

Feelings and Phenomenal Experiences

Norbert Schwarz
University of Michigan
and
Gerald L. Clore
University of Virginia

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Contact information:

Norbert Schwarz

Institute for Social Research

University of Michigan

526 Thompson St

Ann Arbor, MI 48106-1248

nschwarz@umich.edu

Following an initial emphasis on “cold” cognitive processes, which could be conceptualized within the computer metaphor of the information processing paradigm, social cognition researchers rediscovered “hot” cognition in the 1980’s. Two decades later, their interest in the interplay of feeling and thinking is shared by researchers in decision making, cognitive psychology, and related fields. This chapter reviews what has been learned; it focuses on basic theoretical principles and empirical regularities, rather than complete coverage of the literature. We first introduce three broad approaches to the interface of feeling and thinking and subsequently evaluate them in light of empirical findings in three key domains, namely, human judgment, strategies of information processing, and memory. Throughout, we emphasize the influence of feelings on cognitive processes; the reverse influence of cognition on emotion is reviewed by Clore, Schwarz, and Conway (1994) and Ellsworth and Scherer (2003).

APPROACHES TO FEELING AND THINKING

Three general approaches to the role of feelings in human cognition focus on the experiential, cognitive, and somatic components of feelings, respectively. The first approach emphasizes the experiential quality of feelings and addresses their informational functions. A second approach emphasizes the thoughts that accompany feelings, whereas a third approach emphasizes hard-wired processes, focusing on the somatic components of affective states.

The Experiential Component of Feelings: Feelings as a Source of Information

Central to the experiential approach is the assumption that feelings can serve as a source of information in their own right. This assumption is consistent with traditional theorizing on emotions and has been fruitfully extended to other subjective experiences.

Affective, Bodily, and Cognitive Experiences

Social psychologists often subsume moods and emotions under the generic term *affect*. This term, however, can also refer simply to valence -- the positive and negative aspect of things. All emotions are affective, but not all affective things are emotions. *Emotions* arise in response to ongoing, implicit appraisals of situations with respect to positive or negative implications for one's goals and concerns (e.g., Ortony, Clore, & Collins, 1988; Smith & Ellsworth, 1985). They have an identifiable referent (what the emotion is "about"), a sharp rise time, limited duration, and often high intensity. Emotion researchers commonly assume that "emotions exist for the

sake of signaling states of the world that have to be responded to, or that no longer need response and action" (Frijda, 1988, p. 354). What exactly emotions signal can be derived from their underlying appraisal patterns. Sadness, for example, signals a loss or lack of reward that is not attributed to the causal action of another agent; when it is attributed to the causal action of another agent, it gives rise to anger. Accordingly, sadness and anger do not only inform us about a loss, but also about its likely cause, giving rise to different attributions in judgment studies (e.g., Keltner, Ellsworth, & Edwards, 1993).

Moods, on the other hand, lack a clear referent, may come about gradually, may last for an extended time, and are often of low intensity (Morris, 1989). The experience of a positive or negative emotion may also leave us in a positive or negative mood after the emotion dissipates and its specific cause is no longer attended to (Bollnow, 1956). This difference between moods and emotions is apparent in ordinary language when we say that we are angry "about" something, but that we are "in" a bad mood. Hence, moods mostly convey generic valence information that has no clear referent, which accounts for their pervasive influence.

Bodily experiences include feelings like hunger, pain and physiological arousal, which inform us about specific states of the organism. These experiences can be informative in their own right and induced physical arousal (e.g., Zillman, 1978) or proprioceptive feedback from facial expressions (e.g., Strack, Martin, & Stepper, 1988) and arm flexion and extension (Friedman & Förster, 2000) can convey information that influence judgment and information processing.

Finally, *cognitive experiences* like surprise, amazement, boredom or feelings of familiarity inform us about knowledge states. Two cognitive experiences that received particular attention are the metacognitive experiences of accessibility and processing fluency. *Accessibility experiences* refer to the ease or difficulty with which information can be brought to mind or thoughts can be generated. They can serve as input into a large variety of judgments; their specific impact is highly malleable and depends on which naïve theory of mental processes is brought to bear on the task (Schwarz, 2004).

Processing fluency refers to the ease or difficulty with which new, external information can be processed. Variables like figure-ground contrast, presentation duration, or the amount of previous exposure to the stimulus affect the speed and accuracy of low-level processes concerned with the identification of a stimulus' physical identity and form; they influence

perceptual fluency (e.g., Jacoby, Kelley & Dywan, 1989). Variables like the consistency between the stimulus and its context or the availability of appropriate mental concepts for stimulus classification affect the speed and accuracy of high-level processes concerned with the identification of stimulus meaning and its relation to semantic knowledge structures; they influence *conceptual fluency* (e.g., Whittlesea, 1993). Empirically, both types of fluency show parallel influences on judgment (for a review see Winkielman et al., 2003) and can be subsumed under the general term *processing fluency*. Which inferences people draw from experienced processing fluency again depends on the naïve theory of mental processes that they bring to bear on the task (Schwarz, 2004). In addition, high fluency is experienced as hedonically positive (as captured by psychophysiological measures, Winkielman & Cacioppo, 2001) and this affective response can itself serve as a basis of judgment (Winkielman et al., 2003).

As our review will indicate, all of these experiences can influence how we evaluate a stimulus and which strategy of information processing we adopt; they also receive increasing attention in the study of memory.

Judgment

Central to the feelings-as-information approach is the assumption that people draw on their affective, cognitive, and bodily experiences as a source of information. In the case of moods and emotions, people may use their apparent affective response to a target as information in forming an evaluative judgment (e.g., Schwarz & Clore, 1983; Wyer & Carlston, 1979). This possibility is most obvious when the judgment refers, by definition, to one's affective reaction to the stimulus. For example, when asked how much we like a person, we may base the judgment on our feelings towards them rather than on a review of their attributes. Also, when a judgment does not refer directly to our feelings but poses a task that is particularly complex and demanding, we may simplify the task by asking ourselves, "How do I feel about it?" (Schwarz & Clore, 1988). When the apparent affective response is indeed elicited by the target, it provides meaningful information that is relevant to the judgment at hand. Pham, Cohen, Pracejus, and Hughes (2001) observed that people can monitor and report the feelings elicited by moderately complex targets, like pictures or advertisements, very rapidly – in fact, more rapidly than their cognitive responses, consistent with Zajonc's (1980) affective primacy hypothesis.

Because we have only one window on our experience, it is difficult to distinguish *integral* feelings, elicited by the target, from *incidental* feelings that happen to be present at the time.

Hence, we may mistake incidental feelings, like a pre-existing mood, as part of our reaction to the target. This results in judgments that are congruent with the implications of our feelings, most notably in more positive evaluations under happy rather than sad moods. To disentangle the contributions of the perceiver's feelings from other information about the target, experimental tests of the feelings-as-information hypothesis usually rely on the induction of incidental affect. This gave rise to the erroneous conclusion that "affect can only serve as a heuristic cue due to mistaken inferences," suggesting that reliance on one's feelings "is an ineffective and dysfunctional strategy" (Forgas, 2001, p. 104). This assertion confuses the operational and theoretical level and is at odds with a long tradition of theorizing that emphasizes the signaling functions of affective responses (see Frijda, 1988; Zajonc, 1980). Feelings can serve as a basis of accurate as well as mistaken inferences, depending on the relationship between the feeling and the target. In fact, a growing body of work (see Damasio, 1994; Feldman-Barrett & Salovey, 2002) indicates the adaptive value of attending to one's feelings in judgment and decision making.

However, our feelings only influence judgment when they seem relevant to the task at hand. Hence, their influence is *eliminated* when we, correctly or incorrectly, assume that they are indeed incidental, thus calling their informational value into question (e.g., Schwarz & Clore, 1983). Note that this proposition does *not* imply that mood effects on evaluative judgments require a conscious attribution of one's feelings to the target, in contrast to what some interpreters (e.g., Forgas, 1995a) suggested (for a discussion, see Schwarz, 2001). People usually consider their experiences, ranging from their feelings to the thoughts that come to mind, to be "about" whatever is in the focus of their attention. This observation has been termed the aboutness (Higgins, 1998) or immediacy principle (Clore et al., 2001); it is reminiscent of the Gestalt observation that stimuli presented in close temporal or spatial proximity are experienced as connected (Heider, 1958). Accordingly, reliance on our thoughts and feelings is the automatic default operation and does not require a conscious attribution, whereas discrediting thoughts and feelings does.

The differences between moods and emotions, noted above, suggest that people are more likely to be aware of the cause of their emotions than of the cause of their diffuse moods; this limits the likelihood that they misread their emotions as a response to an unrelated target. Moreover, emotions reflect specific appraisal patterns and hence provide more specific

information than global moods, which mostly indicate valence. Finally, the same basic logic applies to bodily sensations as well as accessibility and fluency experiences. As our review will indicate, people only draw on these experiences as a source of information when their informational value is not discredited.

Processing Style

Moods, emotions, and bodily sensations have also been found to influence people's processing strategies. From the feelings-as-information perspective, these experiences inform us about the benign or problematic nature of the current situation. This, in turn, influences which processing strategy we adopt, consistent with the assumption that human cognition is situated and adaptively tuned to meet situational requirements (see Schwarz, 2002).

Feelings that signal a problematic environment foster systematic, bottom-up processing with considerable attention to detail. As Wegner and Vallacher (1986) noted, this style of reasoning is adaptive when we encounter problems in the pursuit of our goals. We also adopt it when bodily avoidance feedback (e.g., Friedman & Förster, 2000) or emotions that entail a high uncertainty appraisal (e.g., Tiedens & Linton, 2001), correctly or incorrectly, provide an experiential "problem" signal. Conversely, feelings that signal a benign environment are typically associated with more heuristic processing and increased reliance on the top-down use of pre-existing knowledge structures, unless otherwise required by the task at hand (e.g., Bless et al., 1996). As predicted by the feelings-as-information approach, these differences in processing style are eliminated when the informational value of the feeling is called into question through attribution manipulations (e.g., Sinclair, Mark, & Clore, 1994).

