in part on normative considerations). Therefore, the data argue against Forgas's (1992, 1995) assumption that the only direct influences of affect on judgments are heuristic.

### 1. Corrections for Bias in Making Affect-Based Judgments

Postulate 3 asserts that when affect is the primary basis for judgment, people make these corrections by first computing a judgment on the basis of the affect they are experiencing and then adjusting this estimate to compensate for the bias they perceive to exist. Schwarz and Clore (1983) provide evidence for these adjustment processes. In one experiment, affect was induced by having participants write about a happy or sad experience in a rather odd-looking sound-proof booth. Some participants were forewarned that the booth might make them feel rather depressed; others were told that it might make them feel somewhat elated, and others were given no information at all about the booth's effects. Later, participants reported their life satisfaction.

Participants who were given no information about the booth's effects reported less satisfaction with their life after writing about an unhappy experience than after writing about a

happy one. Moreover, telling unhappy participants that the booth might make them unhappy (thus producing an judgment-irrelevant explanation for their feelings) increased their ratings of life satisfaction to a level similar to that of happy participants, whereas telling them that the booth would make them elated decreased their estimates of life satisfaction even further. Thus, these participants not only based their judgments on the affect they were experiencing but adjusted for the impact of affect they considered to be irrelevant.

In contrast, happy participants judged themselves to be equally satisfied with their lives in all conditions, regardless of how the booth was characterized. The nonparallel effects of positive and negative affect could reflect a more general difference in the assumptions that people make about how much they need to correct for the bias produced by different types of affect (for evidence of differences in persons' implicit theories of correction in other judgments domains, see Petty & Wegener, 1993; Wegener & Petty, 1995, 1997). Although no evidence bears directly on this possibility, a study by Wyer and Budesheim (1987) is suggestive. They found that participants who thought they might be influenced by judgment-irrelevant information about a person adjusted their judgments to a lesser extent when the implications of the biasing information were favorable than when they were unfavorable. People apparently expect others to have favorable attributes and, therefore, perceive information that confirms these expectations to be less biasing. An analogous difference could exist in the situations considered by Schwarz and Clore. That is, suppose people normally expect to have positive feelings about a person they are judging (themselves or someone else). If this is so, they may perceive judgment-irrelevant positive affect to be less biasing than judgment-irrelevant negative affect, and may adjust their judgments less to compensate for it.

Findings reported by Gasper and Clore (1998) may qualify this conclusion, however. They found that chronically anxious persons do not adjust for the influence of transitory situational factors on the negative affect they are experiencing. Apparently, calling these individuals' attention to extraneous sources of negative affect makes salient to them that their feelings are not due to transitory factors alone. Consequently, it increases the influence of the negative affect

they are experiencing rather than decreasing it.

## 2. Effects of Motivation and Ability in Adjustment for Bias

Persons' adjustment for the biasing influence of extraneous affect may depend on not only their perceptions of how much adjustment is necessary, but also their ability and motivation to make this adjustment. In fact, an alternative explanation of Schwarz and Clore's findings is that persons are simply not motivated to adjust for biasing influences of information that has favorable implications for themselves. Support for this contention was obtained by Arkin, Gleason, and Johnston (1976). They found that although persons took responsibility for failure only if situational factors that could account for this outcome were unavailable, they took responsibility for success regardless of whether alternative explanations for the outcome were provided.

Adjustments for bias may also depend on the ability to estimate the amount of correction that is necessary. In a study by Albarracin and Wyer (1998), some participants were distracted as they read an article describing the consequences of instituting comprehensive examinations at their university. These participants could not accurately assess their cognitive reactions to the message content and, therefore, confused it with the feelings they were experiencing because of their mood. As a result, they reporting more favorable attitudes toward the position advocated when they were happy than when they were not. Nondistracted participants, on the other hand, were better able to assess the affective implications of the message content and, at the same time, to adjust (in fact, to overadjust) for the biasing influence of the message-irrelevant affect they were experiencing. These participants reported less favorable attitudes toward the position when they were happy than when they were not.

Further evidence of the effects of motivation and ability on adjustment processes was obtained by Isbell and her colleagues (Isbell & Wyer, 1998; Ottati & Isbell, 1996). In these studies, participants were asked to estimate their liking for a political candidate on the basis of his stands on a number of social issues. If participants had either little knowledge about politics or little motivation to make an accurate judgment, they evaluated the candidate more favorably

when they were happy than when they were not. However, if participants were high in political expertise or were motivated to be accurate, they reported less favorable evaluations of the candidate when they were happy. Thus, participants' motivation and ability to think carefully about the evaluative implications of the information they received stimulated them to correct for the influence of judgment-relevant affect. In doing so, however, they adjusted too much, producing a contrast effect of this affect on the evaluations they reported.

Further evidence indicated that these adjustments occurred "on line" as each piece of information was presented and evaluated rather than at the time participants reported their judgments. Thus, their effects persisted long after the mood-related affect that participants experienced at the time they received the information had dissipated. In fact, on-line influences of affective reactions may be more the rule than the exception. In responding to persuasive communications that contain several different arguments, recipients may construe their affective reactions to the implications of each argument separately at the time they are exposed to it, and the overall attitude they report may reflect a composite of these component reactions (Fishbein, 1963). Similarly, persons who make a purchasing decision may experience both positive and negative affective reactions to specific features of the product at the time they learn about them, and their final decision may reflect a composite of these reactions (Adaval, 1996). This possibility is considered in more detail presently.

Note that our conceptualization assumes that the use of affect as information and corrections for its influence are conscious processes. A contrary position has been taken by Winkielman et al. (1997) in a study described earlier (see also Zajonc, 1980). Briefly, Winkielman et al. showed that subliminally priming happy and angry faces influenced participants' evaluations of Chinese ideographs even though the participants did not report experiencing affective reactions at the time they made these evaluations. Moreover, making salient alternative explanations for the affect they were experiencing had no impact on the influence of the priming stimuli. Winkielman et al. concluded that participants were unconsciously using the affect elicited by the priming stimuli as a basis for their judgments of the

ideographs and thus were unable to correct for its influence. As we pointed out earlier, however, these findings could reflect a spontaneous categorization process of the sort we postulated to underlie the automatic evaluation effects identified by Bargh (1997), and might not have anything to do with the use of affect as per se as an informational basis for judgments.

#### B. Judgments to Which Affect is Not Directly Relevant

According to Postulate 4, affective reactions are most likely to be used to make descriptive judgments when either (a) relevant descriptive information is unavailable or difficult to retrieve from memory, or (b) the implications of this information are hard to compute. In such conditions, affect may provide a heuristic basis for judgment as postulated by Schwarz and Clore (1988). When more directly relevant judgmental criteria are easily accessible in memory, however, these processes may not occur.

Levine, Wyer and Schwarz (1994) obtained support for this possibility. In this study, some participants first wrote about either a happy or an unhappy achievement experience, whereas others wrote about either a happy or unhappy social experience. Then, all participants judged their competence in both the domain to which the recalled experience was relevant and the domain to which it was not. Participants were expected to base their judgments on the descriptive implications of a relevant past experience when such an experience came to mind easily, but to use their affect as a basis for judgment when such an experience was not immediately accessible.

Content analyses indicated that participants took personal responsibility for the achievement experiences they reported regardless of their favorableness. However, they attributed the social experiences they reported either to other persons or to external circumstances. Thus, the achievement experiences that participants recalled had descriptive implications for their achievement competence, whereas the social experience they recalled had little relevance to their social competence. Consistent with this finding, participants' judgments of their achievement competence were influenced by the achievement experience they recalled, but their estimates of social experience were not affected by the social experience they recalled. In contrast, both types

of recalled experience (or, more accurately, the affect elicited by them) influenced participants' judgments of their competence in the domain to which their recalled experience did not pertain. In other words, participants based their competence judgments on the descriptive implications of a judgment-relevant past experience when such an experience had been made salient to them as a result of the story they wrote. When a relevant past experience did not immediately come to mind, however, they based their judgments on the affect they experienced as a result of writing a judgment-irrelevant story, independently of the story's descriptive implications.

Other studies indicate that when people can easily recall information that has direct implications for their judgments, affective reactions that are only indirectly relevant to these judgments have little effect. Schwarz, Strack, Kommer, and Wagner (1987), for example, found that although participants' affective reactions to a clean or dirty experimental laboratory room influenced their estimates of general life satisfaction, these reactions did not affect their evaluation of their personal living quarters. In the latter case, participants used the experimental room as a comparative standard in judging their place of residence independently of the affect it elicited. Thus, these latter judgments were apparently based on descriptive criteria rather than affect.

