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Address correspondence to: rainer.greifeneder@unibas.ch

When Do People Rely on Affective and Cognitive Feelings in Judgment? A Review

Rainer Greifeneder

University of Mannheim, Germany

Radboud University Nijmegen, The Netherlands

Herbert Bless

University of Mannheim, Germany

Michel Tuan Pham

Columbia University, USA

Abstract

Although people have been shown to rely on feelings to make judgments, the conditions that moderate this reliance have not been systematically reviewed and conceptually integrated. This article addresses this gap by jointly reviewing moderators of the reliance on both subtle affective feelings and cognitive feelings of ease-of-retrieval. The review revealed that moderators of the reliance on affective and cognitive feelings are remarkably similar and can be grouped into five major categories: (1) the salience of the feelings, (2) the representativeness of the feelings for the target, (3) the relevance of the feelings to the judgment, (4) the evaluative malleability of the judgment, and (5) the level of processing intensity. Based on the reviewed evidence, it is concluded that the use of feelings as information is a frequent event and a generally sensible judgmental strategy, rather than a constant source of error. Avenues for future research are discussed.

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Theorizing in the various social sciences has historically assumed that judgments are based solely on content information. As exemplified by the computational person metaphor, individuals were assumed to form judgments by systematically evaluating all available and pertinent content information in an unbiased manner. However, over the last thirty to thirty-five years, a considerable amount of psychological research has challenged this assumption by showing that judgments may be formed not only on the basis of content information, but also on the basis of feelings, such as being in a positive or negative mood, having positive or negative feelings towards a target, or experiencing ease or difficulty when recalling some piece of information from memory. It is by now well accepted that affective and cognitive feelings can exert powerful influences on judgments, and the recent upsurge in scientific as well as public interest in the impact of feelings pays tribute to this seminal scientific advance.

Although numerous studies have demonstrated that feelings may influence judgments (for reviews, see Forgas, 1995a; Loewenstein, Weber, Hsee, & Welch, 2001; Pham, 2008; Schwarz, 1990, 1998, 2004; Schwarz & Clore, 2007), the *conditions* under which these influences take place have not been comprehensively reviewed. This is surprising, considering that much can be learned from such a review. First and foremost, such an analysis clarifies *when* feelings are likely to influence judgments, thereby delineating the prevalence of such effects outside psychological laboratories. This is critical, because knowing that an effect *can* occur does not tell much about its ecological importance, since an effect that can be shown may still be unlikely to occur in general. Hence, after establishing an effect (in so-called “first-generation” research, Zanna & Fazio, 1982), it is important to investigate the *conditions* under which the effect is likely to occur (in second- or third-generation research). To date, a variety of such conditions have been identified both within the realm of affective feelings and within the realm of cognitive feelings. Yet, while some of these findings have been reviewed previously (e.g., Forgas, 1995a; Pham, 2008; Schwarz & Clore, 2007), moderators were not the real focus of these reviews and often examined only

selectively or tangentially. Unlike these previous reviews, this paper puts the spotlight on moderators of the reliance on feelings and offers for the first time a formal overview.

This review is also unique in that it jointly reviews both variables that moderate the influence of affective feelings, and variables that moderate the influence of cognitive feelings in judgment. This joint review is motivated by recent theoretical suggestions that affective and cognitive feelings share many commonalities (e.g., Bless & Forgas, 2000; Clore, 1992; Koriat & Levy-Sadot, 1999; Schwarz & Clore, 1996, 2007; Strack, 1992). Such a joint review allows for a broader picture of the role of feelings in judgment and bridges the often-unconnected literatures on the role of affective and cognitive feelings in the fields of social psychology and consumer psychology.

As with any review, the scope of the present paper is necessarily restricted. First, this review focuses on the interplay between feelings and *judgments*. Although this focus is extended, when appropriate, to related variables such as choices and decisions, other dependent variables such as information search or memory are not considered (for reviews of the effects of feelings on cognitive processes such as attention, encoding, or storage, see Bless, 2001; Forgas, 1995a; Schwarz & Clore, 2007). Also, we do not review findings where the impact of feelings on judgments is mediated by differences in processing, for example, findings indicating that different affective states trigger different degrees of stereotyping (e.g., Bodenhausen, Kramer, & Süsser, 1994; Bodenhausen, Sheppard, & Kramer, 1994).

Second, this review focuses on one type of affective feeling—subtle incidental or integral affective experiences—and one type of cognitive feeling—subtle experiences of ease-of-retrieval. Other types of affective feelings, such as strong emotions, or other types of cognitive feelings, such as feelings of knowing, are not reviewed. We focus on these two particular types of feelings for two related reasons. First, most studies on factors moderating the reliance on feelings have investigated these two types of feelings. Second, whereas there are established methodological paradigms for isolating the reliance on these two types of feelings—Schwarz and Clore's (1983) misattribution paradigm for subtle affective feelings, and Schwarz and colleagues' (1991) ease-of-retrieval paradigm for ease-of-retrieval

feelings—equivalent paradigms are currently not available or are not as easily administered for other types of feelings. As a consequence of this, the proposed conclusions are, strictly speaking, empirically restricted to these two particular examples of affective and cognitive feelings. This important caveat notwithstanding, there is reason to believe that the proposed conclusions can be extended to other affective and cognitive feelings (e.g., Clore, 1992), even though not all moderators may be equally important with all feelings, as discussed in more detail later.

Third, this review focuses on findings in which individuals are found to differ in the *extent* to which they rely on their feelings in forming judgments. Findings in which individuals differ in terms of the *conclusions* that they draw from their feelings (but not in terms of the extent to which they rely on their feelings) are not included. For example, the finding that incidental mood states or feelings of ease-of-retrieval cease to influence judgments when individuals are led to attribute these feelings to a source other than the target (e.g., Schwarz et al., 1991; Schwarz & Clore, 1983) is a typical example of moderation of the reliance on feelings, in that different attributions about the source of the feelings lead to different degrees of reliance on these feelings. In contrast, the finding that a positive mood state increases evaluation of a happy story but decreases evaluation of a sad story (Martin, Abend, Sedikides, & Green, 1997) is not considered to be a case of moderated reliance on feelings, because even though the feelings are interpreted differently depending on the nature of the story, they are presumably relied on to the same extent in both cases.

Finally, this review focuses on findings that highlight the *experiential quality* of feelings, because it is their experiential quality that sets feelings apart from activated content, and contributes to their often unique impact on judgments and decisions (e.g., Bless, 2002; Damasio, 1994; Loewenstein et al., 2001; Slovic, Finucane, Peters, & MacGregor, 2002). This review therefore puts the spotlight on studies in which the impact of feelings on judgments can be conceptualized as direct and *not* mediated by activated content information, as further detailed below.

Based on this set of selection criteria, a comprehensive literature search was performed, which yielded a set of 55 contributions from the domain of affective feelings, and 34 contributions from the domain of cognitive feelings. Before turning to this evidence, however, we first summarize what is meant by “feelings” and how they are thought to influence judgments.

Feelings and judgments

In this section, we first define what is typically meant by “feelings.” After outlining evidence of the influence of feelings on judgment, we then distinguish between two primary theoretical accounts of this influence: the feelings-as-information account, and the priming-account. Focusing on the former account, we then identify some core tenets of this account, from which we derive five general hypotheses about the types of variables that are likely to moderate the reliance on feelings.

Different kinds of feelings

Clore (1992) suggests that feelings can be grouped into three categories: affective, bodily, and cognitive feelings. *Affective* feelings are valenced subjective experiences that may or may not be directly related to an object (e.g., Frijda, 1994; Schwarz & Clore, 1988). They encompass moods, emotions, and other affective experiences. *Bodily* feelings include reflections of physical processes such as hunger or pain, as well as proprioceptive feedback, such as from arm flexion or extension (Cacioppo, Priester, & Berntson, 1993) or from facial expressions (e.g., Strack, Martin, & Stepper, 1988). *Cognitive* feelings include experiential states that reflect activated content information or accompany cognitive processes, such as feelings of familiarity (e.g., Jacoby & Dallas, 1981) or the ease with which information can be retrieved from memory (ease-of-retrieval, e.g., Tversky & Kahneman, 1973). Such experiential states have been called *cognitive* because they are associated with thinking and memory processes. They are considered *feelings* because they are experienced much like affective or bodily feelings are (for an integrative review on fluency experiences, see Alter &

Oppenheimer, 2009; for a recent review on the truth-effect, see Dechêne, Stahl, Hansen, & Wänke, in press). The present review focuses on subtle affective and cognitive feelings.

Affective feelings can be characterized as either incidental or integral to the target (Bodenhausen, 1993). *Incidental* feelings are due to a source other than the judgmental target and are thus, objectively, unconnected to the target, such as the positive mood state we may be in on a sunny day while evaluating a job candidate. However, through misattribution mechanisms discussed later, these feelings may appear related to the target. In contrast, *integral* feelings come from the target itself: they can be defined as those that are “elicited by features of the target object, whether these features are real, perceived, or only imagined” (Cohen, Pham, & Andrade, 2008, p. 308). Examples may be the attraction experienced toward a beautiful stranger, or the anxiety experienced when thinking about an impending public speech. The distinction between incidental and integral affective feelings thus lies in the objective source of feelings. This distinction has recently been extended to the realm of cognitive feelings (Schwarz, 2008). For instance, feelings of ease or difficulty may be incidental if they are due to causes unrelated to the inherent accessibility of the material to be retrieved, such as when contracting the corrugator muscle (forehead) is perceived as a signal of effort (Stepper & Strack, 1993). In contrast, feelings of ease or difficulty are integral if they are due to the accessibility of the material itself (e.g., differential accessibility of extreme vs. less extreme causes of death, Combs & Slovic, 1979). Note that because incidental feelings can be attributed to the target, it may reversely be the case that integral feelings elicited by the target are not perceived as resulting from the target (e.g., Pham, 1998, Exp. 3). Therefore, it is not the objective relationship between the feelings and the target that matters in judgment, but the person’s *subjective* perception of this relationship, a notion known as representativeness (Pham, 1998; Strack, 1992).

How feelings influence judgments

Affective feelings. Affective feelings have been shown to influence a wide variety of judgments, including life satisfaction (e.g., Schwarz & Clore, 1983; Strack, Schwarz, & Gschneidinger, 1985), consumption intention (e.g., Pham, 1998), risk estimates (e.g., Gasper

& Clore, 2000; Johnson & Tversky, 1983), pleasantness of pictures (e.g., Isen & Shalke, 1982), and attitudes toward political issues (e.g., Forgas & Moylan, 1987). In fact, the list of judgments on which affective feelings have been shown to have an impact appears to be endless (for reviews, e.g., Forgas, 1995a; Loewenstein et al., 2001; Pham, 2004, 2008; Schwarz & Clore, 2007), clearly showing that judgments *can* be influenced by affective feelings.

While there is little doubt that affective feelings can influence judgments, the processes by which these influences are thought to take place have been debated. Two major types of accounts of the influence of affective feelings on judgments have been advanced (Clore, 1992; Forgas, 1995a). According to the first type, affective feelings can be conceptualized as *experiential* information that people rely on when forming judgments (e.g., Schwarz & Clore, 1983, 1988; Wyer & Carlston, 1979). Called the affect-as-information hypothesis, this account holds that feelings constitute a source of information in itself. This type of information is thought to be qualitatively different from activated content information, because feelings are *experienced* (e.g., Bless, 2002; Schwarz & Clore, 2007). When judging targets, individuals are thought to be asking themselves private questions such as “How do I feel about it?” (Schwarz & Clore, 1988), and then using this experiential information to form a variety of judgments (Pham, 2008). According to this account, affective feelings function as “internal signals that provide consciously available feedback” (Clore, Wyer et al., 2001, p. 30; see also Morris, 1989, for an overview). The affect-as-information account thus holds (a) that judgments can be genuinely *feeling*-based, (b) that feelings influence judgments *directly*, and (c) that the reliance on feelings in judgment is inferential rather than purely automatic (Pham, 2004). We will refer to this account as the *feelings-as-information* or FI-account.

The second type of account posits that affective feelings influence judgments by influencing the *content* that comes to mind (e.g., Bower, 1981; Forgas, 1995a; Forgas & Bower, 1987; Isen, Shalke, Clark, & Karp, 1978). This account holds that affective feelings are an integral part of cognitive representations and activate affectively congruent concepts

or memories by way of spreading activation in an associated network structure. It is this activated content information that is integrated into judgments. In this account the impact of feelings on judgments is thus posited to be *indirect* and mediated by the activation of content information. The judgment process implied by this account is not feeling-based but *content-based*, in that it is content (activated by affective feelings) that is integrated in judgments. In the present review, this perspective is called the *priming-account*.

