Feelings-as-Information Theory

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Abstract. *Feelings-as-information theory conceptualizes the role of subjective experiences – including moods, emotions, metacognitive experiences, and bodily sensations – in judgment. It assumes that people attend to their feelings as a source of information, with different feelings providing different types of information. Whereas feelings elicited by the target of judgment provide valid information, feelings that are due to an unrelated influence can lead us astray. The use of feelings as a source of information follows the same principles as the use of any other information. Most important, people do not rely on their feelings when they (correctly or incorrectly) attribute them to another source, thus undermining their informational value for the task at hand. What people conclude from a given feeling depends on the epistemic question on which they bring it to bear; hence, inferences from feelings are context sensitive and malleable. In addition to serving as a basis of judgment, feelings inform us about the nature of our current situation and our thought processes are tuned to meet situational requirements. The chapter reviews the development of the theory, its core propositions and representative findings.*

INTRODUCTION

Human thinking is accompanied by a variety of subjective experiences, including moods and emotions, metacognitive feelings (like ease of recall or fluency of perception), and bodily sensations. Feelings-as-information theory provides a general framework for conceptualizing the role of these experiences in human judgment. It was initially developed to account for the influence of happy and sad moods on evaluative judgment. However, the theoretical principles of the initial mood-as-information work (Schwarz & Clore, 1983) could be fruitfully applied to other types of feelings and developed into a more comprehensive conceptualization of the interplay of feeling and thinking. This chapter summarizes what has been learned.

The first section provides a short personal account of the theory's development and places its assumptions in their historical context (for more detailed discussions of other theoretical approaches see Clore, Schwarz, & Conway, 1994; Schwarz & Clore, 2007). The second section presents the theory's postulates and the third section reviews representative findings.

A LOOK BACK:
THE DEVELOPMENT OF FEELINGS-AS-INFORMATION THEORY

As many readers know from personal experience, our lives look better on some days than on others, even though nothing of any obvious importance has changed. In my case, the upbeat or gloomy mood induced by a sunny or rainy day is sufficient to do the trick. Trying to understand this experience as a graduate student at the University of Mannheim, Germany, in the late 1970's, I turned to what social and cognitive psychologists had learned from the experimental mood research available at the time. One account, advanced by Isen, Shalker, Clark, and Karp (1978) and Bower (1981), held that moods increase the accessibility of mood-congruent information in memory. From this perspective, positive (negative) aspects of life are more likely to come to mind when we are in a happy (sad) mood, resulting in mood-congruent judgments. This approach was consistent with social psychology's new adoption of the information processing paradigm and its emphasis on storage and retrieval processes. However, it didn't seem "quite right" introspectively: on good days, things just "felt" better and this did not seem to involve selective recall of past events of mood-congruent valence. Phenomenological analyses in the introspective tradition of German "armchair psychology" (e.g., Bollnow, 1956), which treated moods as an integrative reflection of one's current situation, seemed closer to the mark – alas, such introspections are to be taken with a grain of salt (Nisbett & Wilson, 1977). A competing perspective, Zajonc's (1980) "affective primacy" hypothesis, had the advantage of avoiding reliance on mood-congruent retrieval processes but lacked a process model specific enough to meet the developing criteria of social cognition research.

A conversation with Bob Wyer offered a different approach. Wyer and Carlston (1979) proposed that affect can serve informational functions, "for example, one's liking for a person may be based partly on the feelings of pleasantness when the person is around" (p. 192). In addition, they conjectured that affective states may direct our attention to information that is suitable to explain one's feelings. While their conjectures were compatible with phenomenological approaches, their conceptualization emphasized the role of cognitive representations of experience at the expense of actual current experience itself, consistent with the information processing paradigm. Research into the influence of arousal (from Schachter and Singer's, 1962, emotion research to Zillman's, 1978, arousal-transfer model and Zanna and Cooper's, 1976, dissonance studies) suggested, however, that the online experience itself may

play a crucial role. More important, this literature also suggested that misattribution manipulations would be suitable experimental tools to address the role of current experience in human judgment.

A post-doctoral year with Wyer and Clore at the University of Illinois provided the opportunity to pursue these issues. Clore and Byrne (1974) had proposed a reinforcement-affect model to account for affective influences on interpersonal attraction. Going beyond the learning theories of the time, their model assumed that rewards exert their influence through the positive affect they elicit. Supporting this notion, laboratory and field experiments showed that associating others with positive feelings is sufficient to increase interpersonal attraction, even when the feelings are incidental and due to an unrelated source (e.g., Griffitt &Veitch, 1971). By the late 1970's Clore began to wonder why we "don't all end up falling in love with the paymaster," as he put it, if the mere co-occurrence of people with reward is sufficient to induce attraction. Does incidental affect only influence our judgments when we are not aware of its source, as Zillman's (1978) arousal studies suggested?