The use of affect as a heuristic basis for judgment could underlie the effects of wishful thinking (McGuire, 1960; see also McGuire & McGuire, 1991). That is, people believe that things they like are going to occur and that things they dislike are improbable. Consistent with this tendency, Albarracin and Wyer (1998) found that when persons were distracted from thinking about the implications of a behavior-relevant persuasive message, the message-irrelevant affect they were experiencing influenced both their attitudes toward the behavior and their beliefs that the behavior would have desirable consequences. When participants could carefully evaluate the content of the message, however, they based their beliefs in the behavior's consequences on descriptive implications of its content, and the affect they were experiencing had less influence. Thus, as in the studies by Schwarz, Levine and others, participants were inclined to use judgment-irrelevant affect as a basis for beliefs only when the implications of the



descriptively-relevant information are inadequate.

In summary, people appear to use their affective reactions as a basis for judgments in a wide variety of situations. This could occur not only when people are explicitly requested to make judgments but also spontaneously, when they make a decision that requires an assessment of their feelings toward a behavior or an object toward which the behavior is directed. To this extent, affect can influence performance on achievement tasks that require an evaluation of task-related activity or its consequences. We elaborate this possibility presently.

#### IV. EFFECTS OF AFFECT ON MOTIVATION AND ABILITY (PATH 9)

The cognitive procedures that are elicited by positive and negative affect are theoretically activated and applied automatically (Postulate 2). In contrast, other theories implicitly or explicitly assume that the impact of affect on the use of different information-processing strategies is more deliberative, and is mediated by its influence on people's ability or motivation to think carefully about the information they receive. These theories purport to explain the tendency for people to process information less extensively when they are happy when they are not. As we will indicate, there is some question regarding the generalizeability of this tendency and, in fact, whether it even exists. Before discussing the implications of our own conceptualization, alternative theories and the evidence bearing on them are worth reviewing briefly.

##### A. Theoretical Perspectives

The influence of affect on cognitive capacity. Mackie and Worth (1989; see also Isen, 1987; Worth & Mackie, 1987) postulate that positive affect is associated in memory with a large amount of previously acquired knowledge and that it activates this knowledge spontaneously whenever it is experienced. Once activated, the knowledge takes up capacity and, therefore, decreases the cognitive resources favorable for other, goal-directed information processing. As a result, the ability to evaluate the implications of new information is diminished. In support of this contention, Mackie and Worth found evidence that when the opportunity to think about a persuasive message was limited, happy participants were less influenced by the strength of

arguments contained in the message than others were. When participants were given as much time as they wanted to think about the message, however, this difference was eliminated.

The impact of affect on motivation. The affect that people experience could also influence their motivation to think extensively about the information they receive. Isen and Shalke (1982), for example, assumed that because persons who feel happy are motivated to maintain these pleasant feelings, they avoid engaging in demanding cognitive activity that is likely to bring them down. In contrast, unhappy persons are motivated to get rid of their unpleasant feelings (Isen, 1984). Consequently, they often try to distract themselves from thinking about the events that caused their unhappiness. For example, they might watch a movie, engage in physical exercise or, in a laboratory experiment, concentrate more fully on the tasks they are asked to perform. In combination, these considerations also imply that people are less inclined to evaluate carefully the implications of information they receive when they are happy than when they are unhappy. This should be particularly true when they expect the cognitive activity required to process the information to be aversive.

If this reasoning is correct, these processing differences should be eliminated or even reversed by leading happy persons to believe that thinking about the information they receive will be enjoyable and, therefore, will maintain or enhance their positive mood state. Wegener, Petty, and Smith (1995) showed that this was indeed the case. Participants listened to one of two communications. One message advocated a position with which participants were inclined to disagree, and was introduced with instructions that it was likely to make them unhappy. The content of this message had less impact on participants' attitudes when they were happy than when they were not. The other communication advocated a position that participants typically favored, and was introduced with a comment that reading it was likely to be enjoyable. In this case, the message content had greater influence on participants' attitudes when they were happy.

Wegener et al.'s (1996) results therefore qualify the conclusion that persons who experience positive affect are generally unmotivated to engage in extensive cognitive processing. There are also qualifications on the assumption that people who experience negative affect are motivated to

process new information extensively. For one thing, the distraction provided by this cognitive activity may only help to eliminate negative affect if the affect is mild and if nothing can be done about the events that produced it. Extremely unhappy individuals are likely to ruminate about the events that created their unhappiness instead of distracting themselves by engaging in irrelevant activity (Ellis & Ashbrook, 1988; Klinger, 1975; Martin & Tesser, 1996). To this extent, they may be just as insensitive to details of the affect-irrelevant information they receive as happy persons are.

Motivational consequences of using affect as information. A somewhat different conceptualization of the impact of affect on information processing was proposed by Schwarz and his colleagues (Schwarz, 1990; Schwarz & Bless, 1991; Schwarz, Bless, & Bohner, 1991). They note that the experience of positive affect is typically associated with pleasant life events and success in goal-directed activity, whereas the experience of negative affect often accompanies unpleasant events and failures. As a result of these past associations, people often interpret the positive affect they experience in a new situation as an indication that the situation does not require careful scrutiny, but interpret the negative affect they experience as a sign that the situation is potentially problematic and requires attention. Consequently, they may engage in less extensive processing of situation-relevant information in the first case than in the second. This hypothesis, therefore, provides yet another explanation of the people's tendency to be less sensitive to the strength of arguments conveyed in a persuasive communication when they are happy than when they are not.

### B. Empirical Ambiguities

In principle, the factors postulated by the three theories outlined above could contribute independently to the overall influence of affect on information processing. Nevertheless, some evidence appears to contradict the assumption that underlie each of the formulations. Particularly questionable is the hypothesis that affect influences cognitive capacity. For one thing, this hypothesis assumes that affect influences the accessibility of a diverse amount of declarative knowledge. This assumption appears to be invalid for reasons identified by

Niedenthal and Setterlund (1994) and noted earlier. The hypothesis is also incompatible with evidence that persons who are asked to perform two tasks simultaneously often do better on these tasks if they are happy than if they are unhappy (Bless, et. al. 1996); this would not be true if happy individuals' cognitive resources were limited. Wegner et al.'s (1996) finding that happy persons are more sensitive to the content of a persuasive message when they expect it to be enjoyable is also problematic for this hypothesis. Finally, cognitive theory and research raises more general questions concerning the validity of the assumption that processing differences of the sort that Mackie and Worth consider reflect differences in the cognitive resources that participants have available (for a review, see Logan, 1997).

On the other hand, evidence that affect influences the motivation to evaluate details on the information presented is also questionable. In the aforementioned study by Bless et al. (1990), happy participants' attitudes were less affected than sad participants' attitudes by the strength of arguments contained in a persuasive message. However, thought-listing data indicated that happy and unhappy participants did not differ in the total number of message-related thoughts they generated in response to the message. Rather, they only differed in the type of thoughts they reported; sad participants elaborated the positive implications of strong arguments, whereas happy participants attempted to refute their validity. Thus, both groups of participants were equally motivated to think about the message content but differed in how they thought about it. Two studies of impression formation by Isbell, Clore and Wyer (1998), described later in this chapter, have similar implications.

### C. Summary

The fact that affective reactions influence the impact of information on judgments and decisions is well established. However, general differences in either the capacity or the motivation to engage in analytic information processing cannot explain why and when the influence occurs. A somewhat different version of the affect-as-information hypothesis proposed by Schwarz and Clore (1983, 1988) provides a viable account of the effects of affective reactions on goal-directed information processing and has additional implications as well. This

application is discussed in the next section.

## VII. THE INFLUENCE OF AFFECT ON RESPONSE EVALUATION (PATH 11):

### A PERFORMANCE-FEEDBACK MODEL OF AFFECT AS INFORMATION

According to the feedback conceptualization of goal-directed information processing we propose (see Figure 1), people spontaneously monitor their behavior and the outputs it generates, to determine if they have attained the goal they are pursuing, or, if not, whether the strategy they are using to pursue the goal is appropriate. If they deem the results of their activity to be sufficient, they terminate their goal-directed activity. Otherwise, they continue processing, using the same or a different strategy, until they generate an output that they consider to be satisfactory.

When objective criteria exist for deciding whether a goal has been attained, the decision to engage in goal-directed activity is obviously based on these criteria. More often than not, however, the criteria for goal attainment are ambiguous. A woman who is writing a term paper, for example, is likely to have little objective basis for deciding whether the amount and quality of her output is sufficient. Therefore, her decision to stop or continue writing may be based in part on how she feels about the work she has done at the time these feelings are assessed. Similarly, people's decisions to continue using a given strategy or to try a different approach could also be based on their feelings about the adequacy of their initial attack on the problem at hand.