Empirically, influences of feelings on processing style have been observed across a wide range of tasks, including problem solving (for a review see Schwarz & Skurnik, 2003), stereotyping (for a review see Bless, Schwarz, & Kemmelmeier, 1996), and persuasion (for a review see Schwarz, Bless, & Bohner, 1991). We address distinctions between several related conceptual models in our review of the evidence.

Memory

Experiential considerations played a key role in early treatments of memory processes, but have lost popularity and were rediscovered only recently (Brewer, 1992). The accumulating work (for a review see Kelley & Rhodes, 2002) documents a pervasive role of feelings of familiarity, which arise from processing fluency. For example, Jacoby and Dallas (1981)

observed that participants could accurately recognize previously shown rare words, but provided numerous false alarms in response to common words. Apparently, they misattributed the familiarity resulting from their frequent exposure to common words to the recency of exposure, erroneously concluding that the word was part of the preceding learning task. Such findings parallel the role of processing fluency in judgment. However, other memorial activities, like retrieving facts from long term memory, do not involve phenomenal experiences (Brewer, 1992).

Whereas the role of cognitive experiences in memory is increasingly well understood, the influence of moods and emotions on memory has rarely been addressed from an experiential perspective. One approach to this issue (e.g., Bless, 1996) assumes that mood-congruent recall may arise from initial mood effects on evaluative judgment. When asked to recall events from our kindergarten days, for example, we may first wonder what they were like. When in a good mood, we may arrive at a more pleasant assessment, which may then serve as input into reconstructive memory processes (Ross, 1989), resulting in the “recall” of more pleasant events.

The Cognitive Component of Feelings: What Comes to Mind

An alternative approach traces the influence of feelings to the thoughts that accompany moods and emotions. In a pioneering series of studies, Isen and colleagues (1978) observed pronounced mood effects on evaluative judgments. To account for them, they suggested a “cognitive loop” in the form of higher accessibility of mood-congruent information stored in memory. At the same time, Bower (Bower, Monteiro, & Gilligan, 1978; Bower, 1981) conceptualized the operation of affective states in a general network model of human memory. He represented emotions as central nodes in an associative network, which are linked to related ideas, events of corresponding valence, autonomic activity, and muscular and expressive patterns. When new material is learned, it is associated with the nodes that are active at the time of learning, including the respective emotion nodes. When an emotion node is stimulated later on, activation spreads along the pathways, increasing the activation of other, connected nodes; activation of a node above a certain threshold brings the represented material into consciousness.

Memory

Bower’s (1981) model and related conceptualizations (e.g., Isen et al., 1978; Spies & Hesse, 1986; Wyer & Srull, 1989) generate two key predictions. A *state dependent learning and recall* hypothesis holds that material learned in one affective or bodily state is more likely to be

recalled when we are in the same rather than another state. Whereas this prediction pertains to matching states at learning and recall, a *mood congruency hypothesis* pertains to matching valences of the affective state and the to-be-recalled material. It holds that positively (negatively) valenced material is more likely to be recalled in positive (negative) moods. Although these hypotheses are conceptually distinct, they are often difficult to distinguish empirically (Morris, 1989). In fact, mood congruent recall has been most reliably observed in the domain of autobiographical memory, with happy events being more likely to be recalled under happy than sad moods (see Blaney, 1986, for a review). However, happy events are likely to have put one into a happy mood at the time they occurred. Accordingly, mood congruency in autobiographical recall could be due to either state dependency or mood congruency.

Critics of Bower's (1981) model questioned the plausibility of the assumed links between positive (negative) moods and *all* positive (negative) material stored in memory; this structure should reduce the activation of any given node as a function of the overall number of nodes activated. Moreover, an extensive review of relevant experiments (Wyer, Clore, & Isbell, 1999) concluded that reported effects of mood on the recall of valence-congruent semantic concepts in memory may be due to the inadvertent activation of mood-relevant concepts as part of the mood-induction procedure, rather than to mood per se.

Judgment

If some aspect of mood does affect the recall of valenced material, it should also affect tasks to which the material may be relevant. Accordingly, a *mood congruent encoding* hypothesis suggests that ambiguous material would be encoded in terms of mood congruent concepts. Moreover, associations that come to mind subsequently (regardless of the ambiguity of the material) may also be mood congruent, resulting in *mood congruent elaboration*. By the same token, mood congruent recall of information about the target is assumed to result in *mood congruent judgments*. Finally, any impact of mood congruent recall and elaboration predicted to be more pronounced the more the judgment involves substantive thought (Forgas, 1995a), that is, under conditions of high processing motivation and low time pressure.

Processing Style

Mood congruent recall assumptions can also be used to predict affective influences on styles of information processing. If a given affective state brings a large amount of congruent information into consciousness, it may limit the *cognitive resources* required for working on

other tasks. However, it is unclear which mood is most likely to constrain resources. On the one hand, negative affective states are associated with intruding thoughts and ruminations (e.g., Martin & Tesser, 1989) and people in an induced or chronic negative mood have difficulty suppressing mood-congruent material when instructed to do so (e.g., Wenzlaff, Wegner, & Roper, 1988). Hence, Ellis and Ashbrook (1988) suggested in their resource allocation model that *negative* affective states interfere with information processing. On the other hand, Isen (1987, p. 217) hypothesized that positive material in memory "is more extensive and at the same time better integrated, so that positive affect is able to cue a wide range of thoughts." Accordingly, Mackie and Worth (1989) proposed that *positive* affective states can limit attentional resources due to intruding positive thoughts. Neither proposal can account for the bulk of the available findings, as reviewed below.

Finally, we note that models focusing on *what* comes to mind do not provide an easy way to conceptualize the role of cognitive experiences. Although they can account for affective influences on ease of recall and fluency of processing, the judgment effects of experienced accessibility and fluency can not be conceptualized without making assumptions extraneous to associative network models.

The Somatic Component of Feelings: A Hard Interface?

The somatic component of feelings has been addressed in two different ways. As Zajonc and Markus (1984) noted, most theories postulate some form of experiential mediation between somatic processes and judgments or other outcomes (e.g., Izard, 1977; Leventhal, 1982; Schachter & Singer, 1962; Tomkins, 1962). Hence, we treat such theories in the context of experiential approaches. As an alternative, Zajonc and Markus (1984) suggested that the impact of somatic processes may be hard-wired instead of experientially mediated. For example, Zajonc and collaborators emphasized possible representational functions of the motor system (e.g., Adelman & Zajonc, 1989) and suggested a crucial role for the vascular system of the head in emotion regulation (Zajonc, Murphy, & Inglehart, 1989). Much of this work focuses on somatic processes as determinants of emotion and little is known about their role in mediating the consequences of emotions. Reflecting the paucity of research that bears on this mediational issue, and the limits of our expertise, we do not address this perspective in the present chapter, which focuses on feelings, that is subjective experiences.

FEELINGS AND JUDGMENT

Next, we review research on the impact of different feelings on social judgment and highlight similarities in the informative functions of affective, cognitive, and bodily experiences. Where applicable, we contrast predictions derived from the general approaches discussed above.

Moods

All models predict more positive judgments under happy than sad moods. This prediction is well supported, with exceptions addressed below. From a feelings-as-information perspective (Schwarz & Clore, 1983, 1988; Wyer & Carlston, 1979), mood-congruent judgments arise because people misread incidental moods as part of their apparent affective reaction to the target; from a mood-congruent recall perspective (Bower, 1981), they arise because moods bring different associations to mind. These perspectives lead to different predictions about the conditions under which mood-congruent judgment should be observed.

Perceived Informational Value

If feelings serve as a source of information, their impact should depend on their perceived informational value. We should discount our feelings as a source of information when there is reason to assume that they may not reflect our reaction to the target, but should see them as particularly informative when our apparent reaction to the target contradicts the plausible impact of other influences. Such discounting and augmentation effects (Kelley, 1972) cannot be derived from the assumption that moods or emotions affect judgment through the selective recall of information from memory (e.g., Bower, 1981) or by hard-wired processes (e.g., Zajonc & Markus, 1984). These assumptions predict main effects of affective states, whereas the feelings-as-information hypothesis predicts an interaction between affective states and the perception of their likely causes.

Supporting this interaction prediction, Schwarz and Clore (1983) observed that the influence of mood on judgments of life satisfaction was eliminated when participants attributed their current feelings either correctly or incorrectly to a transient source. For example, participants reported higher life satisfaction, and a more elated current mood, in telephone interviews when called on sunny rather than rainy days. This difference was eliminated when the interviewer mentioned the weather as part of a private aside, thus directing participants' attention to this source of their feelings. Similarly, recalling a sad life event did not influence participants'

judgments of life satisfaction when they could misattribute the resulting sad feelings to the alleged impact of the experimental room. In addition, current mood, as assessed at the end of each experiment, was more strongly correlated with judgments of life satisfaction when participants' attention was *not* directed to a transient source of their feelings than when it was. Conceptual replications of these attributional effects have been reported by Gorn, Goldberg, and Basu (1993), Keltner, Locke, and Audrain (1993), Savitsky et al. (1998), Schwarz, Servay, and Kumpf (1985), and Siemer and Reisenzein (1998), among others.

Further highlighting that people assess the informational value of their feelings, Avnet and Pham (2004) manipulated participants' perception of the extent to which they can trust their feelings. As expected, induced moods influenced evaluative judgments more when participants were primed to trust rather than distrust their feelings. Finally, augmentation and discounting effects are more reliably obtained under the systematic processing strategy fostered by negative moods (Schwarz & Clore, 1983), which prompts more elaborate causal reasoning (Bohner et al., 1988).

Perceived Relevance

Even when we perceive our feelings as informative, the information they provide may seem more germane to some judgments than to others. For example, Pham (1998) observed more pronounced mood effects when participants evaluated activities with experiential rather than instrumental goals in mind (see also Adaval, 2001; Yeung & Wyer, 2004). He concluded (Pham, 2004, p. 366) that we consider our feelings more relevant “for assessing the potential fulfillment of experiential goals (e.g., ‘Would I have fun at this movie?’) than for assessing the potential fulfillment of instrumental goals (e.g., ‘Would seeing this movie help me for the project?’).” Similarly, we consider our feelings more relevant when judging our own preferences than when judging the preferences of others. Accordingly, Raghunathan and Pham (1999) found stronger mood effects when individuals made decisions for themselves rather than for others.