Initial Evidence

These converging interests resulted in a conceptually straightforward study (Schwarz & Clore, 1983, Experiment 1). We asked participants to vividly recall and describe a happy or sad event to induce a corresponding mood and crossed these mood inductions with a misattribution manipulation that took advantage of an somewhat bizarre little room, previously used for auditory research with monkeys (for the inside story see Schwarz & Clore, 2003). This allowed us to suggest to some participants that the room may induce elated feelings and to others that it may induce depressed feelings. Judgments of life-satisfaction served as the dependent variable. Our procedure deliberately stacked the deck in favor of content-driven models: By inducing moods through the recall of a happy or sad event, mood-congruent recall would be facilitated both by the content of the recall task and the induced mood. The predictions were straightforward. If mood effects on judgment were a function of mood-congruent recall (Bower, 1981), participants should report higher life-satisfaction when in a happy rather than sad mood, independent of what we told them about the room. If the experience itself served informative functions, on the other hand, its impact should depend on the feeling's perceived diagnosticity. That is, mood effects on reported life-satisfaction should be attenuated when the mood is attributed to the influence of the room and hence considered uninformative for evaluating one's

life in general (a discounting effect in Kelley's, 1972, terms); however, it should be enhanced when one experiences the mood despite an allegedly opposing influence of the room (an augmentation effect).

The results, shown in Table 1, were consistent with these predictions, although only under sad mood conditions. The latter observation was compatible with Wyer and Carlston's (1979) suggestion that sad moods may require more explanation than happy ones, which would render them more susceptible to attributional manipulations. More important, the obtained augmentation and discounting effects made it unlikely that the influence of moods was driven by mood-congruent recall. After all, we had induced moods by having participants recall happy or sad events, thus adding semantic priming to the assumed affective activation of valenced material (Bower, 1981). Nevertheless, the accessible semantic content had little impact when participants discounted the accompanying negative feelings, assigning a crucial role to the subjective experience itself. Finally, the obtained attributional effects highlighted that the path from feelings to judgment was inferential, in contrast to Zajonc's (1980) assertion that "preferences need no inferences."

A subsequent, more naturalistic study took advantage of sunny and rainy weather as a mood manipulation (Schwarz & Clore, 1983, Experiment 2). As daily experience suggests, participants reported higher life-satisfaction (and a more positive mood) when they were called on sunny than on rainy days. However, the negative influence of bad weather was eliminated when the interviewer, who pretended to call from out of town, first inquired about the weather at respondents' place of residence. This discounting effect was not obtained under sunny weather conditions, again suggesting that sad moods are more likely to be explained than happy moods. In combination, these studies provided first evidence for several assumptions that became core themes in the development of feelings-as-information theory.

Core Themes

First, our findings showed that people attend to their momentary feelings as a source of information in forming judgments, essentially asking themselves, "How do I feel about this?" Later research extended this "informative function" (Wyer & Carlston, 1979) of affective states to other feelings, including non-affective feelings, like the metacognitive experience of ease of recall (Schwarz et al., 1991), and bodily sensations (Stepper & Strack, 1993).

Second, the observed discounting and augmentation effects highlighted that people use

their feelings like any other source of information. They do not rely on them when they become aware that their feelings may be due to an unrelated source, thus undermining their informational value for the judgment at hand. Conversely, they consider their feelings particularly informative when they experience them despite opposing forces. Later research, much of it conducted by Michel Pham and his colleagues, identified additional variables that influence how much weight we give to our feelings (see Pham, 2004).

Third, our initial studies documented more positive judgments under happy than sad moods. While this is true for the bulk of mood research (Schwarz & Clore, 2007), Leonard Martin and colleagues (e.g., Martin, Abend, Sedikides, & Green, 1997) demonstrated that positive feelings can result in negative evaluations. For example, when we feel happy while reading a sad story, we may conclude that it is not a "good sad story" after all, or else it would make us feel sad. Such findings illustrate that the influence of feelings depends on the specific question on which the feeling is brought to bear. This theme proved particularly important in later research on metacognitive experiences (Schwarz, 2004).

Finally, the observation that misattribution effects only emerged under sad moods (Table 1) proved more puzzling. Because most people feel mildly positive most of the time (Matlin & Stang, 1979), we initially suggested that sad moods are deviations from one's usual state and hence more likely to require explanation. This, in turn, would direct attention to possible sources of one's mood (Wyer and Carlston's, 1979), rendering sad moods more susceptible to (mis)attribution manipulations. If so, being in an unexplained sad mood should interfere with other cognitive tasks, due to the competing demands of explaining one's mood. Testing this prediction, Bless, Bohner, Schwarz, and Strack (1990) exposed participants in happy or sad moods to strong or weak persuasive arguments and assumed that sad moods would reduce systematic message elaboration. To our surprise, we found the opposite: sad participants engaged in message elaboration, whereas happy participants did not, by now a familiar and frequently replicated finding (for a review see Schwarz, Bless, & Bohner, 1991). Similarly, Sinclair (1988) reported strong evidence that being in a sad mood reduced halo effects in impression formation. Clearly, sad moods did not pose an explanation problem that interfered with other processing demands; to the contrary, sad moods increased, and happy moods decreased, systematic processing in these studies.