There is an important contingency in the validity of this hypothesis, however. That is, people sometimes engage in behavior because it is intrinsically enjoyable, independently of its instrumentality in attaining an external goal. In this case, the affect they are experiencing may have different implications than those described above. If the goal of the student in our earlier example is to write a paper of high quality, she may implicitly ask herself at some point if she feels it has met this criterion. Then, she is more likely to answer her self-generated question affirmatively, and therefore to stop writing sooner, if she is experiencing positive affect than if she is not. However, suppose she focuses her attention on whether she is having fun working on the paper rather than the quality of her output, and asks herself if she feels that this is the case. Then, she may be more inclined to answer her question affirmatively, and continue writing

longer, if she is experiencing positive affect than if she is not.

These examples suggest the possibility that people use the affect they are experiencing at the time they are engaging in goal-directed activity as information in evaluating the effectiveness of their goal-directed activity. This evaluation can bear on two aspects of this activity. First, it can concern whether the outputs that have been generated up to that time are sufficient for attaining the goal. Second, it could concern whether the strategy being used to generate outputs is likely to be effective in attaining their objective or whether an alternative strategy should be adopted. The way in which affect is brought to bear on these concerns depends on the nature of the goal being pursued and the type of activities that are involved in its pursuit.

Certain of these contingencies were first identified by Martin, Achee, Ward, and Wyer (1993). However, Martin et al. focused on only the use of affect as a basis for deciding whether to continue engaging in goal-directed activity or to terminate it. Our conceptualization also takes into account its use as information about the appropriateness of the strategy one has chosen to attain a particular objective. As a result, it has additional implications that are not addressed by the original theory.

The present formulation is embodied in two postulates:

Postulate 5. When people engage in behavior for the purpose of attaining an external goal and objective criteria for inferring the attainment of this goal do not exist, they use the affect they are experiencing to infer whether they feel that the strategy that have used in pursuit of this goal, and the outputs they have generated by employing it, are appropriate. Therefore, they are more likely to infer that they have met the criterion for satisfactory performance if they are experiencing positive affect than if they are not.

Postulate 6. When people's primary reason for engaging in behavior is enjoyment, they use the affect they are experiencing as a basis for inferring this enjoyment. Therefore, they will continue the activity longer if they are experiencing positive affect than if they are not.

In combination, Postulates 5 and 6 suggest that the affect persons experience will have

different influences on their decision to continue performing an activity in which they are engaged, depending on whether their motivation for engaging in the activity is extrinsic or intrinsic. Two studies by Martin et al. (1993) demonstrated these differences empirically. In one study, happy or sad participants were asked to form an impression of someone on the basis of a series of behaviors. Each behavior was printed on a separate card of a deck that participants were given. Participants under performance-criterion conditions were told to continue turning the cards and reading the behaviors until they had enough information to form an impression. In contrast, participants under enjoyment-criterion conditions were told to continue as long as they were enjoying what they were doing. The first group of participants should implicitly ask themselves as they read the behaviors if they feel they have enough information. Therefore, they should be more likely to answer this question affirmatively, and to stop reading sooner, if they are happy than if they are sad. The second group of participants, however, should ask themselves if they are enjoying the task, again responding more affirmatively if they are happy than if they are sad. In this case, therefore, happy participants should continue reading behaviors longer than sad participants. Results confirmed these predictions. That is, happy participants read fewer behaviors than sad participants in the first condition, but more behaviors than sad participants in the second.

A second study replicated these findings using a different task. In this case, participants were asked to generate a list of birds. Some participants were told to continue until they thought it was a good time to stop, whereas others were told to continue as long as they were enjoying themselves. Happy participants persevered less long on the task than unhappy participants when they were told to use a performance criterion, but longer than unhappy participants when they were encouraged to employ an enjoyment criterion.

In Martin et al.'s studies, the criterion for stopping or continuing was explicitly imposed by the experimenter. When the criterion is more implicit, the relative emphasis on performance and enjoyment is likely to vary with the nature of the task and the context in which it is performed. In laboratory studies, participants are often given a particular task objective by the experimenter.

Under these conditions, participants may spontaneously employ a performance criterion. That is, they may base their decision to persevere on whether they feel that their responses fulfill these extremely imposed task requirements. This hypothesis was supported in a third condition of Martin et al.'s second experiment in which participants were simply told to stop generating birds when "they wanted to." The results in this condition were very similar to those obtained when participants were given an explicit performance criterion; that is, happy participants stopped sooner than unhappy ones. These results confirm the speculation that participants in many experimental situations spontaneously focus their attention on whether they have fulfilled the implicit task objectives they are given. Nevertheless, when an experimental task is particularly interesting, or when achievement goals are deemphasized, an enjoyment criterion might be applied as well.

Some evidence in support of the latter possibility was reported by Murray et al. (1990) in a study mentioned earlier in this article. Some participants were asked to list similarities between two popular television programs, whereas others were asked to list differences between the programs. The task was intrinsically interesting to college-age participants and, therefore, was likely to stimulate them to use an enjoyment criterion in deciding how much effort they should expend. To this extent, participants should use the affect they were experiencing as a basis for inferring their enjoyment. Consistent with this assumption, happy participants reported enjoying the task more than control participants did. Correspondingly, happy participants listed more similarities between the television programs when they were asked to focus on similarities, and listed more differences between the programs when they were focussed on differences, than control participants did. Note that these results would be hard to explain on the basis on either the assumption that positive affect generally increases the accessibility of global concepts in memory or the assumption that positive affect reduces cognitive resources. It seems more reasonable to support that happy participants inferred from the affect they were experiencing that they were enjoying the task, and therefore devoted more effort to an identification of both similarities and differences in the stimuli they were judging than other participants did.



Murray et al.'s finding that happy participants reported greater enjoyment of the task than other participants raises an additional consideration. That is, when several goals are available in a situation, the affect that persons happen to be experiencing could influence the goal they choose to pursue as well as their inference that they have or have not attained it (for a discussion of this possibility, see Schwarz & Clore, 1996). For example, happy individuals may often be more likely to adopt an enjoyment objective than unhappy individuals (Isen, 1987). If this is so, happy persons may persist on a task because they infer that they are enjoying it, whereas unhappy persons, who adopt a performance criterion, may persist because they feel that they have not yet attained an adequate level of achievement. To this extent, both happy and unhappy persons might persist to an equal extent, albeit for different reasons.

Despite this ambiguity, the influence of affect on behavior in a large number of situations both in and outside the laboratory can be conceptualized in terms of its mediating influence on the answers to questions that persons implicitly ask themselves about their behavior and its outcomes. Moreover, this conceptualization calls attention to several contingencies in the impact of affect that have not been investigated in the research performed to date. Several areas of research are worth reviewing from this perspective.

#### A. Creativity

A creativity task that is often employed in the laboratory requires participants to generate instances of a concept. This task is similar to that constructed by Martin et al. (1993, Experiment 2) except that the concept involved has unclear boundaries, thus allowing participants to generate novel responses. Thus, for example, participants might be asked to generate uses of a brick or things they could use to sit on. In this situation, like that constructed by Martin et al., participants might assume they should stop when they have generated enough good responses to fulfill the demands of the task. However, the task itself might often be intrinsically enjoyable, as it requires a degree of imaginativeness. Thus, many participants might spontaneously apply an enjoyment criterion as well. Consistent with this speculation, Isen and Daubman (1984) found that happy participants generated more responses when performing such a task than control

participants did. This suggests that an enjoyment criterion predominated.

A somewhat different interpretation of these results, however, is suggested by the fact that happy participants also tend to generate more novel responses than other participants. When the criterion for an appropriate response is unclear, participants may inhibit reporting responses that they feel are poor exemplars of the concept they are considering. Specifically, they may subjectively generate a response (e.g., a potential use for a brick), ask themselves if they feel their response is a good one, and only report it if they answer this question affirmatively. Thus, they are more likely to write down their response on the list they are compiling for the experimenter if they are happy than if they are not. The tendency for happy persons to perform better than other persons on the Remote Associates Test (Isen, Daubman, & Nowicki, 1987) could also be consistent with this interpretation. Finally, the interpretation might also explain the difference between the influence of affect on responses in Isen and Daubman's (1984) study and its effects in control conditions of Martin et al.'s (1993) experiment. That is, the criterion for membership in the category that participants considered in Martin et al.'s experiment (birds) was clearly defined, and so the use of affect to evaluate the appropriateness of individual exemplars was less likely.

Individual differences may exist in the relative emphasis that is placed on performance objectives and enjoyment objectives. Persons with high need for cognition (Cacioppo & Petty, 1982), for example, typically find intellectual activity to be intrinsically enjoyable. They may therefore be likely to adopt an enjoyment criterion, whereas persons with low need for cognition may be guided to a greater extent by performance criteria. If this is so, the experience of positive affect might increase the persistence of high need-for-cognition individuals on response-generation tasks, but might decrease the persistence of low need-for-cognition individuals on such tasks. In fact, data obtained by Martin et al. (1993) confirm this prediction.