Finally, people are less likely to rely on their moods when they have high expertise in the domain of judgment (e.g., Ottati & Isbell, 1996; Sedikides, 1995). High expertise presumably facilitates the assessment of the relevance of one's feelings and renders other, relatively more diagnostic, inputs easily accessible. Conversely, being under time pressure increases reliance on one's feelings (Siemer & Reisenzein, 1998), presumably because it interferes with relevance assessments and the search for alternative inputs.

In sum, the use of feelings as information follows the same principles as the use of other information (Feldman & Lynch, 1988): We only rely on them when their informational value is not discredited and when they seem relevant to the judgment at hand. Moreover, their impact decreases when other, more relevant, inputs are accessible.

Feeling vs. Content

According to mood-congruent recall models, the impact of moods should increase when the mood induction is thematically related to the target judgment. Suppose, for example, that a depressed mood is induced by thoughts about a serious illness. If so, the valence of the mood *and* the content of the mood induction should facilitate the recall of illness related material from memory (e.g., Bower, 1981). Hence, illness related judgments should be more likely to show mood effects than judgments pertaining to other content domains. Empirically, this is not the case (e.g., Johnson & Tversky, 1983; Mayer, Gaschke, Braverman, & Evans, 1992).

For example, Johnson and Tversky (1983) observed that reading descriptions of negative events, which presumably induced a depressed and slightly anxious mood, increased judgments of risk. This effect was independent of the object of judgment or the content by which the mood was induced. Reading about cancer, for example, affected judgments of the risk of cancer, but had equally strong effects on judgments of the risk of accidents and divorce. Such generalized effects, undiminished over dissimilar content domains, are incompatible with models of mood congruent recall. However, they are consistent with the feelings-as-information hypothesis. From this perspective, participants inferred higher risk from their depressed and anxious feelings, thus simplifying an otherwise difficult task (for an extended discussion of the role of feelings in judgments of risk see Loewenstein, Weber, Hsee, & Welch, 2001).

In addition, other researchers observed mood effects on evaluative judgments in the absence of any evidence for mood effects on the recall of relevant information from memory (e.g., Fiedler, Pampe, & Scherf, 1986). More fundamentally, a general review of the mood and memory literature (Wyer, et al., 1999) suggests that most instances of mood-congruent recall in the literature are ambiguous as to whether they result from mood per se or from the inadvertent activation of mood-relevant concepts. Most mood induction procedures involve the activation of positive and negative concepts as well as of positive and negative feelings, raising the possibility that mood congruent recall may often be concept congruent recall.

Mood-incongruent Judgments

When we ask ourselves, “How do I feel about it?”, our happy or sad moods convey that we feel good or bad about whatever the “it” is. In most cases, this results in mood-congruent judgments, as in the above examples. Nevertheless, mood-incongruent judgments can be observed under specific conditions.

First, suppose you are asked to read a sad story and to evaluate how successful it is at making you feel sad. If you find yourself happy after reading the story, you are likely to conclude that it was a poor sad story – a condition under which positive feelings result in a negative judgment. Empirically this is the case, as Martin and colleagues (1997) demonstrated. In our reading, such findings reflect changes in the criterion of judgment rather than changes in the information conveyed by the mood.

Second, mood incongruent judgments can result from the logic of discounting effects themselves (e.g., Isbell & Wyer, 1999; Ottati & Isbell, 1996). Suppose that you are evaluating a job candidate but are aware that you’ve been in a miserable mood all day due to an earlier event. How much of your negative affect reflects your reaction to the candidate and how much is due to the earlier event? If you fully attribute your bad feelings to the earlier event, you may arrive at an unduly positive assessment of the candidate. Empirically, attempts to correct for a perceived influence often result in overcorrections of this type (Strack & Hannover, 1996; Wilson & Brekke, 1994), unless the person can draw on other accessible inputs as an alternative route to judgment. Accordingly, (mis)attribution manipulations may eliminate mood effects when diagnostic alternative inputs are available, but may foster overcorrection, and hence mood-incongruent judgments, when they are not.

Finally, mood inducing events can elicit contrast effects in the evaluation of closely related targets by serving as extreme standards of comparison. For example, Schwarz et al. (1987) induced happy or sad moods by conducting an experiment in a very pleasant or unpleasant room. Consistent with the induced moods, their student participants reported higher life-satisfaction in the pleasant than unpleasant room. When asked to report their housing-satisfaction, however, this pattern reversed, presumably because even modest dorm rooms seemed luxurious compared to the salient standard introduced by the unpleasant room. Theoretically, such comparison-based contrast effects should be limited to judgments for which the mood inducing event can serve as a highly relevant standard.

Specific Emotions

The general logic outlined for moods also applies to the use of specific emotions as a source of information. For example, Schwarz et al. (1985) observed that the impact of a fear arousing communication on participants' attitudes was eliminated when participants attributed their subjective experience to the arousing side-effects of a pill, but was enhanced when they assumed the pill would have tranquilizing effects. However, the informational value of specific emotions differs from the informational value of global moods in two important ways.

First, emotions are specific reactions to specific events, whereas moods are of a diffuse and unfocused nature (Morris, 1989). Because of their unfocused nature, moods can be misread as a response to wide range of different targets – but once we attribute the mood to specific cause, its impact on unrelated judgments vanishes (Schwarz & Clore, 1983). In contrast, the source of a specific emotion is more likely to be in the focus of attention from the onset, thus limiting the emotion's informational value for unrelated judgments. Accordingly, Keltner, Locke, et al. (1993) observed that having participants label their current feelings with specific emotion terms was as efficient in eliminating mood effects on subsequent judgments as a standard misattribution manipulation. Their findings are also an important methodological warning: using specific emotion terms as manipulation checks invites causal attributions to determine the specific emotion, which can eliminate the expected effect.

Second, emotions reflect an underlying appraisal (e.g., Ortony et al., 1988; Ellsworth & Scherer, 2003) and the experience of a specific emotion implies that a specific set of appraisal criteria has been met. Anger, for example, informs us that somebody did us wrong and hence provides more specific information than a diffuse negative mood. If so, different emotions of the same valence should have differential effects, which can be predicted on the basis of the underlying appraisals (e.g., Lerner & Keltner, 2000). A growing body of literature supports this reasoning.

In an early study, Gallagher and Clore (1985) showed that feelings of fear affected judgments of risk but not of blame, whereas feelings of anger affected judgments of blame but not of risk. Similarly, Lerner et al. (2004) observed in a national survey during the immediate aftermath of the terrorist attacks of September 11, 2001, that inducing participants to focus on the experienced fear increased risk estimates and plans for precautionary behavior, whereas focusing on the experienced anger did the reverse. Studying attributions of responsibility, Keltner, Ellsworth, et

al. (1993) observed that angry participants assigned more responsibility to human agents than to impersonal circumstances, whereas sad participants assigned more responsibility to impersonal circumstances than to human agents, again consistent with the underlying appraisal patterns. Using a minimal group paradigm, DeSteno and colleagues (2004) found that anger elicited more negative automatic evaluations of the outgroup, whereas sadness did not affect outgroup evaluations relative to a neutral mood control.

Going beyond judgment effects, several studies documented effects of emotions on goal oriented behavior. Raghunathan and Pham (1999) suggested that sadness, a common response to the loss or absence of a reward, may prompt the goal of reward acquisition; in contrast, anxiety, a response to threats, may prompt a goal of uncertainty reduction. To test these predictions, they provided sad or anxious participants with a choice that required a trade-off between risk and rewards. As expected, sad individuals pursued reward acquisition and preferred high reward options, even though they came at the cost of high risk. Conversely, anxious individuals pursued uncertainty reduction and preferred low risk options, even though they came at the cost of low reward. Similarly, Lerner and colleagues (2004) showed that induced disgust and sadness can affect economic decisions. Compared to a neutral emotion condition, disgusted participants sold goods they owned at a lower price, and offered less money to acquire new goods, presumably because disgust prompts “expel” and “intake avoidance” goals. Sad participants, on the other hand, offered more money to acquire goods, consistent with Raghunathan and Pham’s (1999) observation that sadness motivates reward acquisition; however, they also sold what they had at a lower price, in contrast to what this account would predict. Lerner and colleagues (2004) attribute both findings to participants’ desire to change their sad circumstances, which would motivate pricing decisions that facilitate the sale of what one owns and the acquisition of what one wants.

In combination, these findings indicate that specific emotions influence judgments in ways that are consistent with the underlying appraisals. Moreover, emotions give rise to specific goals, which influence subsequent behavior. Attributing the emotion to an unrelated event would presumably eliminate these effects (e.g., Schwarz et al., 1985).

Bodily Sensations

The research on mood and emotions indicates that incidental feelings influence judgment

only when the nature of the feelings, the salience of their causes, or other aspects of the situation allow them to be experienced as reactions to the target of judgment. The available research suggests that this conclusion also applies to bodily sensations.

Arousal States

Exploring the impact of heightened excitation levels, Zillman (1978) had participants engage in various forms of exercise. Shortly after the exercise, no impact of increased excitation level was observed, presumably because participants were still aware of its source. After some delay, however, subsequent judgments were affected by the residual arousal. Apparently, participants misinterpreted their arousal as a reaction to the target, once the temporal distance of the exercise rendered this alternative source less accessible and plausible. Similarly, Zanna and Cooper (1976) observed in their classic misattribution experiments that cognitive dissonance effects were eliminated when participants could attribute the resulting arousal state to some other source.

These lines of research indicate that individuals draw on their perceived arousal state as a source of information, unless its informational value is called into question, as we have seen for other feelings. Moreover, apparent "excitation" effects can be obtained in the absence of any actual arousal, based on false feedback (e.g., Valins, 1974). This is incompatible with the assumption that some actual arousal needs to be present to be "transferred" (Zillman, 1978) and highlights the informational value of *perceived* arousal as the crucial ingredient.