To account for these findings, we (Schwarz, 1990; Schwarz & Bless, 1991) suggested that the informative function of moods is more general than assumed in the initial theorizing, which had

focused on evaluative judgment. In daily life, we usually feel bad when we encounter a threat of negative or a lack of positive outcomes, and feel good when we obtain positive outcomes and are not threatened by negative ones. Hence, our moods reflect the state of our environment (Bollnow, 1956). If so, bad moods may signal a problematic situation, whereas good moods may signal a benign situation. Given the situated nature of human cognition, we may expect that our thought processes are tuned to meet the processing requirements apparently posed by the situation, resulting in systematically different processing strategies under happy and sad moods. Sad moods may foster a systematic processing style that is characterized by bottom-up processing, attention to the details at hand, and limited playfulness and creativity. Happy moods, on the other hand, may foster a top-down processing style that relies more on general knowledge structures and is accompanied by less focused attention and higher playfulness and creativity. By and large these assumptions proved compatible with the accumulating evidence (for reviews see Clore et al., 1994; Schwarz, 2002; Schwarz & Clore, 2007). Moreover, later research showed that any information that signals a benign or problematic situation – from bodily sensations (e.g., Friedman & Förster, 2000) to metacognitive experiences (Song & Schwarz, 2008) or the smiling or frowning face of a communicator (Ottati, Terkildsen, & Hubbard, 1997) – can elicit the corresponding processing style. From this perspective, the misattribution effects observed by Schwarz and Clore (1983) were limited to sad moods because sad moods facilitate the analytic reasoning needed for attributional analyses, whereas happy moods make such reasoning less likely.

In the following sections, I revisit these themes by reviewing the postulates of feelings-as-information theory and illustrative experimental evidence. If social psychologists followed the naming traditions of software engineers, this would arguably be FAIT.3. Its treatment of the use of feelings as a source of information in judgment differs from FAIT.1 (Schwarz & Clore, 1983) by emphasizing that the specific impact of a feeling depends on the epistemic question on which it is brought to bear. Its treatment of the influence of feelings on processing style differs from FAIT.2 (Schwarz, 1990; Schwarz & Bless, 1991) by deemphasizing the role of processing ability (consistent with Bless & Schwarz, 1999) and by extending the range of variables that influence processing style beyond the role of feelings (consistent with Schwarz, 2002). Moreover, the theory's treatment of feelings goes far beyond our initial emphasis on moods and emotions and includes non-affective experiences, consistent with the work conducted in the quarter century since the initial studies.

FEELINGS-AS-INFORMATION THEORY: POSTULATES

The core postulates are summarized in Table 2; they bear on the perceived informational value of feelings, their use as a basis of judgment, and their influence on the spontaneous adoption of different processing styles.

What Feelings Convey

The theory postulates that people attend to their feelings as a source of information, with different types of feelings providing different types of information. This assumption has a long tradition in emotion research. As Frijda (1988, p. 354) put it, "*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." What exactly a given emotion signals can be derived from its underlying appraisal pattern (Ellsworth & Scherer, 2003; Ortony, Clore, & Collins, 1988). Anger, for example, is a response to a loss or lack of reward that is attributed to the causal action of another agent; when no agent attribution is made, a loss gives rise to sadness. Accordingly, anger and sadness both inform us about a loss, but differ in what they tell us about its likely cause, giving rise to differential judgments of responsibility (e.g., Keltner, Ellsworth, & Edwards, 1993). Because emotions arise from ongoing, implicit appraisals of situations with respect to their implications for one's goals, they have an identifiable referent (what the emotion is "about"), a sharp rise time, and limited duration. These characteristics distinguish emotions from *moods,* which lack a clear referent, may come about gradually, may last for an extended time, and are often of low intensity (Bollnow, 1956; Morris, 1989). Hence, moods are more diffuse than emotions and primarily convey generic valence information that lacks a clear referent. These differences are apparent when we say that we are angry "about" something, but "in" a bad mood.

Cognitive feelings like surprise, boredom or feelings of familiarity provide information about the state of one's knowledge (Ortony et al., 1988). Of particular interest to social psychologists is the metacognitive experience of ease or difficulty, which can pertain to recall and thought generation (*accessibility experiences*; Schwarz, 1998) or to the processing of new, external information (*processing fluency*; Winkielman, Schwarz, Fazendeiro, & Reber, 2003). Numerous variables can influence these experiences, from the amount of information a person tries to recall to the presentation format in which new information is presented (e.g., print fonts, figure-ground contrast) and the semantic context in which it is embedded. Because cognitive operations can be easy or difficult for many different reasons, the specific inferences people

draw from these experiences depend on which of many lay theories of mental processes they bring to bear on the task (Schwarz, 2004). In addition, easy processing is experienced as pleasant (as captured by psychophysiological measures, Winkielman & Cacioppo, 2001) and this affective response can itself serve as a basis of judgment (Winkielman et al., 2003).

Finally, *bodily experiences* include feelings like hunger, pain and physiological arousal, which inform us about physical states of the organism. Other bodily experiences provide information that parallels the implications of affective and cognitive feelings. For example, furrowing one's brow (contraction of the zygomaticus) conveys a feeling of effort and affects judgment in ways that parallel the metacognitive experience of difficulty (e.g., Sanna, Schwarz, & Small, 2002; Stepper & Strack, 1993). Similarly, proprioceptive feedback from facial expressions (e.g., Strack, Martin, & Stepper, 1988) and arm flexion and extension (e.g., Friedman & Förster, 2000) influence judgment and processing style in ways that parallel affective influences.