### B. Impression Formation

In impression formation research (for a review, see Wyer & Carlston, 1994), participants typically receive information about several behaviors a person has performed with instructions to

form an impression of the person. A large amount of information is typically presented (e.g., 25-30 items; see Wyer & Martin, 1986), and so it is difficult to form an impression that takes all of it into account. Consequently, participants in these experiments may often ask themselves at various points if the information they have received is a sufficient basis for a concept of what the individual is like. If they answer this self-generated question affirmatively, they may base their concept of the person on this information without taking into account the implications of the information they receive later. If this is so, and if happy participants are more likely than unhappy participants to respond affirmatively to such a question, they should use relatively less information to form their impressions. Moreover, the information they use should typically occur at the beginning of the sequence rather than at the end.

Martin et al.'s (1993, Experiment 1) results confirm the assumption that participants with an impression formation objective use less information to form an impression than sad participants do. The prediction that happy persons are more likely than unhappy ones to base their impression on the first information they receive was confirmed in research by Isbell et al. (1998) mentioned earlier. Participants who were feeling either happy or sad were asked to form an impression of someone who was described at the outset as either extraverted or introverted. This general description was followed by a series of behaviors, an equal number of which exemplified each of these traits. After receiving the information, participants judged the target's extraversion and then recalled the behaviors they had received.

We expected that the general description of the target that participants received at the outset would activate a concept of either an extravert or an introvert, and that participants would implicitly ask themselves if they felt that this concept was an appropriate basis for their impression. Happy participants, who should answer this question affirmatively, should be more inclined than unhappy participants to apply the concept to the target and to base the judgments they report later on this concept. This was in fact the case, as indicated earlier. That is, the initial target description had a substantial effect on happy participants' judgments of the target's extraversion but had very little impact on unhappy participants' judgments.

The fact that happy participants used the concept activated by the initial description of the target as a basis for their judgments does not mean that they failed to think about the behavioral information they received later. To the contrary, persons who apply this concept to the target should think about the behavioral information they receive with reference to it (Srull & Wyer, 1989). Moreover, they should think more extensively about behaviors that are inconsistent with the concept in order to reconcile their occurrence (Hastie, 19984; Srull & Wyer, 1989; Wyer & Srull, 1989). As implied by this reasoning, these participants recalled more inconsistent behaviors than consistent ones. Unhappy participants, who did not apply the concept activated by the initial trait description to the target, did not engage in this inconsistency resolution. Consequently, they recalled behaviors that were consistent and inconsistent with this description equally well.

The phenomena identified by Isbell et al. are not restricted to laboratory situations in which affect is induced experimentally. In a study conducted over the telephone, participants' self-reported feelings of happiness were used to infer their affective state. The impact of affect on judgments observed in this study, shown in Figure 3a, was identical to that observed in the first experiment. In additional conditions of this study, however, participants before engaging in the impression formation task were asked to report the possible reasons for their mood, thus calling their attention to the actual source of the feelings they were experiencing. In these conditions, participants appeared to reject the implications of their feelings when deciding whether the initial target description was a sufficient basis for their impressions. Consequently, as shown in Figure 3b, impact of participants' affective state on their use of the initial target description was exactly the opposite of that observed when the true source of their feelings was not salient to them. That is, the initial target description had a substantial effect on unhappy participants' judgments, whereas its influence on happy participants' judgments was negligible.

More general implications of our conceptualization should be noted. In many cases, the initial impressions that people form of someone are based largely on their feelings toward the person. In these cases, the affect they experience at the time they judge the person could

potentially have a dual function. First, it may convey judgment-relevant information about the individual being judged (Schwarz & Clore, 1983). Second, it could be used as an indication of whether this affect is a sufficient basis for making the judgment. Thus, people who experience positive affect at the time they are asked to judge someone might not only infer that they feel favorably toward the target, but also that these feelings are a sufficient basis for the judgment they are asked to make. In contrast, people who experience negative affect may infer that they feel negatively toward the target but also may conclude that these feelings are not a sufficient basis for the judgment. This implies that the effects of positive affect on impression judgments may often be greater than the effects of negative affect. Our previous speculation, that people are generally less likely to correct for the biasing influence of positive affect than for the biasing influence of negative affect (cf. Schwarz & Clore, 1983), is consistent with this analysis.

### C. Stereotyping

Our interpretation of Isbell et al.'s findings also has implications for the effects of affect on the use of stereotypes. In a study by Bodenhausen (1993; Bodenhausen, et al., 1994), for example, happy and sad participants were asked to judge the culpability of a defendant on the basis of information about the defendant's background and the conditions surrounding the crime. The description of the crime was preceded by the target's name and home town, which either identified him as Hispanic or provided no clue as to his ethnicity. It seems reasonable to suppose that the defendant's ethnicity spontaneously activated a stereotype, and that participants implicitly asked themselves if they felt this was an appropriate basis for their judgment, answering affirmatively if they were happy and negatively if they were sad. Consistent with this reasoning, the stereotype had more impact on happy participants' judgments than on unhappy participants'. Note that if the stereotype had not been activated until after the detailed crime-related information was presented, participants would not be in a position to ask themselves at the outset whether the stereotype was a sufficient basis for judgment. If anything, they should ask themselves if they felt the crime-related information was sufficient. To this latter extent, happy participants in this condition might be more influenced by the crime-related information, and less

influenced by the stereotype, than sad participants are. As far as we know, this possibility has not been examined.

#### D. Communication and Persuasion

People who receive a communication that advocates a certain position are likely to have two goals in mind. One is to decide if the position being advocated is valid. A second objective, which is often not incompatible with the first, is simply enjoyment. Individuals with the first objective are likely to form an initial impression of the likelihood that the position advocated is valid before evaluating carefully the communication's contents. This impression could be based on the source of the message, on surface features of the communication itself (e.g., writing style), or on a previously formed attitude toward the position in question. When these a priori criteria do not exist, people may tentatively accept the position advocated as correct, and only later may attempt to discredit it. In this regard, Gilbert (1991) reported evidence that persons must tentatively accept an assertion as true in order to comprehend it, and that a later stage of processing is required to refute its validity. In the present context, this suggests that people are initially disposed to accept the arguments contained in a message as true, and that additional processing must be performed in order to refute them.

According to the present conceptualization, persons who make an initial appraisal of a message ask themselves if this appraisal is an appropriate basis for accepting the position advocated, and are more inclined to answer this question affirmatively if they are happy than if they are sad. This has two implications. First, happy persons are more likely than unhappy persons to rely on the source of a message as a basis for accepting the position advocated. Second, happy persons are less inclined than sad persons to make a careful evaluation of the arguments contained in a message. Consequently, their acceptance of the position advocated is less likely to be influenced by the quality of these arguments. Support for the first hypothesis has been obtained by Roselli (1995), and the second hypothesis is consistent with results of several studies described earlier (Bless, et al., 1993; Mackie & Worth, 1989).

The conclusion that happy participants with a performance objective are less likely than

unhappy participants to be influenced by the quality of arguments contained in a message might be conceptualized in terms of Petty and Cacioppo's (1986) elaboration-likelihood model. That is, happy participants appear more inclined to engage in peripheral processing whereas unhappy persons are more disposed to engage in central processing. However, the fact that happy participants' attitudes do not depend on the strength of arguments presented in the message does not imply that they ignore these arguments. Rather, they may evaluate them in terms of a position they have adopted on the basis of other criteria.

Bless et al.'s (1990) study bears directly on this possibility. Happy and sad participants received a communication advocating a fee increase at their university. All participants may have spontaneously formed an initial impression of the policy's desirability based on message unrelated criteria that came to mind at the time (e.g., the money they would have to pay). Happy participants, however, may have decided that this impression was a sufficient basis for opposing the policy and, having adopted this attitude, thought more extensively about aspects of the message that called its validity into question. Therefore, as Bless et al. found, they counterargued the arguments contained in the message regardless of whether they were weak or strong, and the attitudes they reported did not depend on the cogency of these arguments. In contrast, unhappy participants may have considered their initial impression to be an insufficient basis for their attitude. Therefore, they evaluated the message content more dispassionately, elaborating the position implications of strong arguments but counterarguing weak ones, and basing their attitudes on the results of this cognitive activity. Bless et al.'s findings confirm this interpretation as well. Thus, both happy and unhappy participants engaged in similar amounts of cognitive activity, but the nature of this activity differed. To this extent, these results confirm implications of Isbell et al.'s (1998) study in a different domain.

Two contingencies on this analysis are suggested by our conceptualization. First, the different cognitive activities performed by happy and unhappy persons should only occur if these persons perceive their feelings to have implications for the sufficiency of their initial impression as a basis for their attitude. If participants attribute their feelings to other, attitude-irrelevant

factors, the difference in processing should theoretically not occur. Results reported by Sinclair, Mark, and Clore (1994) confirm this prediction. They found that the effect of argument strength on participants' acceptance of a persuasive message was less on sunny days (when participants were happy) than on rainy days (when they were unhappy). However, calling participants' attention to the weather, thereby making salient the true source of their feelings, eliminated this difference.