Facial Feedback

Darwin (1872/1965) noted that "most of our emotions are so closely connected with their expression that they hardly exist if the body remains passive" (p. 257). Taking a more extreme view, James (1890) maintained that emotions were, in fact, nothing more than the awareness of our expressions: "We feel sorry because we cry, angry because we strike, and afraid because we tremble" (p. 243). Experimental research provided some support for the assumption that emotional expressions may elicit distinctive emotional experiences. For example, Ekman, Levenson, and Friesen (1983) found that posing different facial expressions of emotion triggered different patterns of autonomic activity (e.g., changes in heart rate, skin temperature, and skin conductance). Hence, the impact of facial expressions on judgment may involve autonomic activity as well as proprioceptive feedback.

For example, Keltner, Ellsworth, et al. (1993) induced participants to take on a sad or angry

facial expression, without labeling the expression in emotion terms. These expressions affected attributions of responsibility in the same way previously discussed for recall-induced sadness and anger. In fact, the influence of facial expressions alone was larger than the influence of facial expressions combined with an emotional recall task, perhaps because the influence of the expression itself was less transparent. Using a particularly subtle manipulation, Strack, Martin, and Stepper (1988) had participants rate the funniness of cartoons while holding a pen in their mouths in such a manner that a smile was either facilitated or inhibited. Holding a pen between one's teeth requires that one contract the same muscles that are used when one smiles, while holding a pen between one's lips results in pursing the lips, rendering a smile impossible. As expected, participants reported greater amusement at the cartoons when the muscle contractions resembled rather than inhibited a smile. Stepper and Strack (1993) further showed that such processes are not limited to facial feedback. Their participants reported higher pride when they received positive performance feedback in an upright posture rather than a slumped posture.

As observed for moods and emotions, the impact of emotional expressions can be discounted and augmented by suitable attributional manipulations (Olson & Roese, 1995). Moreover, bodily experiences are perceived as a response to whatever is in the focus of one's attention, rendering their influence more context dependent than has often been assumed. For example, Tamir and colleagues (2004) observed that brow (vs. cheek) tension reduced preferences in an easy judgment context, but increased preferences in a difficult context. Similarly, head shaking (vs. nodding) either increased or decreased prosocial affect, depending on the context in which the judged character was presented. Finally, a subliminal smile (vs. frown) led to higher self-ratings of performance when paired with one's own actions but to lower self-ratings of performance when paired with a competitor's actions.

Other research documented effects of bodily sensations beyond the affective domain. For example, contracting the corrugator muscle elicits a feeling of effort that can affect judgment in ways that parallel the effect of difficulty of recall or thought generation (e.g., Stepper & Strack, 1993; Sanna, Schwarz, & Small, 2002). Similarly, arm flexion and arm extension can provide approach and avoidance feedback that influences processing style in ways that parallel the influence of happy and sad moods (e.g., Friedman & Förster, 2000). We address these findings in the respective sections below.

Cognitive Experiences

The same principles hold for metacognitive experiences, which only influence individuals' judgments if their informational value is not called into question.

Accessibility Experiences

According to most models of judgment, we should evaluate an object more favorably when we bring many rather than few positive attributes to mind; similarly, we should consider an event more likely when we generate many rather than few reasons for its occurrence. Empirically, this is often *not* the case (e.g., Sanna, et al., 2002a,b; Wänke, Bohner, & Jurkowitch, 1997). Recalling many attributes or generating many reasons is more difficult than recalling or generating only a few and these metacognitive accessibility experiences are informative in their own right. What people conclude from them is more malleable than the conclusions drawn from moods and emotions and depends on which of many naïve theories of mental functioning they apply (Schwarz, 2004).

The accessibility-frequency link. One naïve theory links recall experiences to characteristics of the external world and holds, “The more exemplars exist, the easier it is to bring some to mind.” This correct belief is at the heart of Tversky and Kahneman’s (1973) availability heuristic and people infer higher frequency and probability when examples are easy rather than difficult to bring to mind. Because frequent exemplars are also more typical for their category, ease of recall further suggests high typicality. Accordingly, people infer that they use their bicycles more often after recalling few rather than many instances (Aarts & Dijksterhuis, 1999); rate themselves as more assertive after recalling few rather than many of their own assertive behaviors (Schwarz et al., 1991); and hold an attitude with more confidence after generating few rather than many supporting arguments (Haddock et al., 1999).

When people apply this naïve theory, their inferences are consistent with the implications of *what* comes to mind when recall or thought generation is experienced as easy, but opposite to these implications when it is experienced as difficult. These effects can not be traced to differences in the quality of the recalled examples, but are eliminated when the subjective experience is misattributed to an external influence. In the latter case, participants draw on accessible content, reversing the otherwise observed pattern (e.g., Haddock et al., 1999; Sanna, et al., 2002a; Schwarz et al., 1991). Moreover, yoked participants, who merely read the thoughts generated by another and are hence deprived of the generation experience, are more influenced

when their partner lists many rather than few arguments, in contrast to the person who lists them (e.g., Wänke, Bless, & Biller, 1996). Finally, the same effect can be observed when all participants list the same number of thoughts and their subjective experience of difficulty is manipulated through facial feedback in the form of corrugator contraction, an expression associated with mental effort (e.g., Stepper & Strack, 1993; Sanna et al., 2002a). Thus, merely furrowing one's brow can be sufficient to arrive at conclusions that are opposite to the content of one's thoughts.

Experienced difficulty of thought generation can thwart the success of popular debiasing strategies, which encourage people to guard against overconfidence, hindsight bias and similar fallacies by thinking about counterfactual alternatives. Such strategies only work when generating counterfactuals is experienced as easy, but backfire when it is experienced as difficult (Sanna & Schwarz, 2004).

Other naïve theories. While the accessibility-frequency link has received most attention, people hold a variety of other naïve theories about memory and thought generation, rendering the inferences from accessibility experiences highly malleable (for a review see Schwarz, 2004). For example, they correctly assume that details of recent events are easier to recall than details of distant events, and details of important events easier than details of unimportant ones. Which of these theories they apply depends on the task posed. Xu and Schwarz (2005) had participants recall details of the Oklahoma City bombing. When first asked to date the event, participants inferred that it was more recent after recalling two rather than ten details; when first asked how important the event was to them at the time, they inferred higher importance after recalling two rather than ten details. More important, application of a given theory entails an attribution of the experience to a specific cause (here, recency or importance), which can change the implications of the experience for subsequent judgments (Schwarz, 2004). Hence, participants who initially attributed the difficulty of recalling many details to the event's temporal distance subsequently reported that the event was quite important to them – presumably because they could still recall details even though the event had apparently happened long ago. Conversely, participants who initially attributed difficulty of recall to low personal importance subsequently dated the event as closer in time – presumably because they could still recall details despite the event's low personal importance.

Processing motivation. Finally, people are more likely to rely on their accessibility

experiences under conditions that commonly foster heuristic processing, but turn to accessible content under conditions that commonly foster systematic processing. Rothman and Schwarz (1998) asked men to recall few or many behaviors that increase or decrease their risk of heart disease. Men without a family history of heart disease relied on their accessibility experiences and inferred *higher* risk after recalling few risk-increasing or many risk-decreasing behaviors. In contrast, men with a family history relied on recalled content and inferred *lower* risk under these conditions. Apparently, the personal relevance of the task, indicated by their family history, influenced the processing strategy used (see also Grayson & Schwarz, 1999). Similarly, Ruder and Bless (2003) observed that being in a good mood, a condition that fosters heuristic processing as reviewed below, increased reliance on accessibility experiences. Conversely, being in a sad mood, a condition that fosters systematic processing, increased reliance on recalled content.

In combination, these findings challenge the widely shared assumption that we can predict people's judgments by knowing *what* comes to mind. Unless we take the person's metacognitive experiences, relevant naïve theories and processing motivation into account, our predictions will often be erroneous (Schwarz, 2004).

Processing Fluency

Numerous variables can influence the fluency with which new information can be processed, ranging from visual characteristics of the presentation (like figure-ground contrast or print font) to the semantic relatedness of the material and the frequency and recency of previous exposure. Because these variables result in similar phenomenological experiences of fluent processing, the meaning of the experience is open to interpretation. Which interpretation people choose, and which inferences they draw, again depends on the naïve theory they bring to bear. Applicable theories are recruited by the task and application of one theory usually renders the experience uninformative for inferences that require a different theory (Schwarz, 2004).

Some naïve theories pertain to presentation conditions; people assume that material is easier to process when shown for long rather than short durations, with high rather than low clarity, and so on. Other theories pertain to one's state of knowledge; people assume, for example, that familiar material is easier to process than unfamiliar material. When fluency deriving from one's state of knowledge is brought to bear on judgments of presentation characteristics, it results in *illusions of perception*. Thus, people infer that a stimulus was presented for a longer duration, or

with higher clarity, when it is easy to process due to earlier exposures (e.g., Witherspoon & Allan, 1985; Whittlesea, Jacoby & Girard, 1990). Conversely, when fluency deriving from favorable presentation conditions is brought to bear on judgments of one's knowledge, it results in *illusions of memory* and people erroneously infer that the stimulus is familiar (e.g., Whittlesea et al., 1990), resulting in false recognition judgments.

Even when processing fluency is due to previous exposure, and correctly attributed to this source, it may result in erroneous judgments when perceivers misidentify the specific instance of exposure. For example, learning the names of non-famous individuals in an experimental session may later result in erroneous judgments of fame when one of the names seems familiar and one can not recall the context in which it was initially encountered (e.g., Jacoby, et al., 1989). As in the case of accessibility experiences, bodily sensations that convey mental effort can mirror low fluency. Strack and Neumann (2000) observed in a conceptual replication of Jacoby et al.'s (1989) fame study that contracting the corrugator muscle can protect against illusions of fame, presumably by conveying low fluency. Finally, the impact of fluency experiences is eliminated when people (mis)attribute fluency to an unrelated source (for a review see Kelley & Rhodes, 2002), as observed for other feelings.

Several consequences of fluency are of particular interest to social psychologists. First, fluency affects *judgments of truth*. Presumably, the sense of familiarity that arises from high fluency suggests that one has heard the statement before, which may serve as a consensus cue – if many people believe it, there's probably something to it. This is most apparent when fluency results from repeated exposure and numerous studies obtained robust “illusions of truth” under these conditions (e.g., Begg, Anas, & Farinacci, 1992; Hasher, Goldstein, & Toppino, 1977). After some delay, illusions of truth can even emerge when the statement is explicitly marked as “false” (e.g., Skurnik et al., 2005). This poses major problems for education campaigns and rumor control, as Allport and Lepkin (1945) noted decades ago: Corrections of false information often entail a reiteration of the false statement, thus increasing its fluency and later acceptance. More surprisingly, simply presenting statements with good figure-ground contrast (Reber & Schwarz, 1999), or in a rhyming form (McGlone & Tofigbakhsh, 2000), is sufficient to increase their acceptance as true. This suggests that any variable that increases fluency may also increase perceived truth.