Perceived Informational Value

The theory further postulates that the impact of a given feeling depends on its perceived informational value for the task at hand. When a feeling is elicited by the object of judgment ("integral" in Bodenhausen's, 1993, terminology), it provides valid information about the person's own response to the target. E.g., seeing Susan may elicit positive feelings in Tom and he may be well advised to consider these feelings in (some) judgments of Susan. When the feeling is due to some other source ("incidental"), however, it provides (potentially) misleading information. E.g., Tom's good feelings may be due to the weather rather than Susan. Unfortunately, people are more sensitive to their feelings than to where their feelings come from. They commonly assume that any feelings they have, and any thoughts that come to mind, are "about" whatever is in the focus of their attention (Higgins, 1998) – or why else would they have them now, in this context? Hence, they are likely to perceive incidental feelings as being "about" the target of judgment, unless their attention is drawn to a plausible incidental source.

Whenever people (correctly or incorrectly) attribute their feelings to an incidental source, the perceived informational value of their feelings for the judgment at hand is undermined. Conversely, when they perceive that they have these feelings despite opposing forces, their feelings' perceived informational value is augmented. The sad mood conditions of Table 1 illustrate these discounting and augmentation effects.

When the informational value of their feelings is called into question, people turn to other sources of information to arrive at a judgment. As seen above, participants in the Schwarz and Clore (1983) study who discounted their sad mood arrived at life-satisfaction judgments that did not differ from participants in the control condition, who were not exposed to a mood manipulation. Presumably, both groups could draw on extensive other information about their own lives, resulting in similar judgments. Had such alternative inputs not been available, they might have resorted to an inferential correction strategy akin to, "I feel bad about my life, but this may be due to the room – so I should adjust my judgment upward." Such theory-driven correction strategies usually result in overcorrection, that is, a bias in the opposite direction (Strack & Hannover, 1996; Wilson & Brekke, 1994). Accordingly, discounting one's feelings as a source of information can either eliminate their influence (when alternative sources of information are accessible) or elicit a bias in the opposite direction (due to overcorrection in the absence of alternative inputs).

The theory further assumes that changes in one's feelings are more informative than stable states. This assumption is consistent with numerous studies in sensory perception and the covariation principle of attribution research. However, it has rarely been explicitly tested in feelings-as-information experiments (for exceptions see Hansen, Dechene, & Wänke, 2008; Shen, Jiang, & Adaval, 2010). By relying on the experimental induction of feelings, experiments always involve a change from baseline as part of the methodological routine, which contributes to the feeling's perceived informational value.

Some Misunderstandings

Some common misunderstandings of these assumptions deserve attention. To disentangle the contributions of the perceiver's feelings from other information about the target, experimental tests of the feelings-as-information hypothesis rely on the induction of incidental feelings. This gave rise to the erroneous conclusion that the use of feelings as a source of information is limited to incidental feelings, which led Forgas (2001, p. 104) to assert that "affect can only serve as a heuristic cue due to mistaken inferences," making reliance on one's feelings "an ineffective and dysfunctional strategy." This assertion confuses the operational and theoretical level. While reliance on incidental feelings can indeed be dysfunctional, integral feelings provide valid information and attending to this information is highly adaptive, as a large body of research on emotional intelligence and the role of feelings in decision making indicates

(see Barrett & Salovey, 2002; Damasio, 1994).

Falling prey to the same confusion, Slovic and colleagues (see Slovic, Finucane, Peters, & MacGregor, 2002) proposed an "affect heuristic" to account for the influence of integral feelings, which they considered distinct from the influence of incidental feelings. Unfortunately, integral feelings are inherently confounded with the positive or negative target attributes that elicit them, making it impossible to determine if observed differences are driven by experiential information in the form of integral feelings (as Slovic and colleagues assume) or by declarative information in the form of different target attributes. From the perspective of feelings-as-information theory, the use of integral and incidental feelings as a source of information reflects the same basic mechanism – and any influence of target attributes that is not mediated by the feelings they elicit is better described in terms of declarative rather than "affective" information.

Finally, some observers (e.g., Forgas, 2001) suggested that feelings-as-information effects require a conscious attribution of the feeling to the target. This is not the case. Whereas discounting and augmentation effects require some level of conscious attribution, the mere use of one's feelings as a source of information does not. As noted, people usually consider their thoughts and feelings to be "about" whatever is in the focus of their attention, rendering reliance on them the automatic default option. Accordingly, the impact of feelings increases when contextual influences, like time pressure (Siemer & Reisenzein, 1998), limit the opportunity to engage in attributional analyses, in contrast to what a conscious attribution requirement would predict.