Second, our analysis of Bless et al.'s (1990) study assumes that recipients' objective at the time they read the message is to evaluate the validity of the position being advocated. In contrast, suppose persons have an enjoyment objective. Then, precisely the opposite influence of affect might occur. The aforementioned study by Wegener et al. (1995), suggesting that happy persons are more influenced by the quality of arguments in a message than other participants when they are led to believe that the message will be enjoyable, confirms this implication of the performance-feedback conceptualization we propose.

#### E. Accuracy

The conceptualization we have outlined could apply to judgments of physical stimuli as well as social ones. People who are called upon to judge a stimulus may spontaneously make a holistic appraisal of the stimulus at the time they are first exposed to it before they scrutinize its individual features. They may then ask themselves if this appraisal provides a sufficient basis for judgments. To this extent, happy individuals should be more likely than unhappy ones to base their judgments on this initial appraisal alone. One implication of this is that when accurate judgments are likely to require a careful analysis of the individual stimulus features happy participants are less likely to be accurate than unhappy ones. Evidence reported by Sinclair and Mark (1992), showing that happy participants were less accurate than sad participants in estimating the correlation between two variables on the basis of scatter plots, confirms this speculation.

#### F. Behavior in Nonlaboratory Situations

Many situations arise outside the laboratory in which persons' behavioral decisions are



likely to be mediated by their feelings about the behavior and its implications. Students who prepare for an exam must decide if they have studied long enough. A person who wants to ask someone for a date must decide if it is the right time to do so. Or, a person who wishes to buy a car must decide if he or she has enough information about it to make a decision. In such instances, people should stop studying earlier, ask persons for a date sooner, and make a purchasing decision more quickly, if they feel happy than if they do not.

For similar reasons, happy persons may be more inclined to behave impulsively, or in ways that upon reflection they might consider undesirable. A series of studies by Forgas (1998) are interesting to consider in this context. In three studies, participants were asked to indicate how they would phrase a verbal request in a hypothetical social interaction. It seems reasonable to suppose that people who want another person to do something (e.g., to repay a loan) will spontaneously generate a verbal phrasing of the request that corresponds directly to the desired action (e.g., "Give me the money you owe me" and may implicitly ask themselves if it is appropriate to express the request in these terms. Only if they answer this question negatively may they alter the phrasing in a way that corresponds to normative standards of politeness. If this is so, the performance-feedback conceptualization we propose suggest that happy persons are more likely to express their requests impolitely than unhappy persons are. This, in fact, is what Forgas found. Although these studies were performed in the laboratory, they seem likely to generate to other situations as well.

However, the conclusion that persons are generally less likely than unhappy persons to engage in extensive information processing in situations outside the laboratory is somewhat questionable. These differences theoretically exist only when individuals have an implicit performance goal and base their decisions to process information on whether they feel they have attained this goal. In nonlaboratory situations, information processing is often performed for enjoyment and not for the purpose of attaining an external objective. In these circumstances, the performance-feedback conceptualization suggested by Martin et al. (1993) and elaborated here implies that persons who experience positive affect are likely to persevere longer, and to process

information more analytically, than persons who experience negative affect. For example, happy individuals may work harder on crossword puzzles, and may read news articles in greater depth, than sad individuals do. Moreover, they might make less premature decisions about other persons on the basis of the information they receive about them, in contrast to results observed in the laboratory (Isbell et al., 1998). The possibilities, which are not implied by other conceptualizations of the influence of affect on performance, should be kept in mind when drawing conclusions on the basis of experimental research in which performance objectives are implicitly emphasized.

#### G. A Final Comment

It is important to bear in mind that predictions on the basis of the performance-feedback model we propose require a priori knowledge of the goal that persons are pursuing and the alternative processing strategies they are likely to employ. In many instances, these criteria and strategies are self evident. In other cases, however, they are less clear. Moreover, as Schwarz and Clore (1996) point out, the affect that persons experience may have an impact on the goal that persons pursue as well as their strategy for attaining it. Nevertheless, the performance-feedback model potentially accounts for a wide range of phenomena and makes predictions that other conceptualizations cannot. Its implications are therefore worth further consideration.

### VIII. MULTIPLE INFLUENCES OF AFFECT ON JUDGMENT

#### A. Theoretical Considerations

As we noted earlier, few attempts have been made to circumscribe either theoretically or empirically the conditions in which each of the various influences of affect on information processing is likely to predominate. The only previous conceptualization of the role of affect in cognitive processing that speaks directly to this matter was proposed by Forgas (1992, 1994, 1995). He identifies four different strategies that people could use to judge a target stimulus. In two of these strategies, affect comes into the picture, but in different ways. One, heuristic-processing strategy is used when individuals are unmotivated to think extensively about the judgment to be made but a previously-formed judgment of the target is unavailable. In this case,

judges theoretically use their affective reactions as a heuristic basis for judgment without considering other judgment-relevant knowledge they may have. The second, substantive-processing strategy is employed when judges are motivated to make an accurate judgment and, to do so, they must select and interpret new information about the target in relation to their prior knowledge. In this case, affect is postulated to influence judgments through its moderating impact on the concepts and knowledge that persons retrieve and use to interpret the new judgment-relevant information.

The present conceptualization therefore differs from Forgas's in two important respects. First, although we postulate that persons sometimes use affect as a heuristic basis for judgment (Postulate 4), we also assume that it can be the primary basis for certain types of judgments (Postulate 3). Second, in contrast to the implications of a substantive-processing strategy, we argue that affective reactions per se do not influence the retrieval of previously acquired knowledge. Support for our claims has already been reviewed and need not be reiterated. However, two sets of findings are worth reiterating briefly in this context.

1. Schwarz and Clore (1983) found that persons reported greater life satisfaction on sunny days than on rainy ones. This was presumably because they felt relatively happier on sunny days, and used these feelings as a basis for their judgments. Personally relevant judgments might be expected on a priori grounds to stimulate substantive processing. Thus, they should be based on the retrieval of mood-congruent knowledge. However, Parrott and Sabini (1988) found that persons were more likely to recall unhappy life experiences on sunny days than on rainy ones. Why persons recall mood-incongruent self-relevant knowledge under the same conditions in which they make mood-congruent self-judgments is hard to explain in terms of Forgas's theory.

2. Perhaps the most compelling evidence obtained in support of Forgas's conceptualization was reported by Petty, Schumann, Richman, and Strathman (1983). They found that participants reported generally more favorable attitudes toward the position advocated in a message when they were happy than when they were not. However, the cognitive processes underlying these effects (as inferred from the content of participants thought listings) appeared to depend on

participants' motivation to engage in cognitive elaboration of the message content. Specifically, the effects of induced affect on unmotivated participants' attitudes were independent of the thoughts they had about the message content, suggesting the use of a heuristic processing strategy. In contrast, the effects of induced affect on motivated participants' attitudes were mediated by the favorableness of the thoughts they listed, suggesting the use of a substantive-processing strategy.

Although this data are provocative, the causal direction of the effects obtained by Petty et al. is not completely clear. Perhaps both motivated and unmotivated participants based their attitudes in part on their feelings. However, motivated participants, unlike unmotivated ones, tended to think more extensively about aspects of the issues that were consistent with this attitude in order to confirm its validity. To this extent, these attitudes may have influenced the thoughts they listed subsequently rather than the reverse.

In summary, we clearly share Forgas's (1992, 1995) belief that affect can play multiple roles in information processing. However, we are skeptical of his specific assumptions and of his interpretation of the results he uses to support them.

### B. Empirical Separation of the Influence of Affect

According to the conceptualization we propose, affect influences judgments as a result of (a) its activation of a processing strategy that stimulates the access and use of categorical knowledge (Postulate 2) and (b) its use as information about one's feelings about the object being judged (Postulates 3 and 4). The question is how to separate these and other possible influences of affect on judgments and to assess their relative contributions.

One strategy for attaining this objective was used successfully by Adaval (1996) to examine the role of affect in consumer judgment. Based on Anderson's (1971, 1981) information integration theory, Adaval postulated that evaluations of a commercial product ( $J$ ) are a weighted average of the evaluative implications of the pieces of information about its individual attributes. Specifically:

$$\underline{w_0}I_0 + \sum \underline{w_i}S_i$$

$$\underline{J} = \frac{\underline{I}_0 + \sum \underline{w}_i \underline{s}_i}{\underline{w}_0 + \sum \underline{w}_i} \quad (1)$$

where  $\underline{I}_0$  is the scale value (in units of favorableness) of an initial impression of the product that is formed prior to a scrutiny of its individual attributes,  $\underline{s}_i$  is the scale value of the  $i^{\text{th}}$  piece of information about the product, and  $\underline{w}_i$  is the subjective weight that is attached to this information.