In summary, the FI-account suggests a direct influence of feelings on judgments via experiential information, whereas the priming-account proposes an indirect influence via activated content information. Forgas (1995a) integrated both accounts into a multi-process model called the affect infusion model, which holds that both accounts coexist and complement rather than contradict each other (for a comparison, see Bless, 2001). Because this review focuses on the distinct experiential quality of feelings as input to judgment, it is restricted to studies in which the impact of affective feelings on judgments can be conceptualized as experiential rather than mediated by activated content information, that is, findings that either have been accrued within the FI-account or can be most parsimoniously reconciled with its tenets.¹

Cognitive feelings. Similar to affective feelings, cognitive feelings of ease-of-retrieval have been shown to influence a wide variety of judgments, such as frequency estimates (e.g., Greifeneder & Bless, 2008; Tversky & Kahneman, 1973), assertiveness judgments (e.g., Schwarz et al., 1991), attitudes towards political issues (e.g., Greifeneder & Bless, 2007; Ruder & Bless, 2003), health-related judgments (e.g., Raghurir & Menon, 1998), or product evaluations (e.g., Wänke, Bohner, & Jurkowitsch, 1997). Although this is only a short list (for reviews see Schwarz, 2004; Schwarz & Clore, 2007), it clearly shows that judgments *can* be influenced by such cognitive feelings.

With respect to the process underlying the effects of *cognitive* feelings of ease-of-retrieval, it has been generally assumed that cognitive feelings enter the judgmental process directly. Parallel to the affect-as-information account, individuals are thought to use cognitive feelings as a source of information other than relying solely on content information when

forming judgments of many kinds (e.g., Schwarz, 1998; Schwarz et al., 1991). Therefore, this perspective will also be referred to as fitting an FI-account.

Some findings pertaining to cognitive feelings can be attributed either to direct effects of the feelings, or to the use of activated thought content. Methods that allow the two types of explanations to be disentangled are therefore important. A widely used paradigm—hereafter referred to as the ease-of-retrieval paradigm—was introduced by Schwarz and colleagues (1991). In this paradigm, participants are asked to recall differential amounts of information, for instance, few versus many instances of previous assertive behaviors. Afterwards, participants are asked to form a related judgment, such as evaluating their own assertiveness. If individuals rely on their experiences of ease-of-retrieval, the recall of few examples, which is easy, will lead to higher ratings of assertiveness than the recall of many examples, which is difficult. After all, if it is easy (difficult) to come up with instances of one's own assertiveness, chances are that one is (is not) assertive. Such a pattern of results is generally referred to as an ease-of-retrieval effect. It is important to note that if individuals relied on the content of the information retrieved in forming their judgments, the recall of many (as opposed to few) examples would have resulted in higher perceptions of assertiveness. This pattern would be opposite to the results expected when relying on subjective feelings of ease-of-retrieval. Hence, patterns of results observed under Schwarz and colleagues' (1991) ease-of-retrieval paradigm are telling in regard to the underlying processes, a feature of particular importance in the present context.

Process tenets of the FI-account

Reflecting our interest in feelings as information, we next outline some core characteristics of the FI-perspective. Because moderating evidence can be diagnostic about underlying processes (Spencer, Zanna, & Fong, 2005), process assumptions may reversely allow for predictions about moderation. Following this logic, we build on the reviewed characteristics to derive general hypotheses about the types of variables that may be expected to moderate the reliance on affective and cognitive feelings in judgment.

Perhaps the most critical characteristic of the FI-perspective is that feelings are assumed to enter judgments as *information* inputs (e.g., Schwarz, 1990). Consequently, general principles that govern the integration of information in judgment (e.g., Anderson, 1981) should apply to the use of feelings, as well. For instance, given that inputs that are relatively more accessible are generally more influential in judgments (e.g., Feldman & Lynch, 1988; Sherman & Corty, 1984), one would expect that feelings are more likely to influence judgment when they are relatively salient compared to other pieces of information (moderator category 1). Likewise, because the impact of extraneous information sources is generally stronger the more malleable a judgment is, feelings should exert a stronger influence on judgments that are evaluatively malleable (moderator category 4).

Second, the FI-perspective generally assumes that feelings operate as *single* pieces of information that integrate a wide variety of information into a unified whole (e.g., Clore & Parrott, 1994; Koriat & Levy-Sadot, 1999; for supporting empirical evidence, see Greifeneder & Bless, 2007; Ruder & Bless, 2003). If this is the case, the conditions that govern the use of feelings in judgment may be similar to those that foster the reliance on other single pieces of information, such as heuristic cues. In particular, one would generally expect the reliance on feelings to be higher under conditions of low processing intensity (moderator category 5)—which is consistent with the assumption that the reliance on feelings is a lean process (e.g., Clore, Gasper, & Garvin, 2001).

Finally, the FI-perspective assumes that the use of feelings in judgment is governed by metacognitive assessments of perceived informational value (e.g., Avnet & Pham, 2007; Greifeneder, 2007; Schwarz, 2004). It is generally assumed that for a feeling to be perceived as a useful source of information, it needs to be perceived as emanating from or being about the judgmental target (“being representative”), as well as being relevant for the judgment in question (Pham, 1998). Accordingly, one would expect that metacognitive assessments in terms of both representativeness (moderator category 3) and relevance (moderator category 4) moderate the use of feelings in judgment.

While the above characteristics apply similarly to the reliance on affective and cognitive feelings, there is at least one notable difference: affective feelings generally seem to require less interpretation than cognitive feelings. For example, whereas a positive affective reaction toward a target is easily mapped onto a liking of this target, an ease experience while recalling information about the same target needs to be further interpreted, for instance, in terms of frequency (e.g., Greifeneder & Bless, 2007). Similarly, much of the meaning of affective feelings is about valence (the positivity or negativity of things, e.g., Schwarz & Clore, 2007; but see Lerner & Keltner, 2000; Raghunathan & Pham, 1999), whereas the meaning of cognitive feelings is potentially broader (e.g., being indicative of frequency, confidence, truth, etc.). This is consistent with recent theoretical suggestions that whereas cognitive feeling experiences are open to numerous possible interpretations (Schwarz, Song, & Xu, 2008), affective feelings seem to be interpreted in terms of a more restricted lexicon (Pham, 2008). Finally, whereas affective feelings can provide information about the target directly (e.g., “I feel uncomfortable around him: I should probably not trust him”), cognitive feelings such as those of ease-of-retrieval generally provide information in relation to some content about the target (e.g., “It is hard to *remember* when he last said ‘hello’ to me: he is probably an unfriendly person”). All three aspects pertain to the meaning of a feeling and may therefore result in differential moderation effects when the reliance on feelings depends on what a feeling means, as discussed in more detail later.

Conclusion

The first part of this review identified different kinds of feelings and highlighted their influences on a wide variety of judgments. It was noted that two major types of processes can account for the influence of affective and cognitive feelings on judgments: a feeling-as-information-account (FI-account), and a thought-priming (or content-activation) account. Given our focus on the distinct experiential quality of feelings (as opposed to content information), essential assumptions that characterize the use of feelings as information were reviewed and used to formulate broad hypotheses about likely moderators of the reliance on feelings in judgment.

Empirical Moderators of the Reliance on Feelings

In this second part, we review the conditions under which affective feelings and cognitive feelings influence judgment. This review is organized in terms of the three core components of this reliance: the feelings themselves (e.g., a positive or negative mood state), the target of the judgment (e.g., a politician), and the judgment itself (e.g., the politician's judged trustworthiness). First, focusing on the feelings themselves, we examine how the salience of the feelings moderates the reliance on these feelings. Second, focusing on the relation between the feeling and the target of the judgment, we examine how the degree to which the feelings are perceived to emanate from the target—that is, their representativeness—moderates the reliance on feelings. Third, focusing on the relation between the feelings and the judgment, we examine how the relevance of the feelings for the judgment moderates the reliance on feelings. Fourth, focusing on the nature of the judgment itself, we examine how the evaluative malleability of the judgment moderates the reliance on feelings. Finally, we examine how the intensity with which individuals engage in judgmental processes moderates the reliance on feelings. These five categories of moderators serve as major structural elements.

Note that by organizing the empirical evidence based on the way variables influence the reliance on feelings—for instance by changing perceptions of representativeness—rather than based on the variables themselves—for example, “expertise”—this review adopts a functional perspective rather than an operational one. This organization allows for a more coherent and parsimonious model of the reliance on feelings, which lends itself to testable predictions for future research. As a result, however, a given operational variable (e.g., expertise) may appear in different functional categories of moderators, depending on the role that the variable plays in a particular empirical finding. For instance, because expertise has been shown to influence both the perceived relevance of feelings and the malleability of judgments, this variable is discussed under both categories of moderators.

With this in mind, we now turn to the empirical evidence of five different categories of moderators of reliance on feelings: (1) the salience of the feelings, (2) the representativeness

of the feelings in relation to the target, (3) the relevance of the feelings to the judgment, (4) the evaluative malleability of the judgment, and (5) the level of processing intensity.

Salience of feelings

A growing number of findings suggest that feelings are more likely to influence judgment when *salient*. Salience is broadly defined here around the notion that some pieces of information are more attended to than others. Their being “more attended to” may be due to features inherent in the information itself (as suggested by Higgins, 1996; see also Taylor & Fiske, 1978), or to task characteristics or individual predilections that cause some pieces of information to “stick out” relative to other pieces of information (see also Feldman & Lynch, 1988; Sherman & Corty, 1984). In the case of the politician example introduced above, salience refers to the extent to which a positive or negative feeling “stands out” and is attended to more than other pieces of information.

The evidence on salience as a moderator is reviewed below, jointly for affective and cognitive feelings. A concise summary is provided in Table 1, separately for affective and cognitive feelings. A conceptual distinction is made between contextual sources of salience of feelings (context-related) and dispositional sources (disposition-related).

Context-related salience

Siemer and Reisenzein (1998) observed that judgments were influenced by positive and negative mood states more when the moods were assessed in a manipulation check prior to dependent variables. The manipulation check presumably increased the salience of participants’ affective experiences, thereby increasing the likelihood that these were used in judgment (see also White & McFarland, 2009). Similarly, with respect to cognitive feelings, Kühnen (2010) found that ease-of-retrieval effects were confined to conditions in which feelings of ease-of-retrieval were assessed as a manipulation check before the dependent variables.²

Albarracín and Kumkale (2003, Exp. 3) further observed that explicitly focusing participants’ attention on their affective reactions increased the impact of incidental affective

feelings on attitudinal judgments, presumably due to heightened salience of the feelings. However, this effect occurred only for participants low in processing intensity, as participants with higher levels of processing intensity were expected to realize the undue influence of their incidental feelings and therefore discount them as unrepresentative. Interestingly, when individuals were not focused on their feelings, incidental feelings had a stronger influence on judgment when processing intensity was moderate compared to when it was low (Albarracín & Kumkale, 2003, Exp. 1 and 2). This is presumably because when the salience of feelings is not increased experimentally, some processing intensity is needed to identify feelings as a potential source of information. It is only when even higher levels of processing intensity are reached that the above-described discounting for lack of representativeness takes place (for further details on Albarracín and Kumkale's 2003 model, see the section on processing intensity).

In the above studies, salience was increased by means of manipulation checks or explicit instructions. Using a more subtle approach, Raghubir and Menon (2005, Exp. 2) influenced the salience of *cognitive feelings* by varying context information. Participants who had recalled either two or ten instances of eating out at a restaurant were asked to indicate the amount of money spent during these outings. When the instances were to be recalled from a *recent past*, participants reported spending higher amounts of money after recalling two instances than after recalling ten, reflecting an ease-of-retrieval effect. However, when the instances to be recalled were from a *distant past*, the pattern reversed. This is presumably because people expect older memories to be difficult to retrieve, rendering the experience of difficulty of retrieval no longer salient. Extending these findings, Hansen and Wänke (2008) found that experiences of ease-of-retrieval are more likely to influence judgments if these experiences are discrepant from an implicit standard or expectation. In one study, participants were semantically primed with concepts of ease or difficulty before ease-of-retrieval was manipulated. Consistent with the notion that the contextual salience of feelings moderates their influence on judgments, the authors found that feelings of ease-of-retrieval influenced judgments especially when these feelings were discrepant from the

primed standard. Presumably this is because feelings of ease-of-retrieval, and signals in general, are more likely to be detected and used if salient (see also Whittlesea & Williams, 1998).

Disposition-related salience

A growing number of findings suggest that dispositional variables may also influence whether affective and cognitive feelings “stick out” and therefore are relied on. For instance, Gasper and Clore (2000, Exp. 1) manipulated participants’ incidental moods and further divided participants into two groups, based on their tendency to pay attention to their feelings (assessed with a short version of the Trait Meta-Mood Scale; Salovey, Mayer, Goldman, Turvey, & Palfai, 1995). The authors found that the incidental mood manipulation had stronger influence on judgments among participants with a chronic tendency to focus on their affective reactions. Haddock, Zanna, and Esses (1994) divided their sample based on affect intensity—a 40-item measure reflecting dispositional differences in the strength with which individuals experience affective feelings (Larsen & Diener, 1987)—and found more pronounced effects of incidental mood states on attitudes toward stereotyped groups for individuals who scored high on affect intensity.