From Feelings to Judgments

The theory further postulates that whenever feelings are used as a source of information, their use follows the same rules as the use of any other information. First, feelings are only used as a source of information when their informational value is not called into question (e.g., Schwarz & Clore, 1983). Second, the impact of feelings increases with their perceived relevance to the judgment at hand. For example, moods exert a stronger influence when people make decisions for themselves rather than others, whose affective response may differ from their own (Raghunathan & Pham, 1999) or when they evaluate the hedonic pleasure that can be derived from an activity rather than the activity's instrumental value for academic achievement (Pham, 1998). Third, the impact of feelings decreases the more other relevant inputs are accessible. For example, people are less likely to rely on their feelings when they have high expertise in the

domain of judgment (e.g., Ottati & Isbell, 1996; Sedikides, 1995), which presumably facilitates the assessment of the relevance of one's feelings and renders other information easily accessible. Fourth, as is the case for any other highly accessible piece of information, the impact of feelings is more pronounced under conditions of low processing capacity (e.g., Greifeneder & Bless, 2007; Siemer & Reisenzein, 1998) or motivation (e.g., Rothman & Schwarz, 1998). These conditions limit assessments of the diagnosticity and relevance of one's feelings and the search for possible alternative inputs. As these examples illustrate, the variables that govern the use and impact of experiential information as a basis of judgment parallel the variables that govern the use and impact of declarative information, consistent with the basic feelings-as-information logic.

Finally, feelings share with other information that their specific implications depend on the question asked. The observation that Bob has published a highly acclaimed book every year since his Ph.D. can be brought to bear on many judgments of Bob, from his intelligence and ambitiousness to his professional standing and his commitment to spending time with his kids. The same holds for feelings. What people conclude from a given feeling depends on the epistemic question on which they bring it to bear. For example, Martin, Ward, Achée, and Wyer (1993) asked happy and sad participants to list birds. When asked whether they are satisfied with what they accomplished, happy participants inferred that they are satisfied and terminated the task, whereas sad participants inferred that they are not yet satisfied and continued. This pattern reversed when participants were asked whether they enjoy what they are doing. In this case, happy participants inferred enjoyment and continued with the task, whereas sad participants inferred a lack of enjoyment and terminated the task. In both cases, their judgments were consistent with the valence information provided by their mood, yet this valence information had diverging behavioral implications, depending on the specific question on which it was brought to bear.

Importantly, some feelings require more interpretation, and allow for a wider range of inferences, than others. As already noted, moods provide broadly applicable valence information, whereas specific emotions inform us that a specific appraisal pattern has been met, which constrains the range of plausible inferences. At the other extreme, metacognitive experiences primarily inform us that our cognitive operations are easy or difficult – and they may be so for many reasons. For example, we may find it difficult to recall information because the event happened a long time ago; because we never found it important and hence didn't pay attention;

because we lack expertise in the domain, and so on. Which inferences we draw from difficulty of recall will therefore depend on which of these naïve theories of mental processes we bring to bear. Applicable theories are usually brought to mind by the judgment task (Schwarz, 2004) and the same metacognitive experience can result in differential judgments of expertise, importance or temporal distance, depending on the specific question asked.

Cognitive Tuning: Feelings and Processing Style

In addition to providing information that can serve as a basis of judgment, feelings influence *how* people process information, that is, their processing style. A number of different explanations have been offered for this observation, usually highlighting the role of one specific type of feeling (for reviews see Schwarz & Clore, 2007, and the contributions in Martin & Clore, 2001). Feelings-as-information theory provides a unified conceptualization of these influences in the context of a situated cognition framework (Smith & Semin, 2004). It assumes that human cognition stands in the service of action (James, 1890) and that our cognitive processes are responsive to the environment in which we pursue our goals. This responsiveness ranges from the higher accessibility of knowledge relevant to the current situation (e.g., Yeh & Barsalou, 2006) to the choice of processing strategies that meet situational requirements (e.g., Wegner & Vallacher, 1986). When things go smoothly and we face no hurdles in the pursuit of our goals, we are likely to rely on our pre-existing knowledge structures and routines, which served us well in the past. Moreover, we may be willing to take some risk in exploring novel solutions. Once things go wrong, we abandon reliance on our usual routines and focus on the specifics at hand to determine what went wrong and what can be done about it.

Feelings play a crucial role in this tuning process by providing a fast and parsimonious indicator of whether our current situation is “benign” or “problematic”. The influence of feelings on processing style is eliminated when the informational value of the feeling called into question (e.g., Sinclair, Mark, & Clore, 1994) and can be overridden by the individual's goals or explicit task demands (e.g., Bless et al., 1990).

REPRESENTATIVE FINDINGS

Next, I review representative findings pertaining to the influence of moods, emotions, and metacognitive experiences on judgment and processing style and highlight some real-world implications (for more extensive reviews of findings see Clore et al., 1994; Schwarz & Clore, 2007).

Feelings as a Basis of Judgment

Moods

As discussed, moods convey valence information that usually results in more positive judgments when people are in a happy rather than sad mood, with neutral moods falling in between. This influence is not observed when the informational value of the mood is called into question through (mis)attribution manipulations (Schwarz & Clore, 1983; for conceptual replications see Gorn, Goldberg, & Basu, 1993; Savitsky et al., 1998; Siemer & Reisenzein, 1998, among others). Even when one's mood is considered informative, its impact depends on its perceived relevance to the judgment at hand (e.g., Pham, 1998) and the accessibility of competing inputs (e.g., Sedikides, 1995), as discussed above. Importantly, mood effects are not limited to inconsequential judgments. Instead, moods have been found to influence highlyg consequential decisions, from medical school admissions (Redlmeier & Baxter, 2009) to stock market investments. For example, Hirshleifer and Shumway (2003) observed a reliable influence of the weather on stock market returns in 26 countries: the market is more likely to go up when the sun shines in the city that hosts the country's major stock exchange. Presumably, the upbeat mood associated with sunny weather makes investors more optimistic about the future of the economy, paralleling observations in experiments.