The affective reactions to a given piece of information should be reflected in the scale value of this information; the attention paid to the information should be reflected in its weight, and the use of affective reactions as information about one's feelings toward the product as a whole (independently of one's reactions to the individual pieces of product information) should be reflected in the initial impression.

To evaluate these possibilities, participants who had been induced experimentally to feel happy or sad were asked to judge a series of products that varied in terms of both brand name (favorable or unfavorable) and (b) price (high or low). Additional judgments were made of products described by each attribute in isolation. Curve-fitting procedures were then used to estimate the weight and scale value associated with each level of price, each brand name, and the initial impression. This was done for each participant separately at each level of induced affect, in each of three product domains, and for each of four different judgments (estimates of the product's quality, the sacrifice incurred by purchasing it, the value of the product, and the willingness to purchase it).

Results were generally consistent with several hypotheses described in the previous sections concerning the impact of affect on judgments. However, some unexpected findings occurred as well. Specifically:

1. If persons engage in substantive processing of the sort postulated by Forgas (1995), they should attend to pieces of information that are evaluatively congruent with their mood. In terms of Equation 1, this should be reflected in the assignment of a greater weight ( $\underline{w}_i$ ) to mood-congruent pieces than to mood-incongruent ones. In fact, although Adaval's data showed a slight

tendency for this to be true, the effect was small and nonsignificant. Therefore, the mood congruence of the information was not a major contributor to its influence, consistent with Postulate 1 and contrary to Forgas's (1995) model.

2. According to Postulate 2, positive affect elicits an information-processing strategy that results in greater attention to categorical bases for judgment. Consistent with this postulate, brand information had more influence on judgments when participants were happy than when they were not, and this information received greater weight ( $w_i$ ) in the former condition. Unexpectedly, however, affect also influenced perceptions of the evaluative implications of brand information, as reflected in its scale value( $s_i$ ). Specifically, happy participants interpreted favorable brand names as more favorable, but unfavorable brand names as less favorable, than did unhappy participants.

This latter difference may be the result of processes similar to those observed by Herr (1986; Herr, Sherman, & Fazio, 1983) in a different content domain. That is, when people's affective reaction to the brand information they receive is similar to the affect they are already experiencing, they cannot easily distinguish between the two sources of affect. Consequently, affect from both sources is likely to influence their inferences of how they feel about the referent they are judging. However, when recipients' affective reactions to the brand information differ from the feelings they are experiencing for other reasons, the two sources of affect can be more clearly separated. In this case, recipients may use the irrelevant affect they are experiencing as a comparative standard in construing their feelings about the brand they are considering, and this may lead them to judge these feelings as have less favorable implications for their evaluations than they would otherwise.

3. Participants' initial impressions of the product's quality, and also of the sacrifice that would be incurred when purchasing it, both increased with the positive affect they were experiencing. The influence of affect on perceptions of sacrifice (a negative attribute) might seem surprising at first glance. However, quality and sacrifice are positively correlated in the real world; the higher the quality of a product, the more one must typically pay for it. It is

therefore conceivable that participants used their affective reactions as a basis for their initial impressions of quality, and then based their estimates of sacrifice on these impressions.

In summary, Adaval's research provides evidence that affect can have several of the effects suggested by our conceptualization. The applicability of Anderson's information integration model in isolating these effects should not be overgeneralized, however. The parameter estimation procedure involved in testing it requires the assumption that the absolute weight and scale value of each component piece of information are independent of the information accompanying it. This assumption is reasonable in the domain investigated by Adaval. That is, the different attributes of a given product may indeed be evaluated independently, and an overall judgment may be a weighted function of these evaluations. As Wyer and Carlston (1979; see also Wyer & Srull, 1989) point out, however, this assumption is unlikely to hold in many social judgment situations in which the pieces of information presented are responded to configurally. In forming person impressions, for example, the interpretation of a person's traits is likely to depend on their context (Asch, 1946; Wyer & Carlston, 1979). In such cases, the procedure used by Adaval to test implications of the Anderson model is inapplicable.

In fact, a study by Abele and Petzold (1994), indirectly supports this speculation. In their study, happy and unhappy participants formed impressions of a person described by sets of trait adjectives that varied systematically in their favorableness. In this study, only the scale value of participants' initial impressions was systematically influenced by the affect that participants experienced. The failure for affect to influence the weights and scale values of the individual pieces of information presented could simply indicate that the information was not processed in a way that made these parameters psychologically meaningful.

#### IX. TASK ANALYSES OF THE IMPACT OF AFFECT ON INFORMATION PROCESSING

The performance-feedback model we propose makes salient the fact that a clear understanding of how affective reactions influence goal-directed cognitive processing will ultimately require a specification of the requirements of the task to be performed. In the absence

of such a conceptualization, any conclusions that are drawn are likely to have unclear generalizability. To exemplify the approach that we consider necessary, we analyze two areas of research that we have discussed more generally earlier in this article: communication and persuasion and self-evaluation processes. In doing so, we do not attempt to review all of the theoretical and empirical work performed in these areas that is relevant to the issues we raise. Rather, our purpose is simply to show that an analysis along the lines we propose can lead to new hypotheses concerning the way in which affective reactions come into play.

### A. Communication and Persuasion

Positive affect can often decrease the effect of argument quality on recipients' acceptance of the position advocated. (For a review and analyses of the impact of affect on responses to a persuasive communication, see Schwarz, Bless, & Bohner, 1991.) In evaluating the generalizability of this effect, however, it is important to distinguish between two types of persuasive messages. One type is designed to change a belief (that is, the likelihood that a particular statement is true, or that an event will occur). The other is intended to change an attitude, or one's affective reactions to a person, object, event, or concept. The types of arguments that are typically contained in these communications and, therefore, the influence of affect on reactions to these arguments, are somewhat different.

#### 1. Belief-focused Communications

Belief-focused communications bear on the likelihood of a past, present, or future state of affairs (e.g, the likelihood that abortion will be legalized, or that the CIA is a major importer of heroin into the United States). The arguments contained in these messages typically focus on antecedents, or conditions that imply the existence of the state of affairs in question. Suppose, for example, that a communication is intended to increase the belief that abortion will be legalized. Such a communication might assert that feminists are actively lobbying for the legalization of abortion and, if this is so, the event will occur. As noted by McGuire (1960, 1991; see also Wyer, 1974), these arguments often compose the premises of a syllogism with the form "A; if A, then B; B" (e.g, feminists are lobbying for abortion; if feminists are lobbying,



abortion will be legalized; therefore, abortion will be legalized), the conclusion of which describes the state of affairs being asserted. In this type of communication, a strong argument is one that logically implies the conclusion and can easily be recognized as such. That is, it bears on premises of the form "A; if A, then B," or their equivalents.<sup>10</sup> In addition, however, the argument bearing on premise A must be plausible; that is, it must increase the recipient's belief that A is true.

## 2. Attitude-Focused Communications

An attitude-focused persuasive message argues that a particular referent is more or less desirable. This referent could be a person, an event, a social policy, or a course of action (behavior). The cognitions on which an attitude-focused message focuses are captured by the model of attitude formation proposed by Fishbein (1961; see also Fishbein & Ajzen, 1975). According to this formulation, attitudes toward an event or behavior are an additive function of the desirability of its possible consequences, each weighted by the belief that the consequence will occur. Given this conceptualization, a strong argument is one that either (a) increases beliefs that the target event will have a consequence the recipient already considers desirable, or (b) increases perceptions of the desirability of a consequence that the recipient already believes would occur. In most research on the effects of attitude-focused communications, manipulations of argument strength have not explicitly distinguished between these two effects.

## 3. The Role of Affect

The way in which affective reactions influence the impact of a persuasive communication is likely to depend substantially on whether the communication is belief-focused or attitude-focused. The conclusion of a belief-focused message is evaluated on the basis of descriptive criteria. Therefore, according to the conceptualization we have proposed, affect is unlikely to have a direct, informational influence on the acceptance of this conclusion. Nor is affect likely to influence the implications of knowledge that is retrieved from memory and brought to bear on evaluations of the conclusion. Rather, any impact that affect is likely to have should be mediated by its influence on either (a) participants' assessment of the logical coherence of the arguments

contained in the message, or (b) the amount of knowledge that is retrieved and used to assess the plausibility of these arguments. (For evidence of the impact on affect on syllogistic reasoning, see Fiedler, 1988).