Second, fluency affects judgments of *liking, preference, and beauty*. As Zajonc (1968)

demonstrated, repeated exposure to an initially neutral stimulus, without any reinforcement, leads to gradual increases in liking (for a review see Bornstein, 1989). Several authors suggested that this mere exposure effect may be due to increased fluency (e.g., Seamon, Brody & Kauff, 1983). Supporting this hypothesis, a growing body of findings indicates that *any* variable that facilitates fluent processing increases liking, even under conditions of a single exposure. For example, people like the same stimulus more when it is preceded by a visual (Reber, Winkielman, & Schwarz, 1998) or semantic (Winkielman et al, 2003) prime that facilitates fluent processing, and less when it is preceded by primes that impede fluent processing. In fact, the influence of many variables long known to affect liking and aesthetic preference, from figure-ground contrast to symmetry and prototypicality, can be traced to increased processing fluency (Reber, Schwarz, & Winkielman, 2004).

The available evidence suggests that fluency itself is hedonically marked and elicits a positive affective response that can be captured with psychophysiological measures (Winkielman & Cacioppo, 2001). This affective response presumably mediates the effect of fluency on preference judgments. Supporting this assumption, Winkielman and Fazendeiro (reported in Winkielman et al., 2003) observed that the influence of fluency on liking was eliminated when participants misattributed their positive affect to music played in the background. What is less clear is *why* processing fluency is experienced as affectively positive. Relevant proposals range from the adaptive value of a preference for familiar stimuli (Zajonc, 1968; Freitas, et al., 2005) to the adaptive value of fast stimulus identification (Winkielman, Schwarz, & Nowak, 2002).

The parallel effects of processing fluency on judgments of truth and aesthetic preference also shed new light on Keats's famous assertion that “beauty is truth, truth is beauty” – both judgments are based, in part, on the same experiential information. Moreover, the relationship between familiarity and affective response is bi-directional. Stimuli that evoke positive affect also seem more familiar, even when processing fluency is controlled for (Monin, 2003), as do novel arguments when people are in elated moods (Garcia-Marques & Mackie, 2001). Once again, the single window we have on our subjective experiences makes it difficult to distinguish between commonly related experiences and facilitates misattributions.

Priming as a Misattribution Process

The same attribution logic holds for our thoughts (Clore, 1992; Clore & Colcombe, 2003). We usually assume that the thoughts that come to mind are “about” whatever we are thinking

about (Higgins, 1998) – or why else would they come to mind now? When we are aware that our thoughts may have been prompted by an unrelated influence, we discount them as a source of information. Hence, priming procedures work best when they are subtle and embedded in other tasks (e.g., Higgins, Rholes, & Jones, 1977), allowing us to misread the primed thoughts as a response to the target. But priming manipulations backfire when they are blatant (e.g., Martin, 1986) or participants' attention is drawn to them (e.g., Strack, et al., 1993), making people aware that their thoughts may not be “about” the target. In these cases, people attempt to correct for the perceived influence, often resulting in overcorrection (Strack & Hannover, 1996; Wilson & Brekke, 1994). This experiential perspective on the influence of thought content blurs the lines between the experiential and cognitive accounts described above. It suggests, for example, that even if judgment effects were to involve mood-congruent recall from memory, they might be attenuated or eliminated if people became aware that these thoughts had come to mind only because they were in a good or bad mood.

Summary

In sum, people assume that their thoughts and feelings are “about” what is in the focus of their attention. They draw on their apparent responses to the target as relevant information, unless they are aware that their experiences may be due to another source. In the latter case, they may attempt to correct for their likely influence; this often results in theory-driven overcorrection, unless alternative diagnostic inputs are available. Reliance on one's affective feelings is particularly likely when the judgment is affective in nature (e.g., preference or well-being), which often renders one's feelings the most diagnostic source of information available; when little other information is accessible; when the judgment is overly complex and cumbersome to make on the basis of a piecemeal information processing strategy; or when time constraints or competing task demands limit the attention that may be devoted to evaluating the informational value of one's feelings or to searching for alternative inputs. The same logic applies to specific emotions, bodily sensations and metacognitive experiences, with the qualifications noted above. Hence, forming judgments on the basis of one's feelings may sometimes be thought of as a simplifying heuristic strategy. Note, however, that this strategy entails assessments of the informational value of one's feelings and of their relevance to the task at hand, as well as the use of naïve theories as inference rules.

The feelings-as-information approach provides a parsimonious and unifying framework for conceptualizing the influence of a wide variety of phenomenological experiences; it is the only available conceptualization for the influence of cognitive experiences. Moreover, its predictions are consistent with the bulk of the evidence. Obviously, this supportive evidence, by itself, does not rule out other pathways of influence. This issue is particularly contentious for the influence of moods, which other researchers are inclined to attribute primarily to mood-congruent recall (for extensive reviews see Forgas, 1995a, 2001, 2003). Mood-congruent recall could, in principle, provide a plausible pathway for mood effects on judgment even under conditions where the feeling itself is discredited as a source of information and people engage in an effortful, piece-meal judgment strategy. However, in the absence of (mis)attribution manipulations that discredit the informational value of participants' current feelings, it is difficult to determine which process drives a particular instance of mood effects on evaluative judgment.

FEELINGS AND STRATEGIES OF INFORMATION PROCESSING

Numerous findings indicate that feelings may influence individuals' spontaneous adoption of heuristic or systematic strategies of information processing. While the evidence is uncontroversial, there is less agreement on the underlying process. Moreover, most of the conceptualizations focus on the influence of happy or sad moods. One approach attributes affect-induced differences in processing strategy to differences in attentional resources, although some researchers assume that negative moods limit resources (e.g., Ellis & Ashbrook, 1988), whereas others assume that positive moods do so (e.g., Mackie & Worth, 1989). A second approach attributes differences in processing style to the informational functions of moods. Variants of this approach assume that our feelings inform us either about the state of the environment (Schwarz, 1990; Weary, et al., 1993); the contingency of hedonically relevant rewards (Wegener & Petty, 1994); the progress made in goal pursuit (Clore et al., 2001); or that they serve as input into specific performance decisions (Martin, et al., 1993). A third approach focuses on mood maintenance and repair. It assumes that we protect our pleasant affect by avoiding excessive mental effort when we feel happy (mood maintenance), but engage in effortful thought to distract ourselves and to improve our mood when we feel sad (mood repair; e.g., Clark & Isen, 1982; Erber & Erber, 2001). These different accounts gave rise to a lively debate (see the contributions in Martin & Clore, 2001). However, their exclusive focus on the influence of moods captures

only part of the accumulating evidence. As reviewed below, proprioceptive approach or avoidance feedback (Friedman & Förster, 2000, 2002) is functionally equivalent to being in a happy or sad mood, as are environmental cues, like smiling or frowning faces (Ottati, Terkildsen, & Hubbard, 1997) and even the color of the paper on which a task is presented (Soldat, Sinclair, & Mark, 1997). We therefore attempt to provide an integrative account that captures these commonalities while maintaining core assumptions of previous conceptualizations (presented in Martin & Clore, 2001).

Situated Cognition:

Cognitive Processes are Tuned to Meet Situational Requirements

“My thinking is first and last and always for the sake of my doing,” noted William James (1890, p. 333) more than a century ago. To serve our doing in adaptive ways, our cognitive processes are responsive to the environment in which we pursue our goals, as a growing body of research into situated cognition indicates (see Smith & Semin, 2004). We propose that the adaptively tuned nature of human cognition is at the heart of the observed shifts in processing strategy (Schwarz, 2002). If so, we should observe that external and internal cues that signal a benign and unproblematic environment are functionally equivalent, as are external and internal cues that signal a problematic environment. These signals have cognitive and motivational consequences, which are highly adaptive under most circumstances.

When facing a problematic situation, we are usually motivated to do something about it. Any attempt to change the situation requires a careful assessment of its features, an analysis of their causal links, detailed explorations of possible mechanisms of change and anticipation of the potential outcomes of any action that might be initiated. Consistent with these conjectures, negative affective states are associated with a narrowed focus of attention (e.g., Broadbent, 1971; Easterbrook, 1959) and a higher level of spontaneous causal reasoning (e.g., Bohner, et al., 1988), paralleling the observation that failure to obtain a desired outcome shifts attention to a lower level of abstraction (e.g., Wegner & Vallacher, 1986). These influences foster vigilance and bottom-up, data-driven processing (Bless, 1997; Schwarz, 1990), in particular when the negative feeling entails a high uncertainty appraisal, as is the case for sadness (Tiedens & Linton, 2001). Moreover, it may seem unwise to rely on one's usual routines and preexisting general knowledge structures under these conditions, thus discouraging top-down strategies. Finally, we may be unlikely to take risks in

a situation that is already marked problematic, and may therefore avoid simple heuristics and uncertain solutions.

Conversely, when we face a benign situation that poses no particular problem, we may see little need to engage in detailed analyses and may rely on our usual routines and preexisting knowledge-structures, which have served us well in the past (Bless, 1997; Schwarz, 1990). This encourages less effortful, top-down processing as a default, *unless* current goals require otherwise. In pursuing such goals, we may be willing to take some risk, given that the general situation is considered safe. As a result, we may prefer simple heuristics over more effortful, detail oriented judgmental strategies, may explore new procedures and possibilities and pursue unusual, creative associations.