Another instance of disposition-related salience is Pham’s (1998, Exp. 1) finding that reliance on affective feelings in decisions is greater among individuals categorized as visualizers as opposed to verbalizers (determined via the 22-item Style-of-Processing scale; Childers, Houston, & Heckler, 1985). Presumably this is because visualizers are more likely “to see how it feels” (Pham, 1998, p. 147), thus increasing the relative salience of affective reactions. Relatedly, Ciarrochi and Forgas (2000; Forgas & Ciarrochi, 2001) hypothesized and found that feelings influenced judgments particularly among participants scoring high as opposed to low in openness to feelings (determined via the eight-item Openness-to-Feelings scale; Costa & McCrae, 1985). Finally, Shiv and Fedorikhin (1999, Exp. 2) observed that integral affect toward the options influenced the choices of participants categorized as impulsive, but not those of participants categorized as prudent (based on three items from the Consumer Impulsiveness Scale; Puri, 1996). This is presumably because, compared to

prudent individuals, the focus of impulsive individuals may be narrowed to affective reactions, especially when processing resources are scarce.

Conclusion

The reliance on affective feelings and cognitive feelings appears to similarly depend on the salience of the feelings. Specifically, the impact of feelings on judgments seems to be stronger when the feelings are relatively salient. This relative salience is determined by both contextual variables and personality characteristics. Although the evidence to date in the domain of cognitive feelings is limited to contextual variables, it seems likely that future research will show that dispositional determinants of the salience of cognitive feelings have similar moderating effects.

On the surface, the above findings seem to conflict with the well-established affect-as-information finding that directing people's attention to the actual source of their *incidental* mood states typically *reduces* (rather than increases) the impact of these mood states on judgments (e.g., Gorn, Goldberg, & Basu, 1993; Schwarz & Clore, 1983). However, Siemer and Reisenzein (1998; see also White & McFarland, 2009) convincingly argue that this conflict is only apparent, as the salience of one's *feelings* needs to be differentiated from the salience of the *cause* of one's feelings. Misattribution studies in the feelings-as-information literature typically manipulate the salience of the *cause* of the incidental feelings (e.g., the weather or music, Schwarz & Clore, 1983), whereas the findings reviewed above pertain to the effects of the salience of the feelings themselves. Still, it may appear surprising that similar operationalizations, such as assessing the manipulation check prior to dependent variables, either increase the salience of feelings themselves, or increase the salience of the cause of the feelings, eventually resulting in opposite judgment outcomes. Recent theorizing by Albarracín and Kumkale (2003) offers a way to reconcile this seeming puzzle. The authors suggest that in order for feelings to influence judgments, feelings need to be both identified and perceived as representative of the target. In the Siemer and Reisenzein (1998) and White and McFarland (2009) studies, the salience manipulations presumably helped the incidental feelings to be identified without undermining their perceived representativeness. In

contrast, in typical affect-as-information misattribution studies such as Schwarz and Clore's (1983), salience manipulations were such that incidental feelings were not only identified, but also perceived to be non-representative of the target.

The finding that the salience of feelings itself increases the feelings' influence on judgment also appears to conflict with the well-documented finding that even mood manipulations that are very subtle and seemingly weak often suffice to influence judgments (e.g., Isen & Levin, 1972; Isen et al., 1978; Schwarz & Clore, 1988). Again, this conflict is only apparent, because while stronger feelings tend to be more salient, the salience of feelings is not solely determined by their intensity. A feeling experience may be very subtle, yet salient if some factors make it stand out in the attention field. Similarly, a feeling experience may be intense, yet not salient if other pieces of information are more attention-grabbing.

Representativeness of feelings

A second category of moderators emerges from findings showing that feelings are more likely to be relied on in judgment when the feelings are perceived to be *representative* of the target in question. Representativeness is defined as the degree to which a feeling is perceived to emanate from the target and reflect essential characteristics of the target. In the politician example mentioned earlier, representativeness would refer to the degree to which the positive or negative feelings appear to be caused by and are informative about the politician (the target). The notion of representativeness is to be differentiated from the notion of *relevance*, discussed in the next section, which holds that there may be differences in the perceived materiality of feelings for a judgment, independent of their representativeness (see also Pham, 2008). Note that the distinction between representativeness and relevance is well established in the literature on affective feelings (Pham, 1998; White & McFarland, 2009), and parallels, for instance, Schwarz and Clore's (2007) differentiation between "perceived informational value" and "perceived relevance."³ Both representativeness and relevance have been conceptualized as metacognitive assessments (e.g., Avnet & Pham, 2007; Bless & Schwarz, 2010).

Studies investigating the moderating impact of representativeness can be categorized into two groups. Some studies primarily manipulate whether the feelings are perceived to emanate from the target. These studies are here referred to as examining “backward-representativeness,” in that the direction of inference is from the feelings *back* to the target (“Are my feelings *caused by X*?”). In the politician example, backward-representativeness would refer to whether the feelings are perceived to be caused by the politician. Other studies primarily focus on whether a given feeling is perceived to be *applicable* to a specific target. These studies are here referred to as examining “forward-representativeness,” in that the direction of inference is from the feeling to the target (“Are my feelings telling me something *about X*?”). In the politician example, forward-representativeness would refer to whether a given feeling experience appears to be informative about a specific politician.

As will be apparent, the moderating role played by representativeness has been observed with a variety of methodological operationalizations. The findings show that representativeness is not necessarily “all or nothing”—such as when people realize or believe that the real cause of their feelings is unrelated to the target (e.g., Schwarz et al., 1991; Schwarz & Clore, 1983); rather, it is often a matter of degree—such as when some feelings appear to be more representative for a given target than other feelings, or when given feelings seem to be more representative for some targets than for other targets (e.g., Raghunathan, Pham, & Corfman, 2006). A concise overview of the reviewed evidence is provided in Table 2.

Backward-representativeness

The very idea of feelings-as-information implies that feelings are used as information only to the extent that they are deemed informative with respect to the target. If there is reasonable doubt, feelings should not be used as a basis for judgment. Consequently, if one wants to demonstrate that feelings are used as information (instead of feelings exerting their influence via priming or automatic evaluative conditioning), a compelling methodology would be to discredit the feelings’ perceived informational value. Very often, this is achieved by providing a plausible cause for the feeling that is unrelated to the target, thus making the

feelings unrepresentative of the target. In their classic work, Schwarz and Clore (1983) manipulated the representativeness of positive and negative incidental affective feelings by introducing an alleged extraneous cause for the feelings (a soundproof room supposedly known to induce certain feelings), or by making the feelings' actual source, the outside weather conditions, salient. These manipulations moderated the influence of participants' mood states on judgments such as happiness and life satisfaction. Findings such as these are consistent with the FI-account, but not with the processes of automatic spreading-activation postulated in the priming-account, because the latter should be insensitive to representativeness.

Given that providing a plausible alternative cause for the feeling that is unrelated to the target allows researchers to differentiate between the FI- and the priming-account, it comes as no surprise that this experimental paradigm has been used extensively in the literature, both with incidental affective feelings (e.g., Schwarz & Clore, 1983) and integral affective feelings (e.g., Pham, 1998, Exp. 3). Rather than listing all of these findings, it appears worthwhile to reflect on why providing a plausible alternative cause for the feelings has such a powerful moderating impact. Key to this question is the concept of *attribution*, which holds that for a feeling to influence judgment, it needs to be attributed to the target in question. This process is thought to be automatic (e.g., Whittlesea, Jacoby, & Girard, 1990) and largely unconstrained (e.g., Bornstein & D'Agostino, 1994; Schwarz, 2004; Schwarz & Clore, 1996). Moreover, it is controlled by whatever is salient and applicable at the time of attribution (temporal contiguity), including the current task to be performed and contextual factors (e.g., Winkielman, Schwarz, Fazendeiro, & Reber, 2003). As a result, affective feelings are typically experienced as immediate reactions to whatever the focus of attention is at the time of experience—"Why else would I be feeling that way at this moment?"—a tendency known as the immediacy principle (Clore, Wyer et al., 2001) or the aboutness principle (Higgins, 1996). In general, this default assumption is accurate and adaptive. However, it is not infallible and can be tricked by skilled experimentation, as reflected in the large number of studies relying on variants of the misattribution principle.

Paralleling the findings obtained in the domain of affective feelings, a large body of empirical evidence suggests that cognitive feelings are not relied upon in judgment if they are attributed to a source that is unrelated to the target. For instance, Schwarz and colleagues (1991, Exp. 3) provided half of their participants with an alternative explanation for their cognitive feelings. This manipulation reduced the impact of feelings on subsequent judgments, presumably because participants perceived their cognitive feelings to be no longer representative of the target in question (see also Wänke, Schwarz, & Bless, 1995). As with affective feelings, findings that the influence of cognitive feelings depends on attributions about the source of the feelings are generally taken as evidence that cognitive feelings are used as information in judgment formation. Of greater interest than the sheer number of studies documenting such findings is the great variety of alleged sources for the cognitive feelings that researchers have provided to participants in these studies. For instance, supposed alternative sources for participants' feelings of ease-of-retrieval include curved boxes (Ruder & Bless, 2003, Exp. 3), background color (Greifeneder & Bless, 2007, Exp. 3), alleged lack of expertise (Sanna & Schwarz, 2003), or alleged general experiences of other participants (Menon & Raghurir, 2003, Exp. 2; Raghurir & Menon, 2001; Winkielman, Schwarz, & Belli, 1998). That such a diverse set of explanations all produce similar reductions of the effects of cognitive feelings attests to the general nature of this phenomenon.

While the studies reviewed so far varied backward-representativeness by manipulating the ostensible cause of the feelings, other studies employed more subtle manipulations. For instance, Keltner, Locke, and Audrain (1993, Exp. 3) induced participants to attribute negative affect either to the self ("How anxious do you feel about X?") or to the situation ("How anxious does X make you feel?"). The authors observed that negative feelings reduced satisfaction judgments only for self- but not situation-referent attributions, presumably because the feelings, once attributed to the situation, were not perceived to be representative for judging satisfaction. In a similar vein, McFarland, White, and Newth (2003) reported that target-unrelated feelings influenced social judgments only for participants

unaware of this biasing impact. Finally, Ottati and Isbell (1996) found that incidental affective feelings influenced the evaluation of a political candidate in assimilative fashion only among individuals with low expertise; among individuals with high expertise, a contrast effect occurred. This is presumably because expert individuals were more likely to recognize that their incidental feelings were not caused by the target being evaluated, prompting an attempt to subtract the incidental feelings from the judgment and causing a contrast effect (Martin, Seta, & Crelia, 1990).

Forward-representativeness

Representativeness depends not only on people's attributions about the (undue) cause of their feelings, but also on whether the feelings are perceived to be related or *applicable* to the specific target (a "forward" inference, from feeling *to* target). For instance, Gasper and Clore (1998, Exp. 2) reported that incidental feelings of anxiety influenced likelihood judgments of personal risks (e.g., getting into conflict with one's parents), but not impersonal risks (e.g., general increases in HIV deaths). This is presumably because participants experienced their feelings of anxiety as related to their own risks, but not to general risks, producing different levels of perceived representativeness.

Qiu and Yeung (2008) observed that when multiple options were presented sequentially, incidental feelings influenced only the first option to be evaluated. Apparently, once feelings are attributed to a target, they are no longer perceived to be representative of subsequent targets. Another operationalization of forward-representativeness was suggested by Raghunathan and Pham (1999, Exp. 3), who hypothesized that individuals consider their feelings to be more representative when making decisions for themselves than when making decisions for others. Consistent with this prediction, these authors found that feelings of anxiety versus sadness influenced participants' preferences more strongly when participants were deciding for themselves than when they were deciding for someone else. Similarly, Hsee and Weber (1997; Loewenstein et al., 2001) found that participants' predictions of risk preferences were more risk-averse for themselves than for (unknown) others, supposedly because integral feelings associated with risky options are perceived to be representative of

one's own risk preferences, but not of those of unknown others. In a related manner, Gorn and colleagues (2001, Exp. 2) observed that incidental affective feelings influenced judgments more strongly when individuals made self-referent evaluations (e.g., "I like the ad") than when they made object-referent evaluations ("The ad is good").

In the domain of *cognitive feelings*, Raghubir and Menon (1998) reported that recalling few (which is easy) versus many (which is difficult) AIDS-related behaviors increased participants' perception of their own risk of contracting AIDS. Presumably this is because when it is easy to come up with AIDS-related behaviors, people infer that there are probably many, suggesting a proneness to risk. Raghubir and Menon additionally found that this manipulation influenced participants' perceptions of risk for themselves, but not for other individuals. The authors reasoned that feelings of ease or difficulty associated with the recall of instances of one's own AIDS-related behaviors are representative only for judging one's own risk, but not for judging other individuals' risk (for conceptually related evidence, see Caruso, 2008) .