In contrast, an attitude-focused communication is effective because it leads the recipient to experience positive or negative affective reactions, and these reactions are used as basis for evaluating the desirability of the behavior or state of affairs specified in the conclusion (Path 9, Figure 1). Suppose the strength of arguments contained in the communication is primarily a function of the desirability of the consequences it describes and, therefore, the affect that results from thinking about these consequences. Then, the influence of argument strength on the impact of the communication is likely to depend on whether recipients (a) think about the consequences described in the message in sufficient detail for the affect associated with them to be elicited, (b) combine the affect elicited by different consequences into a single affective response to the referent as a whole (Fishbein, 1967; Fishbein & Ajzen, 1975), and (c) distinguish this affect from the affect they are experiencing for other reasons. Note that if the latter distinction is not clearly made, message-irrelevant sources of affect are likely to have a direct informational influence on recipients' perceptions of how they feel about the conclusion being advocated and, therefore, their acceptance of this conclusion. This direct, informational influence of affect should not occur in the case of a belief-focused communication.

The influence of affect on responses to each type of communication may depend on the processing objective that recipients have at the time they read it. As implied by the performance-feedback model we propose, recipients with the objective of making an accurate assessment of the validity of a conclusion may process the information less extensively if they are experiencing positive affect and use these feelings as an indication that they have thought sufficiently about the message content to make a judgment. Thus, in the case of a belief-focused communication, happy individuals may tend less to identify logical inconsistencies in the arguments presented (Fiedler, 1988), and be less inclined to retrieve sufficient prior knowledge to assess their plausibility. Alternatively, if the message is attitude-focused, they may be less inclined to assess

the likelihood and desirability of the individual consequences described in the message. In contrast, participants who read the message for enjoyment may be more likely to engage in these activities than unhappy recipients. On the other hand, persons should use the affect they are experiencing as a direct basis for judgments (Path 9, Figure 1) when they are considering an attitude-focused message, but not when they are considering a belief-focused message and this might be true regardless of their processing objective.

## B. Self-Evaluation Processes

### 1. General Considerations

Judgments of oneself can pertain to many things, including specific traits, general self worth, life satisfaction, and the likelihood of future life events. These judgments are based on different types of self-knowledge and require different amounts of cognitive computation. Self-knowledge can include episodic memories of past behaviors or experiences, self descriptions that one has generated in the course of previous information processing, or general concepts of oneself and one's behavior in certain types of situations. As Klein and Loftus (1990) have found, these types of self knowledge may be stored in memory and retrieved independently of one another.

Many self-relevant concepts and knowledge representations are likely to elicit affective reactions. However, whether these reactions are used as a basis for judgments, depends in part on their relevance. Judgments of self-esteem or life satisfaction may be fundamentally estimates of one's own feelings about oneself or about one's life as a whole. Trait judgments, on the other hand, are more likely to be based on descriptive criteria.

In conceptualizing conditions in which different criteria for self-judgments are applied, it is useful to apply a "race" model of procedural knowledge similar to that suggested by Logan (1988). Specifically, when a self-judgment is required, a number of different cognitive procedures for generating the judgment may be activated simultaneously. These processes could include (a) a search for a previously formed judgment-relevant trait description, (b) the identification of a judgment-related past experience and a construal of its implications for the

judgment to be made, and (c) if relevant, the assessment of the implications of the affective reactions one is experiencing. Situational or individual difference factors that make one process easier to use than another will increase the likelihood that this process "wins." An additional consideration, however, is implied by the feedback conceptualization of performance evaluation described earlier. That is, participants who have generated a response on the basis of the "winning" procedure may spontaneously ask themselves if they feel that this response is a sufficient basis for judgment. Participants who are experiencing positive affect may answer this questions affirmatively, whereas those who are experiencing negative affect may not. Therefore, the "winning" criterion is more likely to be employed by happy persons than by unhappy ones. The influence of affect on four different types of self-judgments are worth considering from this perspective judgments of global life satisfaction, judgments of self-worth, specific trait judgments, and estimates of personal risk.

## 2. Judgments of Life Satisfaction

A request to judge one's life satisfaction might activate three different processes. First, respondents might search for a previously formed concept of their life as a whole that is directly applicable to the judgments. Second, they might recall one or more previous life events that are relevant to the judgment and base their response on the affect that is elicited by these memories. Finally, they might assess the affect that they happen to be experiencing at the time and use this as indicated of their feelings about life in general. These processes, which might occur simultaneously, are summarized in Figure 4.

On a priori grounds, it is unclear which of these processes will predominate. For example, if persons in an experiment have a previously formed concept of their life as a whole, a request to estimate their life satisfaction might spontaneously activate this concept and so a judgment can quickly be computed on the basis of the affect it elicits. On the other hand, persons are infrequently called upon to make this type of judgment in daily life. Consequently, they may often not have a previously formed concept of their life as a whole stored in memory, and must compute a judgment at the time they are asked to report it. In this case, it would normally take

less time to compute a judgment on the basis of the transitory affect one is experiencing at the time of judgment than to do so on the basis of other, less easily accessible criteria, and so judgments are more likely to be based on the former computation. Evidence that transitory affect is used as a basis for life satisfaction judgments independently of any specific self-knowledge they have available (Schwarz & Clore, 1983; Strack, et al., 1985) is consistent with this hypothesis.

However, the performance-feedback model we have proposed raises a further consideration. People who experience positive affect for reasons that are objectively unrelated to their life situation might not only use these feelings as a basis for judgment but also consider this criterion to be sufficient. In contrast, persons who experience negative affect might be disposed to question the sufficiency of this criterion. Therefore, they might either search for other judgment-relevant information or, if no alternative criteria are easily available, might adjust for the bias that results from their use of their feelings as information.

Schwarz and Clore's (1983, Experiment 1) findings support this conjecture. In this study, happy persons appeared to use their feelings as a basis for judging their life satisfaction regardless of situational factors that had implications for its validity as a basis for judgment. In contrast, unhappy participants adjusted their judgments to compensate for the effects of these factors. Both happy and unhappy participants may have spontaneously considered the affect they were experiencing as a potential basis for judgment. However, whereas happy participants concluded that these feelings were a sufficient basis for judgment without thinking about situational factors that might influence them, unhappy participants considered that an assessment of their feelings was insufficient and took situational factors into account as well.

### 3. Judgments of Self Worth

Estimates of self worth, like estimates of life satisfaction, may typically be based on feelings about oneself. If this is so, these feelings are likely to be estimated by either (a) retrieving a previously formed concept of oneself with which affective reactions have become associated through learning; (b) recalling descriptive knowledge about oneself to which affective

reactions have become conditioned and combining the implications of these reactions to arrive at an overall estimate of one's feelings, and (c) assessing the implications of the transitory affect that one happens to be experiencing for reasons that may or may not actually be relevant. If a previously formed concept of "self" exists and is activated by the request to evaluate one's self worth, the affective reactions elicited by this concept might be used as the basis for judgment. If such a concept has not previously been formed, however, and if the affective reactions based on descriptive self knowledge take time to compute, the transitory affect one happens to be experiencing for other reasons is likely to win the "race."

The aforementioned study by Levine et al. (1994) bears on this possibility. In this study, the descriptive implications of participants' recalled experiences only affected their judgments of competence in the domain to which the experiences were relevant. However, participants' estimates of their global self esteem were influenced by the affect elicited by the life event they had recalled regardless of its descriptive implications. In terms of our conceptualization, this suggests that participants in this study did not have a previously formed concept of themselves easily accessible in memory. Therefore, they based their judgments on the affect they were experiencing at the time, regardless of whether or not the event that elicited the affect was self-relevant.

#### 4. Trait Judgments

Judgments of the specific traits one possesses are more likely to be based on descriptive rather than affective criteria. The processes that underlie these judgments are summarized in Figure 4b. Specifically, persons who are asked if they have a specific trait may recall and report a previously formed concept of themselves with respect to this trait. Alternatively, they may infer the trait from the descriptive implications of trait-relevant self knowledge that they have acquired (e.g., behaviors that exemplify the trait, descriptions of oneself by others, etc.).

For affective reactions to have an informational influence on trait judgments, mediating computations must be performed in order to transform these reactions into descriptive terms. For example, people who experience negative affect might judge themselves as incompetent on the

basis of reasoning: "I feel badly about myself; incompetence makes people feel badly; therefore, I am incompetent." The syllogism implied by this reasoning (A; B implies A; therefore, B) is not logically valid. The computation of trait judgments based on this reasoning is likely to take longer than computations based on descriptive criteria. This is particularly true if a trait-relevant experience is easily accessible in memory at the time of judgment. Levine et al.'s (1994) results are consistent with this hypothesis. That is, the descriptive implications of participants' recalled life experiences were used as a basis for judgments of attributes to which they were relevant. The affective implications of recalled experiences only influenced judgments of attributes in a domain to which these experiences were unrelated.

Implications of the performance-feedback model are also of interest in this context. To the extent that trait judgments are likely to be computed more quickly on the basis of descriptive criteria than on the basis of affective criteria, persons who experience positive affect should be more likely to infer that these criteria are sufficient, whereas persons who experience negative affect are more likely to consider additional criteria. This implies in contrast to judgments of life satisfaction and self worth, trait inferences are more likely to be influenced by negative affect than by positive affect.