Whereas the bulk of the research shows more positive (negative) judgments under happy (sad) mood, moods can also result in mood-incongruent judgments under specific conditions. First, mood incongruent judgments can result from the logic of discounting effects themselves (e.g., Ottati & Isbell, 1996). Suppose, for example, that you are evaluating a job candidate and are aware that you are in a miserable mood due to an earlier event. To which extent are your bad feelings an integral part of your reaction to the candidate and to which extent are they due to the earlier event? If you fully discount your bad feelings, you may arrive at an unduly positive evaluation of the candidate. Second, 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) conducted an experiment in a very pleasant or unpleasant room. Replicating earlier findings, their student participants reported higher life-satisfaction when the pleasant room induced a positive mood than when the unpleasant room induced a negative mood. When asked about 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. Finally, the target of judgment can carry affective expectations to which one's current feelings are compared. E.g., Martin and colleagues (1997) observed that happy participants rated a sad story less favorably than sad participants. Presumably, their happy feelings implied that the sad story failed to achieve its goal of making them feel sad, leading them to conclude that it was a poor sad story.

Emotions

As observed for moods, the impact of specific emotions is eliminated when they are attributed to an incidental source. For example, Schwarz, Servay, and Kumpf (1985) found that a fear arousing communication did not affect participants' attitudes when they attributed their feelings to allegedly arousing side-effects of a pill; conversely, expecting the pill to have tranquilizing effects enhanced the impact of the fear arousing message. However, the informational value of specific emotions differs from the informational value of global moods in ways that can be traced to the role of appraisals.

Recall that emotions reflect the person's appraisal of a specific event (Ellsworth & Scherer, 2003; Ortony et al., 1988), which is in the focus of the person's attention. This makes emotions less likely to be misread as bearing on unrelated targets than is the case for diffuse moods. Indeed, merely labeling one's current feelings with specific emotion terms is sufficient to elicit an event attribution and has been found to be as efficient in eliminating effects on unrelated judgments as a standard misattribution manipulation (Keltner, Locke, & Audrain, 1993). Note that this observation has important methodological implications: using detailed emotion terms as manipulation checks invites causal attributions to determine the specific emotion, which can eliminate the expected effect.

Moreover, experiencing an 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. Accordingly, the influence of emotions can be predicted on the basis of the underlying appraisals (e.g., Lerner & Keltner, 2000). For example, Lerner and colleagues (2003) 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.

Metacognitive Experiences

Compared to the appraisal information conveyed by emotions, the information conveyed by metacognitive experiences of ease or difficulty is relatively diffuse. All the experience, by itself, conveys is that "this" is easy or difficult – and most cognitive operations can be so for many different reasons. Hence, the same experience can give rise to different inferences, depending on which of many lay theories of mental processes comes to mind (Schwarz, 2004). As observed for moods and emotions, the influence of metacognitive experiences is eliminated when they are attributed to an incidental source (e.g., Schwarz et al., 1991).

Accessibility experiences. As an example, consider the ease or difficulty with which information can be brought to mind. According to most models of judgment, an object should be evaluated more favorably when we recall many rather than few positive attributes; similarly, an event should seem more likely when we generate many rather than few reasons for its occurrence. Empirically, the opposite is often the case. For example, people consider themselves less assertive after recalling many rather than few examples of their own assertive behavior (Schwarz et al., 1991); hold an attitude with less confidence after listing many rather than few supporting arguments (Haddock et al., 1999); and consider an event less likely after listing many rather than few reasons for its occurrence (Sanna & Schwarz, 2004). Throughout, their inferences are consistent with the implications of accessible thought content when thought generation is easy (few), but opposite to these implications when thought generation is difficult (many). This pattern reflects a lay theory of mental processes that is at the heart of Tversky and Kahneman's (1973) availability heuristic: "The more exemplars exist, the easier it is to bring some to mind." Hence, the difficulty of generating many reasons or examples suggests that there aren't many, giving rise to the above conclusions. When participants attribute the experienced difficulty to an incidental influence, like music played in the background, its informational value is undermined and they turn to accessible thought content as an alternative input. In this case, the otherwise observed pattern reverses and they infer, for example, that they are more assertive the more examples of assertive behaviors they recall (Schwarz et al., 1991). Similarly, yoked participants, who merely read the thoughts generated by someone else 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 (Wänke, Bless, & Biller, 1996). These observations highlight that the thought content by itself is compelling once it is not qualified by a

subjective difficulty experience.