Adopting a different approach, Rothman and Hardin (1997) suggested that the perceived representativeness of cognitive feelings with respect to judgment targets comes from learned patterns of information use. They found that cognitive feelings of ease or difficulty of retrieval had stronger influence on judgments about outgroups and close friends than on judgments about ingroups and casual acquaintances. According to the authors, this is because judgments about outgroups and close friends are habitually related to feelings, rendering feelings representative, whereas judgments about ingroups and about casual acquaintances are habitually based on content information.

Combinations of backward- and forward-representativeness

Some studies also combine backward- and forward representativeness. For instance, Keltner, Locke, and Audrain (1993, Exp. 2) had participants attribute their current affective feelings either to the exam they had just taken or to things in general. Subsequently, participants were asked to evaluate their personal as well as their academic satisfaction. The authors hypothesized that attributing feelings to the exam should increase the

representativeness of feelings for evaluating academic satisfaction, but not for evaluating personal satisfaction. In contrast, attributing feelings to things in general should increase the representativeness of feelings for personal but not academic satisfaction. As expected, the feelings influenced satisfaction only when the target matched the attributed source of the feelings. This is presumably because the feelings were perceived to be representative of the target only when there was a match.

In a similar vein, Raghunathan, Pham, and Corfman (2006, Exp. 2) varied the relatedness between the domains in which feelings of anxiety or sadness were induced and the target domains. Specifically, participants were asked to form two decisions. One decision concerned trying a new drug, which involved a domain related to the source of anxiety (which was also health-related), but not related to the source of sadness (which was linked to the loss of someone close). The other decision was about spending time with a friend, which involved a domain related to the source of sadness (due to the loss of a close relationship), but not related to the source of anxiety. As expected, there was a more pronounced impact of either type of feelings when the domains of the feelings and the targets matched than when the domains did not match (for conceptually related evidence, see Shen & Wyer, 2008).

Conclusion

A vast body of evidence indicates that both affective and cognitive feelings are more likely to be relied on in judgments when they are perceived to be *representative* of the target in question. This representativeness is a function of a variety of factors that fall into two categories: those primarily related to the perceived cause of the feelings (backward-representativeness), and those primarily related to the perceived applicability of the feeling to the target (forward-representativeness). The large number of studies reviewed here and the large variety of operationalizations employed across studies attests to the importance of representativeness as a moderator of the reliance on feelings. It is noteworthy that very similar effects of representativeness have been obtained both in the domain of affective

feelings and in the domain of cognitive feelings (although the evidence is less extensive in the latter).

Besides documenting an important moderator of the reliance on feelings in judgment, the considerable empirical evidence about the effects of representativeness speaks to a fundamental conceptual difference between the FI- and the priming-account. According to the priming-account, whether or not individuals perceive their mood states as representative should not matter in how these states influence judgments. This is because the mood state should increase the accessibility of mood-congruent materials regardless of the perceived source of the mood state. In contrast to this priming-account prediction, the present review indicates an enormous impact of representativeness, which strongly favors a feeling-as-information interpretation of these effects. Therefore, while we acknowledge that mood-congruent judgments can be caused by the increased accessibility of mood-congruent material, the evidence reviewed here strongly supports the FI-perspective.

Relevance

A third category of moderators emerges from findings showing that feelings may or may not be used in forming a judgment, depending on whether the feelings are perceived to be relevant. Whereas representativeness refers to the relation between the feelings and the target (see previous section), relevance refers to the relation between these feelings and the *judgment*. Relevance and representativeness are therefore conceptually independent (Pham, 1998; see also Schwarz & Clore, 2007). Returning to the politician example, assuming that the feelings are perceived to emanate from the target (i.e., be representative), relevance refers to the degree to which these feelings are perceived to be informative for judging a particular dimension about the politician, for example his or her trustworthiness.

As with their salience, the relevance of feelings depends on both contextual factors (context-related relevance) and dispositional characteristics of the person forming the judgment (disposition-related relevance). For instance, feelings toward a given person that are deemed representative may appear more relevant when judging this person's trustworthiness in the context of a personal relationship than in the context of a business

transaction (context-dependent relevance). Likewise, in judging a person's trustworthiness, feelings may appear more relevant to individuals who generally believe in their feelings when making judgments than to those who are generally skeptical of feelings' evidentiary status (disposition-related relevance). A concise overview is provided in Table 3.

Context-related relevance

What appears *relevant* in a given situation depends, among other factors, on the evaluator's goals. Consequently, the evaluator's goals are likely to moderate the impact of feelings on judgments. Putting these conjectures to the test, Pham (1998) investigated participants' reliance on affective feelings in judgments of the intention to go to a movie. Participants who were induced into a positive or negative mood state were given either a consummatory motive to see a movie (e.g., to have a good time), or an instrumental motive (e.g., to qualify for another study). Participants' affective feelings were found to influence their movie-going intentions when they had consummatory motives, but not when they had instrumental motives. This is presumably because the experienced feelings were perceived to be relevant only when participants had consummatory motives. Importantly, in both goal conditions, participants were led to attribute their feelings to the movie itself (as opposed to an unrelated source). Thus, the incidental feelings were equally representative for the judgment in question, but apparently not equally relevant, thus exemplifying the conceptual independence of relevance versus representativeness (for conceptually related evidence, see Adaval, 2001; Yeung & Wyer, 2004).

Related findings by Geuens, Pham, and De Pelsmaker (2010) suggest that context-related relevance is assessed with great efficiency and flexibility. In their study, consumers were asked to watch 20 to 50 TV commercials and to indicate their attitude toward each advertised brand. Separate coders rated both the emotional content of each ad and the hedonic-versus-utilitarian nature of each advertised product or service. Analyses revealed that consumers' brand attitudes were more influenced by emotional content when the advertised product or service was hedonic than when it was utilitarian. This interaction between the emotional content of the ad and the product's or service's category is

noteworthy, considering that respondents saw a large number of commercials in a row and were not explicitly asked to pay attention to the emotional content of the ad, or to the hedonic/utilitarian nature of each advertised product or service. Thus, it appears that respondents spontaneously adjusted their brand-attitude judgments according to the perceived relevance of their feelings.

Further support for the important role of goals was obtained in the context of basic regulatory motives. According to regulatory focus theory (Higgins, 1997), goal pursuit can be undertaken with two distinct self-regulatory orientations known as promotion and prevention. A promotion focus, which is typically associated with the pursuit of ideals (wishes and aspirations), encourages an eager form of self-regulation that emphasizes approach strategies and means. In contrast, a prevention focus, which is typically associated with the pursuit of oughts (duties and obligations), encourages a vigilant form of self-regulation that emphasizes avoidance strategies and means. Pham and Avnet (2004, Exp. 1 to 3) hypothesized and found that priming ideals (a promotion focus) encourages the reliance on affective feelings in judgment, whereas priming oughts (a prevention focus) discourages it (see also Pham & Avnet, 2009, Exp. 3 and 4). Additional results further show that this is because feelings are perceived to be more informative under a promotion focus than under a prevention focus (Pham & Avnet, 2004, Exp. 3), and that promotion-focused individuals are more likely to rely on their feelings when these feelings are perceived to be relevant than when they are perceived to be irrelevant (Pham & Avnet, 2009, Exp. 3).

Relatedly, Bosmans and Baumgartner (2005) found that when achievement goals were salient, achievement-related feelings (cheerfulness vs. dejection) exerted a stronger impact on judgments than protection-related feelings (quiescence vs. agitation). The effect reversed when protection goals were salient. This is presumably because feelings were perceived to be more informative and relevant when compatible with the person's active goals.

Other contextual operationalizations of the relevance of feelings involve explicit task instructions to either rely on or not rely on feelings in judgment. For instance, Gasper and

Clore (2000, Exp. 2) found that affective feelings influenced judgments when participants were instructed to use their feelings as a basis for judgment, but not when they were instructed to use factual knowledge (see also Pham, 1998, Exp. 2). Presumably this is because feelings were deemed less relevant when participants were told to form a judgment based on factual knowledge. Subsequent replications and conceptual extensions show that this result is robust (Adaval, 2001, Exp. 2; Scarabis, Florack, & Gosejohann, 2006; White & McFarland, 2009, Exp. 1).

Context-related relevance is also apparent in studies conducted by Avnet and Pham (2007), who observed that the perceived relevance of affective feelings depends on the individual's subjective history of success when relying on feelings as information. The authors theorized that prior success in using affective feelings as information influences the trust that individuals have in their feelings, and consequently the relevance they perceive for the judgment at hand. Consistent with this hypothesis, affective feelings were relied upon more when participants were led to believe that they had been successful in their past reliance on their feelings than when they were led to believe that they had been unsuccessful. This is presumably because a belief in successful previous reliance on feelings as information increased participants' trust in their feelings and the feelings' perceived relevance in subsequent judgments.

Finally, Chang and Pham (2010) hypothesized and found that both integral and incidental affective feelings are more influential in decisions set in the present than for decisions set in the future. One possible explanation is that current feelings are perceived to be more relevant when judging targets that are immediate rather than targets that are more distant.

Interestingly, the perceived relevance of feelings may also be contextually determined by other feelings: those arising from the person's (incidental) affective state. In particular, Ruder and Bless (2003) hypothesized and found that *cognitive* feelings of ease-of-retrieval have a stronger effect on judgments among happy individuals than among sad individuals. Presumably this is because happy individuals, compared to sad individuals, are more likely

to rely on general knowledge structures when forming judgments (Bless et al., 1996), as they perceive general knowledge structures to be more informative or relevant. Consistent with the conceptualization of reliance on ease-of-retrieval as a heuristic process (e.g., Tversky & Kahneman, 1973), the tendency to rely on general knowledge structures under happy mood states may be expected to foster the reliance on cognitive feelings of ease-of-retrieval, as observed by Ruder and Bless (2003). Processing latencies results further showed that happy participants took similar amounts of time to form judgments after retrieving few versus many pieces of information, presumably because cognitive feelings of ease or difficulty are single pieces of information (e.g., Koriat & Levy-Sadot, 1999). In contrast, sad participants took more time after retrieving many rather than few pieces of information, presumably because forming content-based judgments takes more time the more pieces of information need to be integrated.

Disposition-related relevance

The perceived relevance of feelings in judgments also appears to depend on dispositional factors, with different feelings being perceived as more relevant by some individuals than by others. One dispositional determinant of the perceived relevance of momentary feelings is the person's chronic feeling state. Gasper and Clore (1998) theorized that the reliance on momentary feelings increases when these feelings match people's chronic feeling states (trait-affect), because trait-consistent feelings should be perceived to be more informative than trait-inconsistent feelings. In line with this proposition, these researchers found that compared to individuals scoring low in trait anxiety (determined via the State Trait Anxiety Inventory; Spielberger, Gorsuch, & Lushene, 1970), individuals scoring high in trait anxiety were more influenced by their momentary feelings of anxiety in judgments of risks, even if it was made salient to them that the source of their momentary feelings was unrelated to the target. This is presumably because trait anxiety makes momentary feelings of anxiety seem more informative, even if the representativeness of these feelings has been questioned.

A second dispositional factor that has been shown to moderate the perceived relevance of feelings is the individual's chronic regulatory focus. Extending the finding that primed ideals (promotion focus) and oughts (prevention focus) moderate reliance on affective feelings, Pham and Avnet (2004, Exp. 4) hypothesized that a chronic promotion focus would also encourage the reliance on affective feelings, whereas a chronic prevention focus would discourage it (as determined via the Selves Questionnaire; Higgins, Roney, Crowe, & Hymes, 1994). Conceptually replicating the findings on primed regulatory foci, it was found that chronically accessible ideals increased the influence of affective feelings on judgments, whereas chronically accessible oughts decreased it (see also Pham & Avnet, 2009, Exp. 1 and 2).

The perceived relevance of and reliance on feelings is also moderated by individuals' self-esteem or self-worth. Harber (2005) hypothesized that individuals high in self-esteem or self-worth rely more on their feelings in judgments because they have stronger faith in their inner reactions, which therefore seem more relevant when forming a judgment. To test this hypothesis, Harber divided participants into groups of high versus low self-esteem (Exp. 1 and 2, based on the Rosenberg Self-Esteem Scale; Rosenberg, 1965), or manipulated participants' momentary self-worth (Exp. 3). In line with the hypothesis, higher levels of self-esteem or self-worth were associated with stronger affective influences on individuals' judgments.

Another disposition known to moderate the perceived relevance of feelings is domain expertise. In the realm of cognitive feelings, Ofir (2000) observed that feelings of ease-of-retrieval have stronger influence on judgments among individuals with low expertise in the judgment's domain than among individuals with high expertise. In this study, two groups of participants, auto mechanics (experts) and mere holders of driver's licenses (laymen), were asked to generate either few or many causes for car breakdowns, and then to estimate the frequency of car breakdowns. As expected, whereas the frequency judgments of laymen were influenced by feelings of ease-of-retrieval, those of experts were not (see also Florack

& Zoabi, 2003). This is presumably because experts find their feelings to be relatively less relevant given that they can also tap into their factual knowledge as a basis for judgment.