### 5. Likelihood Estimates

To predict the future, an individual could in principle conduct an exhaustive search of memory for similar events that have occurred previously, and use the incidence of such events to estimate the probability that they will occur. It seems more likely, however, that persons will employ an availability heuristic (Tversky & Kahneman, 1973) and base their judgment on the ease with which exemplars of the type of event being considered come to mind. Alternatively, as suggested by Johnson and Tversky (1983; see also Costans & Mathews, 1993), persons might use the affective reactions elicited by a concept of the event as an indication of likelihood. That is, if people experience negative affective reactions to an event, they may infer that they are worried about it. Therefore, they may estimate its likelihood to be greater than persons who do not have

these reactions.<sup>11</sup> Correspondingly, persons may infer that the likelihood of a positive event is greater if they experience positive affect while thinking about it than if they do not.

Figure 4c summarizes these possibilities. Assuming that each step of processing takes about the same amount of time, this figure implies that estimates are normally made more quickly on the basis of affective reactions than on the basis of an availability heuristic. It is again interesting to consider the implications of the performance-feedback model of affect we have proposed. That is, suppose persons are more likely to perceive the first basis for judgments they consider to be sufficient if they are experiencing positive affect than if they are experiencing negative affect. Then, they should be more likely to base their estimates of positive life events (which elicit positive affect) on their affective reactions to the events than to base their estimates of negative life events on this criterion.

#### 6. Summary

It is clearly necessary to distinguish between the different types of self judgments that might be made, and the processes that underlie them, in order to understand how affective reactions are likely to contribute to these judgments. Of particular importance is whether affective reactions provide the primary basis for the type of judgment being made or come into play only when more directly relevant criteria are difficult to apply. Without distinguishing between these two general types of judgments, general conclusions concerning the effect of affective reactions on self judgments are difficult to draw.

### XI. CONCLUDING REMARKS

The conceptualization of affect proposed in this article distinguishes between the affective reactions that persons subjectively experience and the cognitions that elicit these reactions. An analysis of the effects of these reactions at different stages of processing reveals that they have their primary influence as a result of the information they provide about both (a) persons and objects to which the reactions are directed and (b) the likelihood that one's processing objective has been satisfactorily attained.

The performance-feedback conceptualization suggested by Martin et al.'s (1993) findings



can account for many effects of affective reactions on task performance and on behavior more generally. There is nevertheless a need to evaluate more precisely the cognitive activities that are involved in pursuing a particular processing goal in order to predict the impact of affective reactions on goal-relevant judgments and behavior. Our analyses of the conditions in which affect is likely to influence responses to a persuasive message, and to have an impact on self evaluations, exemplify this need.

The theoretical framework we have proposed has numerous specific implications for the conditions in which affect is likely to influence information processing and the nature of this influence. However, the integrative utility of the formulation should not be overlooked. This integration is necessary for continued progress in understanding the interface of affect and cognition. The many specific theories that have emerged postulate processes that are typically not incompatible. However, these processes come into play at different times and in different conditions. The conceptualization we have outlined provides a framework within which these contingencies can potentially be identified and their relevance to a more general understanding of the role of affect in information processing can be understood.

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## Footnotes

<sup>1</sup>This definition of course differs from the tripartite conception of attitudes as having cognitive and behavioral components as well as an affective one (Rosenberg and Hovland, 1960). However, the latter conception can lead to conceptual confusion for reasons noted by Wyer and Carlston (1979; see also Petty, Priester, & Wegener, 1994). We prefer to restrict our definition to the affective dimension, thereby relegating the relations among attitudes, beliefs and overt behavior to empirical or theoretical inquiry.

<sup>2</sup>The accessibility of these concepts, in turn, can be influenced by (a) the goal that recipients happen to be pursuing, (b) transitory situational factors that have led these cognitions to be activated and applied (Bargh, 1984, 1994, 1997; Higgins, Bargh, & Lombardi, 1985; Higgins & King, 1991; Wyer & Srull, 1989), and (c) the frequency with which the concepts have been used in the past (Higgins et al., 1985; Wyer & Srull, 1979). The frequency of using concepts and knowledge can, in turn, influence their "chronic" accessibility in memory (Bargh, Bond, Lombardi, & Tota, 1986; Bargh, Lombardi, & Higgins, 1988; Klinger, 1975).

<sup>3</sup>The procedures can sometimes be activated and applied without awareness of the goal to which they are relevant (Bargh, 1997). For our present purposes, however, we assume that individuals are typically conscious of the goals toward which their behavior is directed, although many of the cognitive steps involved in attaining these goals might be performed automatically (Wyer & Srull, 1989).

<sup>4</sup>Bargh et al. (1992) find that the effects observed by Fazio et al. (1986) are more likely to occur when participants' attitudes toward the stimuli presented are reported before the priming task in the same experimental sessions, and that the contingency of priming effects on attitude strength disappears when a greater delay is imposed between attitude measurement and the test situation. This contingency also suggests that Fazio et al. may be tapping an influence of affect that occurs over and above the effect observed by Bargh et al., and that requires a recent activation of the affective reactions associated with the priming stimuli in order to occur.

<sup>5</sup>This decrease in detail does not necessarily reflect a general decay of the features that

compose this representation. Rather, new, less detailed representations may be formed of the experience in the course of processing that occurs subsequent to its construction (e.g., communicating about the experience to others) and that these, more recently formed representations become relatively more accessible in memory than the originals (for a theoretical treatment of the cognitive mechanisms that underlie such effects, see Wyer and Srull, 1986, 1989).

<sup>6</sup>In this and other studies cited in this article, affect was induced under hypnosis. However, although people are unable to recall information they have been told to forget under hypnosis, the semantic concepts that were activated in the course of responding to this information remain highly accessible and influence responses once persons are no longer hypnotized. (cf. Kihlstrom, 1980).

<sup>7</sup>Results reported by Erber (1994) might appear inconsistent with this conclusion. He found that affect induced through an unobtrusive manipulation of participants' facial expressions (cf. Strack et al., 1988) increased participants' recall of trait terms that were congruent in valence with affect they were experiencing. However, recall was assessed following a task in which the trait terms may have been differentially processed in the course of making judgments to which they were relevant. Therefore, differences in the later recall of these traits may have been the result of this factor rather than affect per se.

<sup>8</sup>The mood-incongruent retrieval effects obtained by Parrott and Sabini were restricted to the first experience that participants recalled; the second one they recalled was typically mood-congruent. However, this reversal can also be explained in terms of the mediating impact of the thoughts that participants were likely to have in the situations being investigated. For example, happy persons who were stimulated to think that "I did not feel as good in high school as I do now", and to recall an experience that confirmed this thought, may then have been stimulated to think that "it wasn't all that bad," and to recall a favorable (mood-congruent) experience that confirmed this thought. Unhappy person's cognitive responses might have been analogous. (For an elaboration of this speculation, see Wyer & Srull, 1989).

<sup>9</sup>Although the features of a precondition can sometimes correspond to representations that are stored in memory as part of declarative knowledge, their role is quite different. Moreover, they can function independently of this knowledge. Bargh, Chen, and Burrows (1996, Experiment 1), for example, found that the activation of semantic concepts can influence situation-specific behavior without affecting the use of these concepts to interpret information to which they are relevant. In the present context, affective reactions could likewise be part of a precondition that elicits behavior independently of its association with concepts that compose declarative knowledge.

<sup>10</sup>Premises of the form "A; if not B, then not A" (e.g., "feminists are actively lobbying for abortion rights; if abortion weren't ultimately going to be legalized, they wouldn't be lobbying") would be logically equivalent to the premises "A; if A, then B", and therefore would imply the conclusion B. However, premises of the form "A; if not A, then not B" (for example, "feminists are actively lobbying; if feminists were not actively lobbying, abortion would not be legalized") would not logically imply this conclusion.

<sup>11</sup>In principle, negative affect could be interpreted as an indication that one perceives the event being considered to be particularly aversive rather than as being likely to occur. However, Johnson and Tversky's (1983) results suggest that the latter inferences predominate.

Figure Captions

1. Conceptual path diagram showing (a) the cognitive determinants of affect and (b) the cognitive consequences of affect for processes involved in goal-directed cognitive activity.
2. Hypothetical effects of mood induction procedures on information retrieval and the encoding of new information. Solid lines indicate paths postulated by proposed conceptualization. Dashed lines denote paths implied by the assumption that affective reactions function as concepts in memory.
3. Effects of trait-description of a target person on judgments by happy and unhappy persons for whom the source of their affective reactions (a) was not and (b) was made salient (adapted from Isbell, Clore, & Wyer, 1997).
4. Processing stages involved in making (a) global judgments of life satisfaction and self-esteem, (b) specific trait judgments, and (c) estimates of the likelihood of future life events.