Other lay theories hold, for example, 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 or many other theories comes to mind depends on the question posed. Schwarz and Xu (2009) 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 they found the event at the time, they inferred higher importance after recalling two rather than ten details. Thus, the same accessibility experience informed judgments of temporal distance or of importance, depending on the question posed. More important, application of a given theory entails an attribution of the experience to a specific cause (here, recency or importance), which changes the implications of the experience for other judgments (Schwarz, 2004). Accordingly, participants who initially attributed the difficulty of recalling many details to the event's temporal distance subsequently reported that the event was very important to them – after all, they could still recall details even though the event had apparently happened long ago, so it must have been quite important. Conversely, participants who initially attributed difficulty of recall to low personal importance subsequently dated the event as closer in time – after all, they could still recall details despite the event's low personal importance, so it must have been quite recent. Such findings (for a review see Schwarz, 2010) show that inferences from metacognitive experiences are highly malleable, presumably because people are aware that cognitive operations can be easy or difficult for many different reasons, each of which provides a different inference rule.

Paralleling the findings for other feelings, 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. The latter conditions include high personal relevance (e.g., Rothman & Schwarz, 1998), high need for cognition (e.g., Greifeneder & Bless, 2009), and being in a sad rather than happy mood (e.g., Ruder & Bless, 2003).

Processing fluency. Just like information can be easy or difficult to bring to mind, new information that we encounter can be easy or difficult to process. Numerous variables can influence ease of processing, ranging from presentation characteristics (like figure-ground contrast, print font, or rhyming vs. non-rhyming form) to the semantic relatedness of the material

and the frequency and recency of previous exposure. Because these variables result in similar phenomenological experiences, 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 (Schwarz, 2004, 2010).

One naïve theory that is of particular importance to social psychological phenomena is the (usually correct) assumption that familiar material is easier to process than unfamiliar material. Hence, fluently processed material seems more familiar than disfluently processed material, even when the fluency experience is solely due to incidental variables, like the print font or color contrast in which the material is presented. As observed for other feelings, drawing people's attention to these incidental sources of fluency undermines the informational value of the experience and eliminates the otherwise observed effects (e.g., Novemsky et al., 2007). In the absence of such attribution manipulations, however, the fluency-familiarity association affects numerous judgments of everyday importance, including judgments of social consensus, truth, and risk.

As Festinger (1954) noted, we often rely on social consensus information to determine whether an assertion is true or false – if many people believe it, there's probably something to it. One heuristic to estimate social consensus is to assess whether the assertion seems familiar. Accordingly, fluency of processing gives rise to increased estimates of social consensus (Weaver, Garcia, Schwarz, & Miller, 2007) and facilitates the acceptance of a statement as true (for a review see Schwarz, Sanna, Skurnik, & Yoon, 2007). For example, statements like "Osorno is a city in Chile" are more likely to be judged "true" when they are presented in colors that make them easy rather than difficult to read against the background (Reber & Schwarz, 1999).

Familiarity also figures prominently in intuitive assessments of risk – if a stimulus is familiar and elicits no negative memories, it presumably hasn't hurt us in the past. Accordingly, incidental variables that affect processing fluency also influence peoples' risk assessments. For example, ostensible food additives are perceived as more hazardous when their names are difficult (e.g., Fluthractnip) rather than easy (e.g., Magnalroxate) to pronounce (Song & Schwarz, 2009) and stocks with easy to pronounce ticker symbols attract more investors at their initial public offering (Alter & Oppenheimer, 2006). In addition to the mediating role of perceived familiarity observed by Song and Schwarz (2009), intuitive assessments of risk may be further affected by perceivers' positive affective response to fluently processed stimuli (addressed

below), consistent with the observation of mood effects on judgment of risk (Johnson & Tversky, 1983) and the beneficial influence of sunny weather on the stock market (Hirshleifer & Schumway, 2003).

Fluency and affect. As known since Zajonc's (1968) pioneering mere exposure studies, repeated exposure to an initially neutral stimulus, without any reinforcement, leads to gradual increases in liking. However, repeated exposure is just one of many variables that can increase processing fluency and any other variable that facilitates fluent processing has the same effect. 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 can be traced to increased processing fluency (Reber, Schwarz, & Winkielman, 2004).

This fluency-liking link reflects that fluent processing itself is experienced as pleasant and elicits a positive affective response that can be captured with psychophysiological measures (Winkielman & Cacioppo, 2001). If this affective response mediates the influence of fluency on liking, it should be eliminated when the positive affect is attributed to an incidental source. Empirically, this is the case as Winkielman and Fazendeiro (reported in Winkielman et al., 2003) demonstrated with misattribution procedures.

Summary

As this review of representative findings illustrates, people attend to a wide range of feelings as a source of information. However, they are more sensitive to their feelings than to where these feelings come from and routinely consider incidental feelings relevant to the task at hand. What exactly they conclude from a given feeling depends on the epistemic task they face. Different epistemic tasks bring different lay theories to mind, which link the feeling to the task at hand and serve as inference rules. When feelings are used as a source of information, their use follows the same rules as the use of any other information; hence, the impact of feelings increases with their perceived relevance and applicability and decreases with the consideration of alternative inputs. Whenever people become aware that their feelings may be due to an incidental source, the informational value of the feeling is discredited and people turn to alternative inputs to arrive at a judgment. These regularities hold for moods, emotions, and

metacognitive experiences as well as for bodily sensations (reviewed in Schwarz & Clore, 2007).