Extending these findings, Tybout, Sternthal, Malaviya, Bakamitsos, and Park (2005) suggest that the reliance on feelings of ease-of-retrieval is highest under moderate levels of expertise and lower under either low or high levels of expertise. This is because the ease of retrieval experienced by experts and the difficulty of retrieval experienced by novices both seem uninformative and therefore irrelevant for the judgment. In contrast, ease or difficulty experiences under medium levels of expertise are informative and hence perceived to be relevant. Although these findings seem to conflict with Ofir's (2000) and Florack and Zoabi's (2003) conclusions that reliance on cognitive feelings is stronger under low levels of expertise, this apparent inconsistency may be due to differences in definitions of what constitutes low versus medium levels of expertise across studies. Close inspection of these studies' methodologies seems to suggest that the medium level of expertise in Tybout and colleagues' (2005) studies was comparable to the low level of expertise in the earlier studies, which would reconcile the conflicting sets of results.

The perceived relevance of cognitive feelings also depends on the person's trait affect. Extending Ruder and Bless' (2003) findings from the domain of momentarily induced mood states to the domain of chronic trait-level affect, Greifeneder and Bless (2008) observed an effect of ease-of-retrieval experiences on judgments among non-depressed individuals, but not among depressed individuals (as determined using the Allgemeine-Depressions-Skala or the Beck-Depression-Inventory; Hautzinger & Bailer, 1993; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961, respectively). As for momentary affective states (Ruder & Bless, 2003), this finding is likely due to depression decreasing the perceived relevance of cognitive feelings of ease or difficulty.

Furthermore, the perceived relevance of cognitive feelings is a function of the person's faith in intuition, which is his or her chronic tendency to rely on intuition (Epstein, Pacini, Denes-Raj, & Heier, 1996). Keller and Bless (2008) hypothesized and found that high levels of faith in intuition were associated with greater reliance on cognitive feelings as

information compared to low levels of faith in intuition (groups divided based on Faith in Intuition scale; Epstein et al., 1996). This is presumably because compared to those with low faith in intuition, individuals with high faith in intuition have greater trust in their experiential reactions and therefore perceive their feelings to be more relevant when forming judgments.

Finally, also consistent with the notion of disposition-related relevance, Weick and Guinote (2008) observed that judgments of powerful individuals exhibited stronger reliance on ease-of-retrieval experiences than judgments of non-powerful individuals. According to the authors, this is because powerful individuals feel free to make judgments based on subjective information, including feelings, whereas individuals with less power feel a need to pay attention to multiple cues to increase control (Guinote, 2007).

Conclusion

The diverse set of findings reviewed in this section suggests that feelings are relied upon more when they are perceived to be relevant for the judgment than when they are perceived to be less relevant. This relevance may stem from a variety of sources that can be grouped into two broad categories: those related to the context of judgment formation, and those related to the person forming the judgment. Again, a high degree of parallelism was observed between the domain of affective feelings and the domain of cognitive feelings.

Paralleling our conclusion on representativeness, it is noteworthy that the evidence about the effects of relevance is difficult to reconcile with mere automatic spreading activation as postulated in the priming-account. This is because mere spreading activation should not be responsive to the feelings' perceived materiality for the judgment. Yet, the findings reviewed here demonstrate an enormous impact of relevance, thus supporting the FI-perspective.

Looking at both representativeness (previous section) and relevance, it is instructive to note the surprising variety of variables with which both principles have been operationalized. This diversity of operationalizations attests to the importance of representativeness and relevance as general moderators of the reliance on feelings. This diversity further suggests that the reliance on feelings as information in judgment is a rather

flexible process (Pham, 2004), which may not be readily apparent when examining individual studies in isolation, but becomes very apparent when considering all these studies together. Finally, this diversity allows for the conclusion that the metacognitive assessments of representativeness and relevance are well-tuned processes that take into account a host of external and internal information, including their interrelation, before a specific feeling is used in a given judgment.

While the metacognitive assessments of representativeness and relevance share the above characteristics of flexibility and efficiency, they appear to differ with respect to their assumed *default* value. For representativeness, it has been suggested that the default value is “yes”: that is, feelings are assumed to be representative unless there is evidence to the contrary. Because feelings are generally experienced in close temporal contiguity with the objects that elicit them, people tend to assume that their feelings arise from (i.e. “represent”) whatever happens to be the focus of their attention (immediacy principle, Clore, Wyer et al., 2001; aboutness principle, Higgins, 1996). Only if there is doubt is the default assessment converted to “unrepresentative.” In contrast, it appears that there is no strict default for relevance. Rather, relevance seems to be assessed very flexibly, depending on various external and inner conditions, as reviewed above (see also Pham, 2008).

Evaluative malleability of judgments

The fourth category of moderators comprises a large body of empirical evidence indicating that feelings exert a stronger influence on judgments that are evaluatively malleable. That is, the link between feelings and judgments is stronger when judgments are more open to extraneous influences. Returning to the politician example, evaluative malleability refers to the degree to which judgments of trustworthiness are changeable. Variations in evaluative malleability can be of two types. First, differences in malleability may stem from *differences across judgment dimensions*: some kinds of judgments are more evaluatively malleable than others (judgment-related malleability). For instance, judgments of trustworthiness are presumably more malleable than judgments about gender. Second, differences in malleability may stem from *differences across targets*: judgments about certain

targets are more open to extraneous influences than those about other targets (target-related malleability). For instance, judgments about the trustworthiness of Politician A may be more influenced by feelings than judgments about the trustworthiness of Politician B. Table 4 provides a concise overview.

The notion of evaluative malleability parallels theorizing about the notion of *judgment construction*. Fiedler (1991), among others, suggested that feelings are more likely to have an impact on judgments (a) if no prior judgment has been stored in memory or is readily accessible, and (b) if the judgmental domain is rather unstructured, novel, ambiguous, or general, all of which require online judgment construction. A similar perspective can be found in the affect infusion model (Forgas, 1995a), which draws a distinction between constructive judgment strategies that are open to the infusion of contextual affect, and nonconstructive judgment strategies that reduce the likelihood of affect infusion. Although not necessarily implied, the degree of judgment construction may be perceived as depending on the intensity of processing, which has separate effects on the reliance on feelings in judgment (as shall be discussed further). To avoid such a confound and to underscore that the following section pertains to aspects of the judgment itself, we prefer the label *evaluative malleability*.

Judgment-related malleability

Several lines of research suggest that some judgments are more evaluatively malleable than others and therefore more influenced by affective feelings. It has been found, for instance, that judgments of general life satisfaction are more influenced by incidental affective feelings than judgments of satisfaction with specific life domains (Schwarz, Strack, Kommer, & Wagner, 1987). Presumably this is because the judgment criteria for assessing one's general life satisfaction are less well-defined; and as a result, such general judgments may be influenced by more diverse sources of information, including affective feelings. In contrast, the criteria for assessing one's satisfaction with more specific life domains such as work are better defined (e.g., salary, rank), making such specific judgments less malleable and therefore less open to the influence of feelings (for conceptually similar evidence, see Gorn et al., 1993).

Replicating these findings with inter-individual judgments, Forgas (1990) observed that the influence of incidental mood states is more pronounced for global evaluative judgments (e.g., likeable, dislikeable) than for more specific judgments (e.g., intelligent-dull). Similarly, Sedikides (1995) found that peripheral self-conceptions were more influenced by affective feelings than central self-conceptions. This is presumably because peripheral self-conceptions are “relatively low in personal descriptiveness” (p. 760) and less important to the self, and therefore more malleable, whereas central self-conceptions are “relatively high in personal descriptiveness” (p. 760) and more important to the self, and therefore less malleable. In a related vein, Forgas and Tehani (2005) observed that when giving performance feedback to someone, staff members were more influenced by their incidental mood states than managers. This is presumably because staff members, unlike managers, did not have well-established scripts for giving performance feedback, making their judgments more malleable to extraneous influences.

In the domain of cognitive feelings, Dijksterhuis, Macrae, and Haddock (1999) hypothesized that the influence of feelings of ease-of-retrieval on judgments would depend on the extremity of prior attitudes. Participants were asked to generate either few or many traits on which men and women differ. They were then asked to imagine a female secretary and to describe her. The stereotypicality of these portrayals was then rated. Participants were categorized as low-prejudiced, medium-prejudiced, and high-prejudiced individuals based on their responses to the Modern Sexism Scale (Swim, Aikin, Hall, & Hunter, 1995). The results show that the secretary portrayals offered by low-prejudiced individuals were the most affected by experiences of ease-of-retrieval. According to the authors, this is because low-prejudiced individuals were more likely to construct judgments online, whereas medium- or high-prejudiced individuals were more likely to recruit previously formed attitudes. The judgments by low-prejudiced individuals were therefore more malleable and open to extraneous influences such as cognitive feelings.

Relatedly, Haddock, Rothman, Reber, and Schwarz (1999, Exp. 1) reported that only judgments from participants with *moderate* attitudes toward doctor-assisted suicide were

influenced by ease-of-retrieval experiences; judgments from participants with more extreme attitudes were not. Again, this finding may be interpreted in terms of differences in malleability. Participants with moderate attitudes presumably formed their judgments online, whereas those with more extreme attitudes presumably recruited their previously formed attitudes. As a result, the judgments of participants with moderate as opposed to extreme attitudes were more malleable and open to the influence of cognitive feelings.

Target-related malleability

Apart from differences across judgments, malleability may also stem from differences across targets: judgments may be more evaluatively malleable for some targets than for others. In one of the earliest demonstrations of this principle, Isen and Shalke (1982) found that incidental mood states had greater mood-congruent influence on the ratings of slides that were affectively neutral than on the ratings of slides that were either affectively positive or negative. The authors reasoned that the stronger effect of mood states on neutral slides was due to the fact that neutral slides could be viewed as either positive or negative (i.e., were evaluatively ambiguous). Similarly, Gorn, Pham, and Sin (2001) observed that transient mood states influenced the evaluation of an ad if the ad was affectively ambiguous, but not if the ad had a clearly pleasant affective tone. Presumably this is because judgments about affectively ambiguous ads are more evaluatively malleable (for conceptually similar evidence, Miniard, Bhatla, & Sirdeshmukh, 1992).

In a different domain, Salovey and Birnbaum (1989, Exp. 3) reported more pronounced effects of manipulated mood on negative health events (e.g., contracting some sort of cancer) than on positive health events (e.g., being in great physical shape). This is presumably because people are less familiar with negative health events than with positive health events, making judgments of the former relatively more malleable. Relatedly, Forgas and Moylan (1991) observed that incidental affective states had stronger influence on evaluations of a partner of another race than on evaluations of a partner of the same race. This is presumably because compared to same-race individuals, other-race individuals are more atypical and less familiar, making their evaluation more malleable. Subsequent studies

conceptually replicated these findings, further substantiating the notion that target atypicality increases the impact of affective feelings on judgment (Forgas, 1992a, 1992b, 1993, 1995b).⁴

While the malleability of the target in the above findings came mainly from its evaluative ambiguity, ambiguity may also arise as a function of the amount of information provided about the target. For instance, Bakamitsos (2006, Exp. 1) observed that incidental mood states have stronger mood-congruent influences on product evaluations when no information about the product's attributes is provided than when clear information is provided. Presumably this is because the absence of attribute information produces ambiguity and therefore evaluative malleability, allowing for a more pronounced impact of feelings in judgments. Similarly, Fedorikhin and Cole (2004, Exp. 2) observed that incidental mood states exerted more influence on product choices when no additional information was provided than when consensus information from prior evaluations was provided. Again, this moderation can be attributed to differences in ambiguity, with the target products being more ambiguous and hence evaluatively more malleable when no consensus information is given. Consistent with this ambiguity interpretation, the authors further reported that mood states influenced consumer choices more when two conflicting pieces of product information were presented without any indication about their relative importance (Fedorikhin & Cole, 2004, Exp. 3). When participants were told which of the two pieces of conflicting information to focus on, thus reducing ambiguity, the influence of feelings on choice was less pronounced. Also pertaining to target-related malleability, though operationalized via a dispositional variable, Srull (1987, Exp. 3) reported that evaluations formed by novices as compared to experts were more influenced by transient mood states. Presumably this is because experts are more knowledgeable in the respective domain, which reduces the evaluative ambiguity of targets and renders judgments less malleable to extraneous influences such as incidental affective feelings.