In combination, these conjectures suggest that our cognitive processes are tuned to meet the situational requirements signaled by our feelings. In contrast to earlier conceptualizations, which pertained exclusively to the influence of moods, this cognitive tuning hypothesis does *not* entail that happy individuals are somehow unable (Mackie & Worth, 1989) or unwilling (Schwarz & Bless, 1991) to engage in systematic processing. Rather, it merely entails that the happy mood *itself* does not signal a situation that poses particular processing requirements. Hence, the spontaneously adopted heuristic processing style and reliance on preexisting knowledge structures should be easy to override, rendering processing under happy moods more flexible than processing under sad moods. In contrast, the systematic processing style fostered by negative moods should be difficult to override, reflecting that it would be maladaptive to ignore a potential “problem” signal (Bless & Schwarz, 1999). Moreover, any variable that can signal a benign or problematic situation should have effects that parallel the influence of happy or sad moods. Finally, specific emotions provide information that goes beyond global benign/problem signals and elicit processing strategies that are specifically tuned to meet the requirements entailed in the underlying appraisal pattern.

The feelings-as-information logic further predicts that feelings should exert no influence on processing style when their informational value is called into question. Empirically this is the case, as Sinclair, Mark, and Clore (1994) and Gasper (2004) observed for the case of moods, in contrast to what other approaches would predict.

This conceptualization does not preclude other influences. Recent negative events, for example, may temporarily preoccupy the person to an extent that interferes with the systematic processing, despite the presence of negative affect (Ellis & Ashbrook, 1988). Similarly, people

may indeed engage in mood repair when they feel bad (Erber & Erber, 2001). But it would be maladaptive to do so at the expense of attention to the causes of one's feelings. Hence, we would expect mood maintenance and repair to take priority only after the person concluded that little could be done or when the laboratory task seems irrelevant to begin with. Also, mood maintenance and repair would be expected when pleasant affect (rather than performance) is a primary goal, as might be expected when experimental instructions suggest so (e.g., Wegener, Petty, & Smith, 1995).

Feelings and Cognitive Performance

We first illustrate the interplay of feelings and task requirements in the choice of processing strategies. Subsequently, we review prototypical findings, highlighting the functional equivalence of different feelings and environmental cues.

Feelings and Task Requirements: Moods, Scripts, and Concentration Tests

If happy moods increase, and sad moods decrease, our tendency to rely on the "usual routines," people should be more likely to rely on an applicable script (Schank & Abelson, 1977) when they are in a happy rather than sad mood. Empirically, this is the case. Employing a dual-task paradigm, Bless, Clore, et al. (1996) had participants listen to a tape-recorded restaurant story that contained script consistent and script inconsistent information. While listening to the story, participants worked on a concentration test that required them to mark certain letters on a work sheet. Good performance on this test requires detail-oriented processing; in contrast, the restaurant story can be understood by engaging *either* in script-driven top-down processing or in data-driven bottom-up processing. As predicted, happy participants were likely to recognize previously heard script inconsistent information, but showed high rates of erroneous recognition of script consistent information – the classic pattern of schema guided memory. Neither of these effects was obtained for sad participants, indicating that they were less likely to draw on the script. Given that top-down processing is less taxing than bottom-up processing, we may further expect that happy participants do better on a secondary task. Confirming this prediction, happy participants outperformed sad participants on the concentration test.

In combination, these findings indicate that moods influence the spontaneously adopted processing style under conditions where different processing styles are compatible with the

individual's goals and task demands, as was the case for comprehending the restaurant story. Under these conditions, sad individuals are likely to spontaneously adopt a systematic, bottom-up strategy, whereas happy individuals rely on a less effortful top-down strategy. But when task demands (as in the case of the above concentration test) or explicit instructions (e.g., Bless et al., 1990) require detail-oriented processing, happy individuals are able and willing to engage in the effort. The latter observation is inconsistent with the proposal that happy moods limit cognitive resources (e.g., Mackie & Worth, 1989), or generally impair processing motivation (e.g., Schwarz & Bless, 1991).

Categorization

The detail-oriented, bottom-up processing style associated with sad moods fosters the formation of fine-grained, narrow categories, whereas the top-down, heuristic processing style associated with happy moods fosters the formation of more inclusive categories (Isen, 1987). Thus, happy participants are more likely to include unusual exemplars in a category than participants in a neutral mood, assigning, for example, “feet” to the category “vehicles” and “cane” to the category “clothing” (Isen & Daubman, 1984). They also list more unusual exemplars when given a category prompt (Hirt, et al., 1997) and match geometric figures on the basis of global rather than local similarities (Gasper & Clore, 2002). Finally, Beukeboom and Semin (in press) observed that sad participants identified behaviors at a lower level of abstractness than happy participants, paralleling the impact of actual obstacles (Wegner & Vallacher, 1986).

Similar effects have been obtained with other manipulations that signal a benign or problematic situation. Using a subtle bodily feedback manipulation, Friedman and Förster (2000, 2002) asked participants to either press their hand downward against the top of the table (arm extension) or upward against the bottom of the table (arm flexion). Arm extension (as in pushing something away) is usually associated with avoidance behavior, whereas arm flexion (as in pulling something closer) is associated with approach behavior. The proprioceptive feedback of the involved muscle activation is sufficient to influence processing style: Relative to a control, participants who flexed their arms provided more inclusive categorizations, whereas those who extended their arms provided less inclusive categorizations.

Creative Problem Solving

As may be expected on the basis of the categorization findings, happy individuals typically outperform sad or neutral-mood individuals on creativity tasks, like the Remote Associates Test

(e.g., Isen, Daubman, & Nowicki, 1987) or Duncker's candle problem (Isen & Daubman, 1984). Again, studies using arm flexion or extension to provide bodily approach/avoidance feedback obtained parallel results (Friedman & Förster, 2000). Participants who flexed their arms were more likely to break the set than participants who extended their arms, resulting in better performance on tests that require the identification of targets hidden in complex visual patterns. Performance on such tasks is facilitated by the application of familiar concepts to the hidden targets, while disregarding irrelevant detail and breaking the set imposed by the distractor – requirements that give top-down processing an advantage over bottom-up processing.

Analytic Reasoning Tasks

If sad moods foster systematic, detail-oriented processing, they should facilitate performance on analytic reasoning tasks. The bulk of the available evidence is consistent with this prediction (see Schwarz & Skurnik, 2003, for a review). For example, Fiedler (1988) reported that sad participants produced fewer inconsistencies in multiattribute decision tasks than happy participants. Specifically, the latter were twice as likely than the former to violate transitivity by producing inconsistent triads of the form $A > B$ and $B > C$, but $A < C$. Similarly, Melton (1995) observed that happy participants performed worse on syllogisms than participants in a neutral mood. Again, the influence of bodily approach/avoidance signals parallels these effects. Using analytical reasoning tasks taken from the Graduate Record Exam, Friedman and Förster (2000) observed that participants who extended their arms (avoidance) solved nearly twice as many problems correctly as participants who flexed their arms (approach).

Finally, external cues can serve the same function. Soldat et al. (1997) presented analytic reasoning tasks, also taken from the Graduate Record Exam, on paper of an upbeat red, or a somewhat depressing blue, hue. Across several replications, participants performed better when the tasks were printed on blue rather than red paper, with white paper falling in between. The performance advantage of blue paper was most pronounced for complex tasks, which posed higher processing demands. Paralleling these laboratory findings, Sinclair, Soldat, and Mark (1998) found that students did better on an exam when printed on blue rather than red paper, in particular for difficult questions.

In contrast to the above findings, mostly based on tasks taken from the GRE, other studies revealed performance deficits under depressed affect on complex logic and mathematics tasks (for a review see Clore et al., 1994). Theoretically, mixed findings are to be expected for such

tasks because none of the hypothesized processes will *necessarily* result in improved performance. For example, greater attention to detail per se will not improve performance when the task requires the application of an unknown algorithm and it may impede performance when the person gets side-tracked by irrelevant details. Similarly, top-down processing strategies may facilitate as well as impede performance, depending on whether the available heuristic is applicable to the current task. It is therefore not surprising that the most consistent findings have been obtained with common social reasoning tasks, like persuasion and impression formation, with which people are highly familiar.

Persuasion

In general, strong arguments are more persuasive than weak arguments when recipients engage in systematic processing, whereas argument strength exerts little influence under heuristic processing (for a review see Petty & Cacioppo, 1986). Accordingly, the impact of argument strength can serve as a diagnostic tool for assessing processing strategy. Studies using this strategy consistently found that happy recipients engage in less, and sad recipients in more, elaboration of counterattitudinal messages than recipients in a non-manipulated mood (e.g., Bless, et al., 1990; see Schwarz, Bless, & Bohner, 1991, for a review). Hence, happy recipients are moderately and equally persuaded by strong as well as weak arguments, whereas sad recipients are strongly persuaded by strong arguments, and not persuaded by weak arguments. Conversely, Worth and Mackie (1987) observed that happy recipients were more likely than sad recipients to rely on heuristic strategies in assessing the validity of the message, paying attention to cues like the communicator's status or expertise in forming a judgment. Consistent with the feelings-as-information logic, these effects are eliminated when recipients are aware that their mood is due to an unrelated source (Sinclair, et al., 1994).

As noted above, however, the impact of moods can be overridden by other variables and explicit instructions to pay attention to the arguments (e.g., Bless et al., 1990), or the promise that carefully thinking about the message would make one feel good (e.g., Wegener, et al., 1995), have been found to elicit systematic message processing in happy recipients. What characterizes the information processing of happy individuals is not a general cognitive or motivational impairment, but a tendency to spontaneously rely on heuristic strategies and general knowledge structures in the absence of goals that require otherwise.

Paralleling the effects of recipients' moods, Ottati et al. (1997) observed that the same message

is less likely to be scrutinized when presented by a communicator with a smiling, happy face than when presented by a communicator with a neutral, somber face. They suggested that the communicator's conveyed affect can serve informative functions that parallel recipients' own affect. Further illustrating the power of environmental affective cues, Soldat and Sinclair (2001) had participants read persuasive messages printed on colored paper. Participants were persuaded by strong arguments, but not by weak arguments, when the message was presented on paper of depressing blue hue. However, both types of arguments were similarly persuasive when the paper had an upbeat red hue.