Feelings and Processing Style

The theory further predicts that feelings or environmental cues that signal a "problematic" situation foster an analytic, bottom-up processing style with considerable attention to details, whereas feelings or environmental cues that signal a "benign" situation allow for a less effortful, top-down processing style and the exploration of novel (and potentially risky) solutions (Schwarz, 1990, 2002). This does not imply that people in a happy mood, for example, are unable or unwilling to engage in analytic processing (in contrast to what an earlier version of the theory suggested; Schwarz & Bless, 1991). Instead, it merely implies that happy feelings (and other "benign" signals) do not convey a need to do so; when task demands or current goals require bottom-up processing, happy individuals are able and willing to engage in it. A study that addressed the influence of moods on people's reliance on scripts (Schank & Abelson, 1977) illustrates this point.

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 also worked on a concentration test that required detail-oriented processing; in contrast, the restaurant story could be understood by engaging either in script-driven top-down processing or in data-driven bottom-up processing. Happy participants relied on the script, as indicated by the classic pattern of schema guided memory: they were likely to recognize previously heard script-inconsistent information, but also showed high rates of intrusion errors in form of erroneous recognition of script-consistent information. Neither of these effects was obtained for sad participants, indicating that they were less likely to draw on the script to begin with. Given that top-down processing is less taxing than bottom-up processing, we may further expect that happy participants' reliance on the script allows them to 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 (like a 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.

Numerous findings pertaining to a broad range of feelings (from moods and emotions to bodily experiences and processing fluency) and cognitive tasks (from creative and analytic problem solving to persuasion and stereotyping) are consistent with the predictions of feelings-as-information theory (for reviews see Schwarz, 2002; Schwarz & Clore, 2007). Here I focus on two domains of particular interest to social psychologists, namely persuasion and stereotyping.

Persuasion

In general, strong arguments are more persuasive than weak arguments when recipients engage in systematic message elaboration, whereas argument strength exerts little influence when they do not (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 (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. 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). Moreover, the spontaneously adopted processing strategy can be overridden by other variables, such as 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).

Paralleling the influence of moods, the experience of low processing fluency (which is associated with negative affect and a sense that the processed material is unfamiliar) also fosters the adoption of detail-oriented bottom-up processing, whereas high processing fluency fosters top-down processing (e.g., Schwarz & Song, 2008). Not surprisingly, numerous environmental cues can serve the same informational functions. For example, 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 (Ottati et al., 1997). Further illustrating the power of contextual cues, Soldat and Sinclair (2001) printed persuasive messages on colored paper. Their recipients were persuaded by strong arguments, but not by weak arguments, when the paper had a

depressing blue hue, whereas both types of arguments were similarly persuasive when the paper had an upbeat red hue.

Stereotyping and Impression Formation

We can form impressions of others by attending to their specific behaviors (bottom-up processing) or by drawing on stereotypic knowledge about social categories (top-down processing). Reiterating the observations from persuasion research, 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. This results in more stereotypical judgments under happy than under sad moods (e.g., Bodenhausen, et al., 1994; for a review see Bless, et al., 1996). Related research into the influence of brands on product evaluation similarly shows higher reliance on brand information under happy than sad moods (e.g., Adaval, 2001). Paralleling the persuasion findings, happy individuals' reliance on category membership information can be overridden by manipulations that increase their processing motivation, such as personal accountability for one's judgment (Bodenhausen, et al., 1994).

Summary

In sum, internal and external cues that signal a benign or problematic situation have cognitive and motivational consequences (Schwarz, 2002). 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 & Clore, 2007), which offers a unified conceptualization of the operation of internal and external signals in the context of situated cognition.

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Table 1. Life-satisfaction as a function of mood and attribution

	Expectation about room		
	Tense	None	Elated
Induced mood			
Positive	9.6a	8.6a	9.7a
Negative	8.6a	5.7b	4.4b
Control	--	8.9a	--

Note. Shown are mean reports of life-satisfaction (11=very satisfied). Means not sharing a common subscript differ at $p < .05$. Adopted from Schwarz & Clore (1983).

Table 2. Postulates

1. People attend to their feelings as a source of information.
    a. Different types of feelings provide different types of information.

2. The impact of a given feeling depends on its perceived informational value for the task at hand.
    a. People usually experience their feelings as being "about" whatever is in the focus of attention; this fosters the perception that incidental feelings are relevant.
    b. When a feeling is attributed to an incidental source, its informational value is discounted; conversely, when it is experienced despite perceived opposing forces, its informational value is augmented.
    c. Changes in one's feelings are more informative than stable states.

3. When feelings are used as information, their use follows the same principles as the use of any other type of information.
    a. The impact of feelings increases with their perceived relevance to the task at hand and decreases with the accessibility and consideration of alternative diagnostic inputs, which is a function of processing motivation and capacity.
    b. What people conclude from a given feeling depends on (i) the epistemic question on which they bring it to bear and (ii) the lay theory of experience applied.

4. Like other information, feelings can
    a. serve as a basis of judgment
    b. influence the choice of processing strategies; feelings that signal a "problematic" situation foster an analytic, bottom-up processing style, whereas feelings that signal a "benign" situation foster a more global, top-down processing style.