Finally, target-related malleability is also a function of whether the target has been evaluated previously. A judgment is more likely to be open to extraneous influences when no

prior evaluation of the same target has been formed. For instance, Srull (1987, Exp. 2) presented participants an ad for a car with various pieces of attribute information. Participants were asked to either form an evaluation online or simply absorb the presented information. Twenty-four hours later, participants were induced into a positive or negative mood and asked to form an evaluation of the car again, this time without the ad. It was found that mood influenced evaluations only for participants who were previously asked to absorb the information. For participants who were initially told to evaluate the car, no reliable influence of mood on judgments was detected. Apparently, prior evaluations made judgments about the car less malleable and less open to the influence of incidental affective feelings (for conceptually similar results, see Fedorikhin & Cole, 2004, Exp. 1; Yeung & Wyer, 2004; 2005, Exp. 2).

Conclusion

A substantial set of findings indicate that another important moderator of the influence of feelings on judgment is the evaluative malleability of the judgment: feelings exert stronger influences when judgments are evaluatively malleable. The fact that similar effects have been observed with many different forms of malleability—resulting from variation across judgments and targets—strongly supports this principle. To date, the evidence supporting this principle is more extensive in the domain of affective feelings than in the domain of cognitive feelings.

We recognize that some of the findings reviewed here could potentially be subsumed under one of the preceding three moderator categories. For instance, the finding that transient mood states had stronger influence on the evaluation of an ad if the ad was affectively ambiguous than if the ad had a clearly pleasant affective tone (Gorn et al., 2001) were interpreted here as consistent with the principle of evaluative malleability. However, one could alternatively argue that participants' mood states were relatively more salient when the ad was affectively neutral than when the ad itself was clearly pleasant. This finding could thus also be seen as a manifestation of the salience principle. Similarly, consider the finding that the impact of mood states is more pronounced for judgments of general life satisfaction

than for judgments about specific life domains (Schwarz et al., 1987). Although we interpret this finding as consistent with the principle of evaluative malleability, one may alternatively see it as supporting the principle of relevance: transient mood states may be perceived to be more relevant when judging one's general life satisfaction than when judging one's satisfaction with specific life domains. Unfortunately, the evidence available to date does not allow a definite disentangling of these alternative interpretations. In such cases, we therefore elected to use the categorization that best matched the explanation originally provided by the authors. Nevertheless, even if some of the findings reported in this section may be better categorized under a different section, we believe that evaluative malleability should be seen as a conceptually distinct moderator, because evaluative malleability may vary even if salience, representativeness, and relevance are held constant (see also Fiedler, 1991).

Processing intensity

A fifth and final category of findings indicates that the reliance on affective and cognitive feelings in judgment is moderated by the individual's processing intensity. While there is ample evidence that the processing intensity that characterizes a judgment often alters the degree to which people rely on their feelings, authors differ in terms of how to interpret such findings. Some have suggested that the moderating effects of processing intensity can be best understood in terms of one (or more) of the principles already identified in this review—salience, representativeness, relevance, and malleability. For example, it has been proposed that processing intensity influences whether an incidental affective or cognitive feeling is salient, perceived to be representative (e.g., Albarracín & Kumkale, 2003), or perceived to be relevant (Greifeneder & Bless, 2007). Other authors have suggested that processing intensity exerts a *direct* effect on the reliance on feelings, independently of these other principles. For example, it has been suggested that lower processing intensity inherently encourages the reliance on feelings by precluding the systematic integration of message-induced beliefs (e.g., Albarracín & Wyer, 2001). Because in many cases the absence of adequate process data does not allow for a clear disentangling between these contrasting views, we elected to review all findings pertaining to

the moderating effects of processing intensity under a separate moderator category. While we recognize that some of these findings may also reflect the operation of other moderators identified previously, we will emphasize the unique contribution that processing intensity may have over and above the other moderators, as general processing background. Processing intensity is therefore treated as a separate functional category (as opposed to an operationalization of one of the other four moderator categories).

The findings reviewed in what follows can be organized into two conceptually related sub-groups: motivation and opportunity. Again, the results are discussed jointly for affective and cognitive feelings. A concise overview is provided in Table 5.

Processing motivation

A number of studies indicate that the reliance on affective feelings as information in judgment is stronger when the person's processing motivation is low. For instance, in one study (Batra & Stayman, 1990), participants in a positive or neutral mood state were shown an ad for a bank, and asked to report their attitude toward the bank. Results revealed a strong effect of mood on attitudes among participants low in need for cognition, but not among participants high in need for cognition, as assessed by the Need for Cognition Scale (Cacioppo, Petty, & Kao, 1984). Similarly, Petty, Schumann, Richman, and Strathman (1993, Exp. 1) reported a direct effect of feelings as information on judgments only for participants low in need for cognition. Among participants high in need for cognition, the effects of incidental feelings were mediated by participants' thoughts, consistent with a priming-account.

In an extension of these quasi-experimental findings, Petty and colleagues (1993, Exp. 2) manipulated processing motivation experimentally by varying personal relevance. Participants were shown several commercials and subsequently asked to evaluate one of the advertised products: a pen. To create different levels of processing motivation, participants in the high personal relevance condition were told that at the end of the session, as a gift, they would get to choose a pen that was available in their region; in contrast, participants in the low personal relevance condition were told that the gift was instant coffee that was not

available in their region. Results again indicate that feelings were used as information in forming attitudes under conditions of low processing motivation (for conceptually similar results, see Bosmans & Baumgartner, 2005, Exp. 2; Isbell & Wyer, 1999).

Extending these findings, Albarracín and Kumkale (2003) reported mood effects on judgments only for conditions of *moderate* processing intensity, that is, when either intrinsic motivation or processing opportunity were low. When both were low or both were high, no mood effects on judgments were observed. The authors explain this curvilinear relationship between processing intensity and reliance on feelings by differentiating the influence of motivation on two separate underlying processes. First, to be used as information, feelings need to be identified. According to Albarracín and Kumkale, this identification is more likely under higher processing intensity (consistent with the principle of salience). Second, once identified, feelings also have to be perceived as representative to be used as information in judgment. When the real source of the feelings is incidental, higher levels of processing intensity increase the chance that the feelings will be seen as not representative, and therefore will not be used in the judgment (consistent with the principle of representativeness). These separate effects of processing intensity on feeling identification and assessment of representativeness combine into the observed curvilinear relationship between processing intensity and reliance on incidental affective feelings in judgment. Note, however, that once the likelihood of identification of the feelings is controlled for, the net effect of processing intensity on the perceived representativeness of incidental feelings—and the reliance on these feelings—is negative, which is consistent with the theorizing and findings reviewed above (e.g., Isbell & Wyer, 1999). A possible reason why earlier studies only found a negative effect of processing intensity on the reliance on feelings, whereas Albarracín and Kumkale (2003) found a curvilinear effect, is that levels of processing intensity considered low in these earlier studies were nevertheless sufficient for feelings to be identified. Taken together, these findings converge in suggesting that, everything else being equal, affective feelings are more likely to be used as information in judgment formation when processing motivation is low.

Whereas the pattern of results regarding the moderating effects of processing motivation on the reliance on affective feelings is consistent, the evidence with respect to *cognitive* feelings is rather mixed. Consistent with the findings typically observed for affective feelings, one line of research suggests that feelings of ease-of-retrieval are more likely to influence judgments under conditions of low processing motivation. In this line of research, it is generally assumed that feelings of ease or difficulty are perceived to be indicative of the *quantity* of the retrieved content (see Tversky & Kahneman, 1973). Given that heuristic cues such as the quantity of content information are more important under conditions of heuristic processing (e.g., Chen & Chaiken, 1999), the influence of feelings should be strongest when processing motivation is low. Results consistent with this reasoning have been obtained with different methodological operationalizations. For instance, Rothman and Schwarz (1998) varied personal relevance by assessing individuals' family history of heart disease and by framing the retrieval task as either about the self or about the average person. The authors predicted that both a family history of heart disease and a focus on the self would increase processing motivation and therefore decrease the reliance on cognitive feelings. In line with this prediction, feelings of ease-of-retrieval influenced perceptions of vulnerability to heart disease when processing motivation was low, but not when it was high (for conceptually similar evidence, see Grayson & Schwarz, 1999).

Haddock (2002) manipulated the ease-of-retrieval of reasons to like or dislike Tony Blair before assessing participants' attitudes toward him. Processing motivation was operationalized by classifying participants based on their personal interest in British politics. Again, ease-of-retrieval effects were stronger among participants with low processing motivation than among those with high processing motivation. Relatedly, Florack and Zoabi (2003) measured need for cognition and found that only participants low in need for cognition relied on their feelings as information. Finally, Broemer (2004, Exp. 3) manipulated personal relevance experimentally by asking participants to think about either trivial (low relevance) or serious disease symptoms (high relevance). Again, cognitive feelings of ease or difficulty

influenced judgments only when personal relevance was low (see also Greifeneder, 2007, Exp. 2).

The above evidence mainly capitalized on different levels of personal relevance. Another way to influence processing motivation is to vary the motivation for accuracy. Aarts and Dijksterhuis (1999, Exp. 2) asked bicycle owners to list few versus many destinations that they used their bicycles to travel to. Participants were then asked to estimate their frequency of bicycle use. To vary accuracy motivations, participants were asked to provide either an exact estimate or a rough estimate. As predicted, only the participants with low accuracy motivation were influenced by their ease-of-retrieval feelings in their frequency estimates (for similar evidence, see Greifeneder, 2007, Exp. 1).

Finally, a more indirect way of influencing processing motivation is through uncertainty. Given that individuals are generally motivated to reduce uncertainty (e.g., Van den Bos & Lind, 2002), one can hypothesize that conditions of uncertainty should increase individuals' processing motivation, and therefore decrease individuals' reliance on feelings in judgment. Consistent with this theorizing, a series of studies revealed that feelings of ease-of-retrieval influenced judgments and behaviors under conditions of certainty, but not under conditions of uncertainty (Greifeneder, Müller, Stahlberg, Van den Bos, & Bless, 2009a, 2009b; Müller, Greifeneder, Stahlberg, Van den Bos, & Bless, 2010).

In contrast, a second line of work suggests that ease-of-retrieval experiences are more likely to influence judgments under conditions of *high* processing motivation. In this line of work, it is generally assumed that feelings of ease or difficulty are perceived to be indicative of the quality of or the confidence in the retrieved content; that is, the feelings serve as information that qualifies the retrieved content information. Note that in this line of work, the influence of feelings of ease or difficulty is not due to thought-priming, but to feelings serving as information about thought content. Given that the quality of content information is generally believed to be important under conditions of systematic processing (e.g., Chen & Chaiken, 1999), this influence of feelings should be stronger when processing motivation is high. Consistent with this reasoning, Wänke and Bless (2000) observed that

experiences of ease-of-retrieval of positive aspects led to more positive evaluations under conditions of high motivation than under conditions of low motivation, operationalized via need for cognition or by instructing participants to report accurate (high motivation) versus spontaneous reactions (low motivation). Tormala and colleagues (2002) also examined how processing motivation moderates the influence of ease-of-retrieval experiences in the context of attitudes toward a new exam policy. In one study, processing motivation was operationalized by assessing participants' need for cognition. In another study, it was manipulated by varying the personal relevance of the target and participants' accountability for their judgments. In both studies, ease-of-retrieval experiences influenced the evaluation of the exam policy in conditions of high but not low processing motivation. Relatedly, Hirt, Kardes, and Markman (2004) observed more reliance on cognitive feelings as information among participants with high need for structure (measured via the Need for Structure Scale; Webster & Kruglanski, 1994) than among those with low need for structure.

In summary, conditions of both low and high processing motivation have been found to amplify or reduce the impact of ease-of-retrieval experiences on judgments. To date, this inconsistency in findings has not been resolved. However, we speculate that the key to reconciling the two conflicting sets of results resides in participants' spontaneous inferences about what an easy or difficult recall of information means. Indeed, what differentiates the two process perspectives is whether participants use their feelings as an indication of the quantity of, or an indication of the confidence in, the recalled content information (see also Greifeneder & Bless, 2007). We suspect that some aspects of the judgment task may encourage one type of inference over the other. For example, if the judgment is about estimating the frequency of one's bicycle use (Aarts & Dijksterhuis, 1999), feelings of ease or difficulty are more likely to be interpreted as indicative of the frequency of instances than as indicative of confidence in these instances. Conversely, if the judgment is about a new exam policy after retrieving supporting arguments (Tormala et al., 2002), feelings of ease or difficulty may be more likely to be interpreted as indicative of the confidence in these arguments than their frequency. We leave it to future research to corroborate these

speculations. Interestingly, these differences in interpretation may also explain why processing motivation is the only variable for which a differential pattern of moderating evidence for affective versus cognitive feelings was observed. As mentioned previously, interpretations of cognitive feelings may be less determined and more flexible than interpretations of affective feelings. Consequently, cognitive feelings may be interpreted in ways that matter in different processing contexts, whereas affective feelings seem to matter primarily in one processing context, low processing motivation. Once cognitive feelings are also interpreted in a way that matters when processing motivation is low, however, the pattern of findings for affective and cognitive feelings is parallel.