Stereotyping and Impression Formation

Paralleling the persuasion findings, numerous studies indicate that perceivers in a sad mood are more likely to elaborate individuating information about the target person, whereas perceivers in a happy mood are more likely to draw on the person's category membership as a heuristic cue. This results in more stereotypical judgments under happy than under sad moods (e.g., Bodenhausen, et al., 1994; Isbell, 2004; for a review see Bless, et al., 1996). Related research into the influence of brand names on product evaluations similarly shows higher reliance on brand information under happy than sad moods (e.g., Adaval, 2001). Individual differences in chronic affect parallel these findings. Mildly depressed perceivers attend more to individuating information than non-depressed perceivers (e.g., Edwards & Weary, 1993) and seek more, and more diagnostic, information (Hildebrandt-Saints & Weary, 1989). Finally, happy individuals' reliance on category membership information can again be overridden by manipulations that increase their processing motivation, such as personal accountability for one's judgment (Bodenhausen, et al., 1994) or anticipated interaction with the target person (e.g., Hildebrandt-Saints & Weary, 1989).

Summary

In sum, internal and external cues that signal a benign or problematic situation have cognitive and motivational consequences. Human cognition is tuned to meet situational requirements and problem signals foster vigilance and the adoption of a detail-oriented bottom-up processing style, which is usually adaptive. Signals that characterize the situation as benign, on the other hand, are not, by themselves, associated with particular processing requirements. They foster reliance on pre-existing knowledge structures and top-down processing, *unless* goals

or task demands require otherwise. Which processing strategy facilitates or impedes performance depends on the specific task. The bulk of the evidence is compatible with this framework (Schwarz, 2002), which offers a unified conceptualization of the operation of internal and external signals in the context of situated cognition.

This does not preclude the operation of other pathways under specific conditions. Sometimes people's preoccupation with recent happy or sad events will indeed limit their cognitive resources (Ellis & Ashbrook, 1988; Mackie & Worth, 1991), although it is difficult to separate the impact of affect per se from the impact of event-related thoughts. Other times, people will indeed attempt to focus on something else to improve a bad mood (e.g., Wegener, et al., 1995), or avoid mental effort to maintain a good mood (e.g., Clark & Isen, 1982), although dealing with current problems will probably take precedence in naturalistic contexts. Similarly, moods may serve as input into specific performance decisions (Martin, 2001) and may influence which material comes to mind when we work on a problem (Forgas, 2001). None of these mood related processes, however, is sufficiently general to account for the observed parallel effects of affective, bodily, and cognitive cues that signal a benign or problematic environment.

Finally, we note that the reviewed findings provide little support for assumptions that positive feelings will have mostly "positive" effects (Fredrickson, 2001). Instead, their effect depends on the specific task at hand and positive feelings can facilitate positive outcomes (like increased creativity or resiliency; see Fredrickson, 2001) as well as negative ones (like increased stereotyping and impaired logical problem solving), in contrast to what positive psychologists seem to hope for.

FEELINGS AND MEMORY

Historically, conscious experiences that accompany the process of remembering played an important role in the study of memory, until they went out of fashion with the behaviorist revolution (for reviews see Brewer, 1992; Roediger, 1996). Over the last two decades, cognitive psychologists have begun to correct the resulting pervasive "neglect of conscious experience" (Tulving, 1989, p. 4) by rediscovering some of the historic themes. This rediscovery is part of a shift from a quantity-oriented "storehouse" metaphor of memory to an accuracy-oriented "correspondence" metaphor of memory (Koriat, Goldsmith, & Pansky, 2000). The storehouse metaphor is exemplified by the list-learning paradigm, with a focus on how many previously

learned items can be recovered. Within this metaphor, the role of subjective experiences is conceptualized in terms of a storage architecture, as illustrated by Bower's (1981) model that treats moods and emotions as nodes in a network. The correspondence metaphor treats memory as a "perception of the past" and focuses on whether "this perception is veridical or illusory" (Koriat et al., 2000, p. 484). Inference processes play a key role in this approach. They can be intuitive or analytic, paralleling dual-process distinctions in social cognition, and based on phenomenal experiences that accompany the remembering process as well as other information. For example, the source monitoring approach (Johnson, Hashtroudi, & Lindsay, 1993) assumes that remembering includes inferences about the source of the memories that come to mind, which are based on their phenomenal qualities. From this perspective, all memory failures (except omissions) are based on a failure of source monitoring, i.e., an inferential process. Cognitive experiences in the form of perceptual and conceptual fluency are central to Jacoby and Kelley's (e.g., 1998) attributional approach to memory, which "conceives of remembering as a combination of fluent processing of an event with the mental set that attributes the fluency to past experience" (Roediger, 1996, p. 88).

To date, research into the role of cognitive experiences in memory has almost exclusively taken an approach that is consistent with the feelings-as-information logic. In contrast, research into the role of moods and emotions in memory has mostly been guided by the architectural assumptions of Bower's (1981) network model and has paid little attention to inferential processes, which figure more prominently in judgment research. Next, we review prototypical findings.

Cognitive Experiences

In our review of fluency effects in judgment, we noted that fluency due to one's state of knowledge can result in perceptual illusions when applied to judgments about the presentation of material. Conversely, fluency due to the conditions of presentation can result in memory illusions when applied to judgments of one's knowledge (for reviews see Kelley & Rhodes, 2002; Koriat et al., 2000). For example, in *recognition* tests, people are more likely to identify a new stimulus as old when its processing is facilitated by a preceding prime (e.g., Jacoby & Whitehouse, 1989), higher visual clarity of the presentation (e.g., Whittlesea et al., 1990), or a highly related semantic context (Whittlesea, 1993). Paralleling effects observed in judgments of truth and beauty, Rhodes and Kelley (2003) also observed erroneous recognition when the test

items were preceded by a rhyming rather than non-rhyming prime. Such enhanced fluency from an unrecognized source presumably also underlies *déjà vu* experiences, where something new seems strangely familiar (Jacoby & Whitehouse, 1989). The observation that bodily sensations of effort can affect fluency-based fame judgments (Strack & Neumann, 2000) further suggests that bodily feedback may also influence recognition, although relevant data are not yet available. Finally, fluency effects on recognition and feelings of familiarity are not obtained when participants attribute fluency to a source other than previous exposure, e.g. because they are aware of the prime (Jacoby & Whitehouse, 1989) or realize that clarity of presentation is being manipulated (Whittlesea et al., 1990).

Models that focus solely on *what* comes to mind can not account for the reviewed phenomena, nor for related research into feelings of knowing and judgments of learning (for a review see Koriat & Levy-Sadot, 1999). At the same time, it is apparent that the experiential approach is relatively silent with regard to *what* comes to mind and instead focuses on the conditions under which we consider whatever comes to mind a reflection of past events.

Mood

Moods may influence memory at the encoding as well as retrieval stage. Extending the investigation of mood effects on processing style, Storbeck and Clore (2005) demonstrated that happy participants are more likely than sad participants to produce false memories. Drawing on Roediger and McDermott's (1995) paradigm, they presented participants with lists of words (e.g., bed, pillow, rest, etc.) that are highly associated to a critical lure (e.g., sleep). Participants typically recall having seen the critical lures, even though they were never presented. This effect depends on engaging in gist processing (in addition to item-specific processing), and is hence more pronounced under happy than sad moods, reflecting the differences in processing style discussed above. Additional manipulations located this effect at the encoding rather than at retrieval stage, as theoretically expected.

The lion's share of research into mood and memory, however, has addressed mood effects on recall in the context of Bower's (1981) model, reviewed earlier. This model predicts that material learned while in a given affective state should be better recalled when in the same rather than a different state. Support for this *state-dependent recall* hypothesis has been obtained in several studies that used a "two-list interference paradigm", where List A is learned while in a happy, and List B is learned while in a sad mood. Being in the same mood at the time of recall

facilitated recall in several studies, whereas being in the opposite mood inhibited recall (e.g., Bower, Monteiro, & Gilligan, 1978; Schare, Lisman, & Spear, 1984). However, other studies (e.g., Bower & Mayer, 1985; Marshall-Garcia & Beck, 1985) failed to replicate this pattern, even when using the same materials. Bower and Mayer (1985, p. 42) concluded from their own non-replications that "mood-dependent retrieval is an evanescent will-o'-the-wisp, and not the robust outcome suggested by earlier reports."

A second prediction holds that positive moods facilitate recall of positively valenced material, and inhibit recall of negatively valenced material; the reverse is expected for negative moods. Note that this *mood-congruency* prediction pertains to the match of mood at recall and valence of the to-be-recalled material, independent of the mood at the time of learning. Unfortunately, the conceptually straightforward distinction between state dependency and mood congruency is difficult to sustain in the domain that produced the most supportive findings, namely the recall of autobiographical information (for reviews see Blaney, 1986; Morris, 1989; Singer & Salovey, 1988), as discussed earlier. In addition, mood congruency may be limited to relatively unstructured material and tends to be difficult to find when positive and negative elements are closely interconnected in a narrative (Mecklenbräuer & Hager, 1984; Hasher, et al., 1985), consistent with the logic of network models.

Empirically, participants' recall often shows a marked asymmetry (e.g., Natale & Hantas, 1982; see Blaney, 1986; Singer & Salovey, 1988, for reviews). Participants in a happy mood recall more happy, and fewer sad, memories than participants in a neutral mood, indicating facilitative as well as inhibitive effects of happy moods. In contrast, sad participants recall fewer happy events, but not more sad events, suggesting inhibitive but not facilitative effects of sad moods. Three different accounts have been offered for this asymmetry. One proposal holds that positive material is more interconnected in memory than negative material (e.g., Isen, 1984; Matlin & Stang, 1979). If so, a given mood-related association would spread to a larger amount of similarly valenced material under positive rather than negative moods. However, data bearing directly on these structural assumptions are not available. Moreover, others (e.g., Higgins, Van Hook, & Dorfman, 1988) proposed that negative events are more likely to be interconnected in memory, given that they elicit more explanatory activity (Bohner et al., 1988). A second proposal attributes the observed asymmetry to mood repair efforts (Clark & Isen, 1982). According to this hypothesis, sad participants attempt to improve their mood by avoiding further

negative thoughts. One might expect, however, that recalling happy memories is an even more effective strategy for mood repair, yet such mood-incongruent recall is rarely observed (for an exception see Parrott & Sabini, 1990, who found mood-incongruent recall under happy as well as sad moods, in contrast to what the mood repair logic would predict).