Processing opportunity

The evidence accrued for processing opportunity uniformly holds that affective and cognitive feelings are more likely to influence judgments when processing opportunity is low. For instance, Siemer and Reisenzein (1998) asked participants induced into a happy or sad mood state to respond to a large number of satisfaction items. The authors operationalized different levels of processing opportunity through four combinations of time pressure and task competition. One quarter of the items were presented with neither time pressure nor competing task; one quarter with no time pressure and a competing task (remembering a 5-digit number); one quarter with time pressure and no competing task; and the final quarter with both time pressure and competing task demands. The results exhibited a clear linear trend showing that the impact of mood states on satisfaction judgments decreased with higher levels of processing opportunity. The strongest impact of affective feelings on judgments was observed when there was both time pressure and competing task demands (lowest processing opportunity); the smallest impact was observed when there was neither time pressure nor competing task (highest processing opportunity).

Similar findings have been observed with affective feelings that are integral to the object of judgment. For example, Shiv and Fedorikhin (1999) manipulated integral affective responses by offering participants a choice between a chocolate cake eliciting strong positive affective reactions, and a fruit salad eliciting weaker positive affective reactions. They

manipulated processing opportunity by varying participants' cognitive loads. Results revealed a stronger preference for the cake under conditions of high cognitive load (low processing opportunity) than under conditions of low cognitive load (high processing opportunity), again suggesting that the impact of affective feelings is stronger when processing opportunity is low (see also Shiv & Fedorikhin, 2002; for related evidence, see Pham, Cohen, Pracejus, & Hughes, 2001, Exp. 3).

Taking a different methodological approach, Rottenstreich, Sood, and Brenner (2007) manipulated processing opportunity by either asking participants to indicate their preference with respect to options they had previously seen (memory-based choice), or by showing participants the options presented previously and then asking them to choose (stimulus-based choice). Because recalling options from memory and retaining them in working memory is presumably more taxing than reading about the options, a memory-based choice should involve lower processing opportunity than a stimulus-based choice. Consistent with this reasoning, integral affective feelings exerted a stronger impact in the memory-based condition than in the stimulus-based condition, presumably as a result of a different processing opportunity across conditions.

Albarracín and Wyer (2001) induced participants into a positive or negative mood state and manipulated participants' processing opportunity by means of a background noise, which was either not distracting (high processing opportunity) or distracting (low processing opportunity). Participants were then presented with a persuasive message and asked to report their attitudes after reading the message. Paralleling other findings, analyses revealed that affective feelings were more likely to be used as information under conditions of low processing opportunity (see also Albarracín & Kumkale, 2003). According to the authors, this is because low-opportunity participants relied on their subjective affective feelings toward the target as they were unable to integrate their message-induced beliefs into a summary attitude. In contrast, under conditions of high processing opportunity, judgments were influenced by argument strength and were unrelated to affective feelings.

Conceptually similar results have been reported in the realm of cognitive feelings by Greifeneder and Bless (2007), who observed that experiences of ease or difficulty have stronger influences on judgments under conditions of low processing opportunity than under conditions of high processing opportunity. In addition to measuring the effects of ease-of-retrieval on judgments, Greifeneder and Bless also assessed the processing latencies associated with the judgments to shed more light on the underlying processes. Assuming that cognitive feelings are single pieces of information (Koriat & Levy-Sadot, 1999), one would expect that it would take similar amounts of time to form a judgment based on feelings of ease or on feelings of difficulty. However, judgments based on the content of recalled information should take longer when more pieces of information need to be integrated. The authors therefore predicted that judgments under conditions of low opportunity would exhibit similar latencies regardless of the number of items that had to be retrieved, whereas judgments under conditions of high opportunity would exhibit longer latencies when more items had to be retrieved. Results were in line with this prediction, supporting the claim that individuals are likely to rely on their feelings of ease-of-retrieval as information under conditions of low opportunity (for a conceptually related finding, see Ruder & Bless, 2003).

Conclusion

A large number of studies, across a variety of methods and a variety of judgment domains, indicate that both the use of affective feelings and the use of cognitive feelings in judgment are moderated by processing intensity. The large majority of these findings indicate that the reliance on feelings is more likely when processing intensity, whether motivation-based or processing-opportunity-based, is low.

While processing intensity was discussed as a separate moderator category, it appears that it operates both as a primary moderator (parallel to the other four moderators), and as a secondary moderator, whose influence is mediated by one of the other moderators. While the available evidence on underlying processes is insufficient to decide which mechanisms were operating in which instance, this situation allows for one important conclusion: although this review treats the five moderator categories as parallel, it is possible

that the moderators operate at different levels. Future research may resolve this question by assessing not only the final judgments, but also process information pertaining to salience, representativeness, relevance, and malleability.

General conclusions on moderators of the reliance on feelings

The main objective of this paper was to provide an integrative review of factors that moderate the reliance on both affective and cognitive feelings in judgment. Five major categories of moderators were identified, with subcategories of conceptually similar findings within each main category. Five major conclusions can be drawn from the reviewed evidence. First, feelings exert a stronger influence on judgments when exceeding a certain threshold of salience. Second, feelings exert a stronger influence on judgments when perceived as representative of the target. Third, feelings exert a stronger influence on judgments when perceived as relevant for the judgment. Fourth, feelings exert a stronger influence on judgments when these judgments are evaluatively malleable. And finally, feelings generally exert a stronger influence on judgments under conditions of low processing intensity.

It was additionally found that both the structure of the moderators and the observed patterns of results were remarkably similar for affective and cognitive feelings, suggesting that the determinants of reliance on affective versus cognitive feeling are largely parallel. From this parallelism, one may infer that the processes underlying the influence of affective versus cognitive feelings are probably closely related, if not common. However, caution is needed before accepting this conclusion, as it is based only on a “paramorphic” similarity of outcome contingencies, rather than on direct evidence of isomorphic equivalence. This conclusion should thus be seen as only tentative. Still, given the high degree of similarity of contingencies between affective and cognitive subjective feelings, it seems likely that the two types of feelings operate through the same set of mechanisms. This proposition would be consistent with a series of theoretical accounts that strongly argue for the unity of affective and cognitive feelings (e.g., Bless & Forgas, 2000; Clore, 1992; Koriat & Levy-Sadot, 1999; Schwarz & Clore, 2007; Strack, 1992). Intriguingly, the high level of similarity between

affective and cognitive feelings raises the possibility that there may be a single system of feeling-based judgment, which may also handle bodily feelings. This feeling-based system would be characterized by the operation of the five sets of moderators reviewed in this contribution, which collectively determine when feelings are used as information.

It should be noted, however, that this review focused on evidence pertaining to one type of affective feeling—subtle incidental or integral affective experiences—and one type of cognitive feeling—subtle experiences of ease-of-retrieval. This focus reflects the fact that the literature on moderators of the reliance on feelings has largely focused on these two particular kinds of feelings, for various theoretical and methodological reasons. Yet, in line with theorizing suggesting that different feelings share important characteristics that make them operate in a similar fashion (e.g., Clore, 1992; Schwarz & Clore, 2007), we suspect that the primary conclusions of this review can be extended to other kinds of affective and cognitive feelings that share the same structural characteristics. Should other affective or cognitive feelings be structurally different from the ones reviewed here, their moderators could be different. However, one could alternatively hypothesize that even if other feelings are quite different from those reviewed here, the fundamental principles that govern their operations may remain the same. Take, for instance, the case of emotions, which unlike subtle mood states, have clear referents or causes (e.g., Ortony, Clore, & Collins, 1988). If emotions are found not to influence unrelated target judgments, it may be precisely because emotions, with their clear referents, are more likely to be perceived as unrepresentative of unrelated targets. Therefore, the degree to which different moderating factors identified in this review apply to different affective and cognitive feelings could simply be a function of the degree to which these other feelings share the characteristics of the feelings addressed in this review. The fact that subtle affective feelings and feelings of ease-of-retrieval may be particularly prone to being used as information, may thus have enabled us to identify the broader parameters of the general reliance on feelings in judgment.

Theoretical conjectures on the ecology of feelings-as-information

Given that the empirical evidence reviewed here leaves little doubt that feelings *can* be used as information in judgments, it is important to examine the implications of this phenomenon beyond the confines of laboratory settings. To address this issue, we first speculate on whether the reliance on feelings in everyday life is likely to be ubiquitous or rather uncommon. We then speculate on why individuals often appear unaware of the frequency with which they rely on their feelings in judgment. We end with conjectures on why the reliance on feelings in judgment may be generally valid rather than error-prone.

Feelings are frequently used as information

As a starting point, it seems reasonable to assume that feelings are always accessible (though not necessarily always salient). This assumption stems from the notion that affective and cognitive feelings are activated automatically and are constant by-products of human functioning. For instance, Whittlesea and Leboe (2000) argued that information processing is constantly monitored and reflected in fluency. Similarly, many authors have argued that affective feelings are often instantiated immediately upon exposure to a target (e.g., Pham et al., 2001; Zajonc, 1980).

Assuming that feelings are always accessible, the next question pertains to when they will be used as information. The evidence reviewed in this article suggests that feelings are more likely to be used as information when processing intensity is low. Given that processing intensity is generally low in daily life (Eagly & Chaiken, 1993; Krugman, 1965), feelings may be expected to influence judgments frequently. In fact, feelings may influence judgments relatively more frequently than the systematic integration of content information does. Consider activities such as doing groceries, commuting to work, deciding about lunch, or watching TV: like most activities of daily life, these are generally characterized by a lack of processing intensity, which should foster the reliance on feelings as a basis for judgment. But even if processing motivation and capacity are relatively high, they may still be insufficient when judgments are very complex, such as when the number of decision alternatives is very

large, thereby encouraging the reliance on feelings as a way of dealing with this complexity. Other research and theoretical analyses support the conclusion that affective and cognitive feelings are relied upon frequently in daily life. First, the sheer variety of judgments that have been shown to be influenced by feelings suggests that feelings must exert pervasive influences on judgments (e.g., Pham, 2008; Schwarz, 2004; Schwarz & Clore, 2007). Moreover, it has been shown that the conscious monitoring of affective feelings provides particularly fast assessments that are likely to be primary—and therefore more frequently used—in judgment (Pham et al., 2001; see also Verplanken, Hofstee, & Janssen, 1998).

From the accumulated evidence, it seems reasonable to conclude that feelings exert ubiquitous informational influences on judgments in daily life—influences that are more pervasive than is generally assumed. The pervasiveness of these influences renders the notion of a computational person—who relies solely on content information and ignores feelings—anachronistic. This suggests that conceptions of individual decision making both within and outside psychological research should be updated. Moreover, the present conclusion challenges the theoretical view that the direct use of feelings in judgment—as compared to the influence of feelings on judgment via thought or content priming—is a phenomenon confined to “limited circumstances” (Forgas, 1995b, p. 762; see also Fishbein & Middlestadt, 1995). The synthesis of empirical evidence offered here demonstrates that the direct use of feelings as information in judgment is a very—and possibly even the more—common phenomenon.

Why people are often unaware of the influence of feelings

If one accepts that feelings frequently influence judgments, why are individuals often unaware of this influence? Put differently, why might the above conclusion be surprising to many individuals, especially in western societies, which generally value rational thought? One reason may be that individuals are often unaware of the processes that underlie the reliance on feelings in judgment (e.g., Menon & Raghurir, 2003).

A second reason may be that the judgment implications of content information and the judgment implications of feelings are often aligned, depriving individuals of diagnostic

feedback. Consider one of the original studies on the ease-of-retrieval phenomenon (Tversky & Kahneman, 1973, Exp. 3). Participants were asked to estimate the relative frequency of English words beginning with the letter “r” as compared to the frequency of words having the letter “r” in the third position. Participants generally judged words beginning with the letter “r” to be more frequent, presumably because it felt easier to retrieve words from this category. Intriguingly, however, if participants actually tried to find instances of the respective word categories, they would likely come up with more words beginning with the letter “r” than words having the letter “r” in the third position. In this case, then, implications drawn from feelings and implications drawn from content information would be aligned, and judgments would not be diagnostic about the inputs they are based on. As this is presumably a common situation outside laboratory settings, people may often have the impression that they are relying on content even when, in fact, they are relying on feelings (see also Pham et al., 2001, Exp. 3).

A third potential reason is that individuals generally have very little insight into the inner workings of their minds, and often rely on lay theories to explain the outcome of their thinking (Nisbett & Wilson, 1977). Given the high regard that rational thought enjoys in western societies, it is likely that these lay theories would generally focus on content information and understate the influence of feelings. In light of these three potential explanations, it is not particularly surprising that individuals would underestimate the pervasive influence of feelings on their judgments.