As a third possibility, Schnall, Clore and Werther (2005) suggested that the usually obtained asymmetry may be due to mood induced differences in processing style. Using the original materials of Bower et al. (1981), they crossed happy and sad moods with positive and negative conceptual primes. They observed that happy participants used the primes in recall, regardless of whether they were positive or negative, whereas sad participants did not. Given that happy moods are usually induced by positive conceptual content (either as a function of the mood manipulation or a naturally occurring event), reliance on this accessible conceptual content as a recall cue would produce a pattern of content-congruent recall that looks like mood-congruent recall. Because sad moods promote item-specific processing and discourage reliance on other accessible content, less congruency would be observed under this condition, fostering the familiar asymmetry.

Emotions

Research on the impact of specific emotions on memory has also been guided by the assumption that emotions should activate emotion-congruent material (Bower, 1981). Hence, emotion congruent material should be easier to recall, more readily perceived, and more likely to interfere with competing material when one experiences the respective emotion. However, the available data, mostly pertaining to anxiety, do not provide strong support for the operation of some general form of emotion congruency (see Mathews & MacLeod, 1994, for an extensive review). Instead, emotions seem to elicit a focus on material that is content relevant rather than on material that is simply feeling consistent. For example, Mogg, Mathews, and Eysenck (1992) observed in an attentional paradigm, that anxious participants were only faster in responding to threatening words when the word pertained to their specific domain of worry. Similarly, Mathews and Klug (1993) crossed the valence of a set of words with whether the content was or was not related to the concerns of anxious patients. Content related words interfered more than did content unrelated words -- and did so regardless of their valence. Mathews and MacLeod (1994, p. 37) therefore concluded, "It is the match with current domain of concern, rather than emotional valence or congruence in a general sense, that determines the information that is given

processing priority." This conclusion is compatible with the assumption that feelings inform us about the current situation, directing our attention to features that are likely to make us anxious.

From Memory to Judgment

Social psychologists' interest in affective influences on memory is mostly motivated by the assumption that affect-related differences in memory mediate affect-related differences in judgment. To do so, the information that comes to mind must seem to be "about" the target of judgment (e.g., Higgins, 1998). If people are aware that it may only come to mind due to their current mood, for example, accessible thought content may be likely to be discounted, as discussed above. Surprisingly, this conjecture has not received direct testing.

WHAT HOLDS WHEN?

Consistent with goals of this handbook, our review of the interplay of feeling and thinking focused on basic principles that apply to more than one type of feeling. Each of the reviewed mechanisms can account for some, but not all, of the available data. Moreover, many of the process assumptions are not mutually exclusive and each one may hold under some conditions. In a commendable integrative effort, Forgas (1995, 2001) proposed a multi-process "affect infusion model" (AIM) that focuses on mood effects and does not address other feelings. The AIM incorporates the theoretical approaches discussed above and can accommodate any mood effect predicted by its component theories. The model's original contribution is an attempt to specify the conditions under which previously identified processes are likely to hold. While we agree with many AIM predictions, a selective discussion of some of its ambiguities suggests that an integrative conceptualization remains a challenging task.

The AIM distinguishes four different processing strategies. If the target is familiar and a previously formed judgment is accessible in memory, people are assumed to rely on a *direct access* strategy, provided that the judgment is not personally relevant. Mood is not assumed to play a role in this case. The prototypical example given (Forgas, 2001, Figure 5.1) is stereotyping, which is assumed to reflect the recall of a previously formed impression of a group. But as reviewed above, people are more likely to rely on stereotypes when they are in a good rather than bad mood (e.g., Bodenhausen et al., 1994). Moreover, they are more likely to draw on a previously formed judgment when in a good mood, following a direct access strategy, but form a new judgment based on currently accessible details when in a bad mood (Bless, Mackie, &

Schwarz, 1992). Hence, moods influence the use of a direct access strategy in the first place.

As a second possibility, the AIM introduces a *motivated processing* strategy, which people may employ when they want to reach a certain conclusion, potentially in the interest of mood management goals. To arrive at the desired conclusion, they may engage in selective information search, which may override mood effects on judgment. We assume that this strategy is less likely when the situation is perceived as problematic, again introducing affective influences.

A third possibility pertains to a *substantive processing* strategy. It is based on extensive memory search and elaboration, giving rise to the influence of mood congruent recall. People are assumed to use this strategy primarily under conditions of unconstrained processing capacity and high accuracy motivation to form judgments that are demanding (as exemplified by atypical, unusual or complex targets) and of some importance to them. Being in a sad mood is assumed to facilitate the adoption of this strategy via increased accuracy motivation, but may impede its adoption via decreased cognitive capacity. The mood-congruency component of this strategy suggests that mood effects on judgment should follow the pattern of mood effects on recall. Empirically, this does not appear to be the case. The judgment effects attributed to substantive processing show a largely symmetrical impact of happy and sad moods (see Forgas, 1992, for a review), whereas mood congruent recall is mostly limited to happy participants in memory experiments, as reviewed above. The strategy further suggests, for example, that cognitive responses to a persuasive message should reflect mood congruent elaboration. Empirically, this is not the case. Sad recipients generate more negative responses to weak arguments, but more positive responses to strong arguments, than happy recipients (Schwarz et al., 1991), which is consistent with differential accuracy motivation but not with mood-congruent elaboration. More complex judgments, however, have often been observed to show stronger mood effects (e.g., Forgas, 1995b; Schwarz et al., 1987). But in the absence of attributional manipulations we can not tell if participants simplified a complex task by relying on their feelings as information or engaged in mood-congruent substantive processing. In support of substantive processing, Forgas (2001) emphasizes that participants spend more time perusing the information when it is complex, but are subsequently fast in providing a judgment. This pattern is also compatible with the possibility that they ponder a complex task and opt for a heuristic shortcut, once they realize how burdensome it would otherwise be. Similarly, the observation of mood congruent recall *after* the judgment is made does not necessarily imply that it mediated the judgment. Instead, the

previously formed judgment may itself serve as a cue in reconstructive memory (for an example see Bless, 1996). As these conjectures indicate, process identification is riddled by uncertainties and diagnostic evidence is often unavailable.

Finally, the AIM's fourth possibility pertains to a *heuristic processing* strategy, based on one's current feelings as a source of information (e.g., Schwarz & Clore, 1983). People are assumed to use this strategy under conditions of limited processing capacity and low accuracy motivation to form judgments that are simple and/or of limited importance to them. From this perspective, any judgment that is susceptible to misattribution effects pertains, by definition, to simple targets of low importance, which is difficult to reconcile with the available evidence. Being in a good mood is predicted to facilitate the adoption of this processing strategy via decreased accuracy motivation, consistent with mood effects on processing style. Finally, the strategy is assumed to be "ineffective and dysfunctional" because "affect can only serve as a heuristic cue due to mistaken inferences" (Forgas, 2001, p. 104), a conclusion that ignores integral affect and the advantages conveyed by fast and efficient affective reactions to the environment (Frijda, 1988; Zajonc, 1980).

Despite such shortcomings, the AIM predicts the correct outcomes more often than not, which makes it a useful guide for considering the possible influence of moods in many applied contexts. This the case because the AIM can accommodate any of the results predicted by its component theories and because different process assumptions often converge on the same outcome prediction, as the next section illustrates.

FEELINGS AND BEHAVIOR

To appreciate how different mood related processes can result in the same outcome, suppose that Jane encounters an opportunity to help Mary. Jane may consider how much she likes Mary, whether she has the resources to help her, whether that experience would be pleasant, or how much good her help might do. If she applies the "How-do-I-feel-about-it?" heuristic to any of these questions, she will arrive at more positive assessments when in a good rather than bad mood, making helping more likely. If her moods influence what comes to mind, her elaborations will be more positive when in a good rather than bad mood, again making helping more likely. If Mary is an unknown other, good mood may facilitate her inclusion in the ingroup through broader categorization, again making helping more likely. If the helping task is not very

demanding, it may also provide Jane with a good opportunity to maintain her pleasant mood. Hence, the feelings-as-information, mood congruent recall, and mood maintenance approaches make the same prediction for positive moods, unless the helping task is highly demanding, which would render it an unlikely avenue for mood maintenance (Schaller & Cialdini, 1990). Moreover, only the mood maintenance approach differs in the predictions for negative moods, as helping may provide an opportunity to improve a bad mood, provided the benevolent act is not too costly. Not surprisingly, positive moods are, indeed, reliably related to prosocial behavior, whereas “the effect of negative moods on benevolence is less consistent,” as Eisenberg and colleagues (2003, p.797) concluded after a comprehensive review. This overdetermined nature of many mood effects precludes inferences about the underlying processes in the absence of additional process information.

Consistent with social psychologists’ preferred theorizing, all influences of moods on prosocial behavior were mediated by cognition or motivation in the above example. In contrast, many emotion theorists (e.g., Frijda, 1986; Leventhal, 1982) believe that emotions affect behavior in more direct ways. For example, fear is assumed to involve behavioral tendencies to escape, anger to involve activation of aggressive responses, and so on. In our reading, the direct effects of emotions are more likely to be motivational, changing the accessibility and priority of goals. The likely goals of fearful or angry persons, for example, are much easier to predict than the likely behaviors. Fear clearly involves a desire to avoid harm or loss, but from knowing only that they are afraid, we cannot predict whether people will sell their stocks, listen to the weather report, or start running. The immediate effects of emotion, therefore, are more mental than behavioral, emphasizing the importance of the processes that were the focus of this chapter.

CONCLUDING REMARKS

The proliferation of research into the interplay of feeling and thinking has resulted in a multitude of findings. Most of them can be framed in terms of two global approaches: An experiential approach that focuses on the informational value of subjective experiences, which include moods, emotions, bodily sensations, and cognitive experiences; and a cognitive approach that focuses on the impact of moods and emotions on the content of the thoughts that come to mind rather than the experience of having the thoughts. Each of these approaches is supported by a number of unique findings, whereas many other findings are compatible with both. For the

latter, diagnostic process evidence that would convince advocates of the respective other approach is often missing (as a comparison of this chapter and Forgas, 2003, will aptly illustrate). While researchers working within each approach are able to produce many of the core effects with considerable reliability, the interplay of the underlying processes is awaiting an encompassing conceptualization. We hope that our accentuation of the principles underlying each approach will help in tackling this formidable task.

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