Interestingly, if individuals are often unaware that feelings influence judgment, one may entertain the speculation that the feelings themselves are possibly unconscious (e.g., Winkielman, Berridge, & Wilbarger, 2005). While intriguing, this issue is largely a matter of debate about what a feeling is, and whether there can be affect without feeling (e.g., Clore, Storbeck, Robinson, & Centerbar, 2005). From the present perspective, a decisive characteristic of affective and cognitive feelings is that they can be experienced, which seems to imply at least some level of consciousness. This does not preclude the possibility, however, that some of the antecedents giving rise to feelings are unconscious. On the

contrary, feelings may be valid sources of information because they are evoked by both conscious and unconscious antecedents, as discussed in what follows.

The validity of judgments based on feelings

The ubiquity of the reliance on feelings in judgment does not, per se, make this reliance beneficial. For the reliance on feelings to be a sensible form of judgment, it needs to promote judgment validity. Indeed, if feelings were as harmful to sound judgment as is sometimes claimed (see Elster, 1999), one would wonder why such a mechanism would have evolved and persisted over time. Contrary to such pessimistic views about the reliance on feelings in judgment, several theoretical rationales and empirical findings suggest that the reliance on feelings is generally helpful for sound judgment, and that there may be “wisdom in feelings” (Schwarz, 2002a; see also Pham, 2007; Schwarz & Clore, 2007; Stephen & Pham, 2008).

A first rationale can be derived from the conceptualization of feelings as meta-summaries, which deserves some elaboration here. Consider first *affective feelings*, which have been suggested to code the valence of a wide variety of external and endogenous events (e.g., Morris, 1989), such as weather conditions (Schwarz & Clore, 1983), finding a dime (Isen & Levin, 1972), thinking about life events (Strack et al., 1985), or reflecting on personal fears (Velten, 1968). Although these events may be consciously accessible, they do not necessarily need to be, because feelings generally “can be formed unconsciously without (or before) a full articulation of the specific informational content on which they are based” (Koriat & Levy-Sadot, 1999, p. 485). Moreover, different events may be coded together into one feeling (Clore & Parrott, 1994), allowing feelings to summarize a large amount of information. Therefore, in reflecting a variety of events that may have occurred both above and below the threshold of consciousness, affective feelings constitute powerful summaries that can be seen as “an *integrative expression* of the general state of the organism” (Schwarz et al., 1987, p. 70, italics added). The same is true for *cognitive feelings*, which reflect both characteristics of the activated content information, as in feelings of familiarity (e.g., Koriat, 1993), and characteristics of its cognitive processing, as in feelings of ease-of-

retrieval (e.g., Tversky & Kahneman, 1973). Although both content and processes may be consciously accessible, they do not have to be, as is apparent for instance in the “tip-of-the-tongue” phenomenon (Schwartz, 2002), which emerges despite the fact that the target information is not consciously accessible. Therefore, similar to their affective counterparts, cognitive feelings can be conceptualized as meta-summaries of events and processes that are activated or operate above and below the threshold of consciousness (e.g., Koriat & Levy-Sadot, 1999).

This notion of feelings as meta-summaries allows for several propositions about their validity. First, because meta-summaries code many pieces of information simultaneously, feelings should be relatively efficient compared to single pieces of content information that need to be integrated. Second, by granting a simultaneous window onto the conscious and the unconscious (e.g., Koriat & Levy-Sadot, 1999), feelings can convey *more* information than is typically coded in consciously accessible content. For instance, it has been suggested that internal feelings may signal that “something” is wrong about the current situation, even if this “something” cannot be specified (Bless et al., 1996). To the extent that the weighing of a greater amount of independent information should generally increase judgment validity, one could argue that feelings should provide information that is at least as valid as, if not more valid than, content information. Moreover, because feelings presumably code the world around us continuously, they should enable a more ecological mapping onto essential characteristics of the surrounding world compared to content inputs, which are probably assessed more sporadically (see Pham, Lee, & Stephen, 2010; Stephen & Pham, 2008).

This is not to deny that there is also ample evidence of misleading influences of feelings on judgment, especially in the context of scientific experimentation. One should keep in mind, however, that most of these experiments—such as those on the effects of incidental mood states—were *intentionally designed* to document influences of feelings that were seemingly illogical in order to demonstrate that feelings were used in the first place (see also Bless, 2002). Some experiments are even explicitly constructed so that a feeling-based decision will be inferior on some normative criterion (e.g., Shiv, Loewenstein, Bechara,

Damasio, & Damasio, 2005). Although it would appear that the reliance on feelings impairs decision making in such experiments, these experiments are not diagnostic of the true ecological validity of feelings outside experimental settings, because the relationship between feelings and the criterion is arbitrarily determined (e.g., Pham, 2007).

More problematic are findings in which feelings were shown to result in poor judgments even though the occurrence of feelings and their mapping onto normative criteria was not experimentally manipulated. One classic example is the effect of weather-induced mood states on judgments and decisions (Schwarz & Clore, 1983). In this case, feelings distorted judgments because participants failed to recognize that weather-induced feelings are incidental and therefore not representative of the target to be evaluated. This example illustrates the importance of the representativeness principle and points to the Achilles' heel of the reliance on feelings in judgment. Specifically, because representativeness is primarily guided by temporal contiguity (e.g., Clore, Wyer et al., 2001), it may lead astray when joint occurrence is not indicative of causality.

Fortunately, however, contiguity is not the sole criterion of representativeness, which is likely to be more accurately assessed when other diagnostic cues are available. For instance, Oppenheimer (2004) noted that feelings of ease-of-retrieval are generally a good proxy (i.e., informative or representative) for estimating the frequency of names in a population, as familiar names are likely to be more prevalent. Critically, however, for celebrity names such as the name "Bush," frequency estimates were not influenced by participants' cognitive feelings, presumably because participants spontaneously suspected a bias through media coverage and therefore perceived their feelings to be unrepresentative. Hence, although the contiguity principle renders the representativeness assessment fallible, the consideration of other cues likely lowers the risk of errors. In addition, one should keep in mind that the representativeness principle is complemented by other moderators, such as relevance, which further promote judgment validity. From this one may conclude that the processes underlying the reliance on feelings generally guard against inappropriate

influences, making this reliance a generally sensible strategy (see also Oppenheimer, 2004; Schwarz, 2004; Schwarz & Clore, 2007).

In summary, there is good reason to believe that relying on one's feelings is not a definite source of error, but rather a generally sensible mechanism. First, as meta-summaries of a multitude of consciously or unconsciously accessible events and processes, feelings are particularly efficient carriers of information that are likely to be valid more often than not. Second, in the event that feelings are inappropriate sources of information, the two metacognitive assessments of representativeness and relevance are likely to guard against their use in judgment, at least more often than not. These conclusions are further supported by theorizing across the domains of affective and cognitive feelings (e.g., Bless, Keller, & Igou, 2009; Greifeneder, 2007; Pham, 2007, 2008; Schwarz & Clore, 2007), and by recent empirical findings from studies where the criterion "validity of feelings" was ecologically determined and not under the experimenter's control (e.g., Pham et al., 2010; Stephen & Pham, 2008). Although this is speculation, we argue that it is precisely because of their high degree of validity that feelings have evolved to be a frequent source of influence.

Conclusion

The evidence reviewed here, along with related theorizing and findings, suggests that the reliance on affective and cognitive feelings as information in judgment is likely to be a frequent occurrence in daily life. We speculate that individuals are often unaware of their frequent reliance on feelings, that this reliance on feelings often has similar judgmental implications as the reliance on content information, and that it is typically not part of people's overt theories of thinking. We also suggest that reliance on feelings is not, as often assumed, a necessarily flawed heuristic, but a generally sensible judgment strategy.

Quo vadis: Future research on feelings and beyond

This final section identifies four promising lines of research that emerge from this integrative review. The first pertains to the interplay among the various moderators of

reliance on feelings identified in this review, and a possible general process model of reliance on feelings that this interplay implies. The second sheds light on the interplay between feeling-based and content-based inputs and processes. The third discusses potential implications of our findings for dual-process models of judgment, as well as for research on intuition and unconscious thought. Finally, we speculate on how individuals may be trained in feeling-based judgment so as to further increase judgment validity.

Toward a general process model of reliance on feelings in judgment

While this review identified five moderator categories in descriptive fashion, it has remained largely silent about the sequence in which these moderators operate. This is because most previous empirical investigations addressed only one moderator and are thus uninformative about any temporal order among moderators. One important avenue for future research, therefore, is to clarify the temporal sequence in which the moderators operate, as well as their potential interrelations. A programmatic investigation of these issues would help to advance a comprehensive process model of the reliance of feelings in judgment—a model that is clearly missing from the literature.

An initial step in this direction is Albarracín and Kumkale's (2003) model, which posits that the reliance on incidental affective feelings in judgment involves two sequential stages. The first stage is identification of feelings, which is sensitive to salience. The second stage is discounting, in the course of which feelings that are perceived to be unrepresentative of the target are excluded from its evaluation. While this model seems appropriate and sufficient to describe the interplay between salience and representativeness, it does not easily accommodate the moderating roles exerted by other moderators such as relevance and malleability. For example, while it seems logical that feelings must first be noticed before they can be assessed for representativeness (i.e., salience precedes representativeness), it is not obvious that the identification of feelings necessarily precedes their assessment for relevance. Indeed, it may well be that high or low perceived relevance of feelings—for example, being asked “Do you like this movie?” versus “What time is the next show?”—increases or decreases the salience of these feelings (relevance precedes salience). At other

times, however, the relevance assessment may follow or even be prompted by the salience of feelings. For instance, people who notice that they have unusually strong feelings about another person may start wondering whether these feelings are relevant when forming judgments about this person. This suggests that a comprehensive process model of reliance on feelings in judgment should accommodate the possibility of both (a) early selection of and attention to feelings as a basis for judgment, and (b) late inclusion or discounting of (previously) noticed feelings in judgment. Such a model should also clarify the stage (or stages) at which judgment malleability comes into play. It could be early in the process sequence—possibly as a determinant of whether feelings are attended to in the first place—or later in the process sequence—possibly during an interpretation of the judgment implications of the feelings or during judgment integration. To address these conjectures, and to advance a comprehensive process model, future research will need to simultaneously investigate several moderators in ways similar to Albarracín and Kumkale (2003). Methodological emphasis should be placed on discerning the temporal sequence of and the possible interrelations between different moderator categories.

Interdependence of feeling-based and content-based inputs and processes

A second avenue of future research may be to focus on the independence or interdependence of feeling-based and content-based inputs and processes. Given evidence that feelings are instantiated almost immediately upon exposure to targets (e.g., Zajonc, 1980), monitored continuously (e.g., Whittlesea & Leboe, 2003), and often primary in judgment (e.g., Pham et al., 2001; see also Greifeneder & Bless, 2007; Ruder & Bless, 2003), one wonders to what extent feelings and content information are truly independent as opposed to *interdependent* sources of information. Consider findings by Bless (1995), who asked individuals to recall events of their kindergarten time. Consistent with previous research (e.g., Bower, 1981), happy individuals recalled more positive (and less negative) events than sad individuals. However, this mood-congruent-recall effect was more pronounced if participants were first asked to form a global evaluation of their kindergarten time. This is presumably because individuals answered the global evaluation based on a

“How-do-I-feel-about-it?” heuristic, which then served as a retrieval cue for consciously accessible content in memory. Along with other conceptually related results (Pham et al., 2001; Yeung & Wyer, 2004), this finding suggests that initial feelings may bias subsequent content processing in a confirmatory way. As such, this finding questions the often implicit assumption that feelings and content information are independent sources of information. Consequently, future research may fruitfully explore the likely temporal interplay between feelings and content information in judgment—an issue that the moderators identified in this review may help to clarify. For instance, if feelings and content information are processed as independent inputs, the greater the relevance of feelings, the less people may rely on content information. However, if content information is in fact used to validate initial feeling reactions, the greater the relevance of feelings, the more people may process feeling-consistent information, as observed by Yeung and Wyer (2004). More generally, whereas previous research has mostly focused on experimental situations in which feelings were orthogonal or conflicting with content information, future research may fruitfully devote more attention to situations where the two types of inputs are positively correlated, so as to further understand their interdependence.

*Implications for dual-process models of judgment as well as for research on intuition
and unconscious thought*

Research on the reliance on feeling versus content information in judgment often builds on dual-process models that distinguish, for instance, between “heuristic versus systematic” processing (Chen & Chaiken, 1999), “experiential versus rational” processing (Epstein et al., 1996), “associative versus ruled-based” reasoning (Sloman, 1996), “impulsive versus reflective” processes (Strack & Deutsch, 2004), or “system 1 versus system 2” (Kahneman & Frederick, 2002). For all of these models, it is important to understand under which conditions one type of process is more likely to be engaged than the other. We speculate that the moderators of reliance on feelings identified in this review may be linked to the principles that channel the different modes of processing. For example, the “impulsive” determinants of behavior posited by Strack and Deutsch (2004) may be more operative

under high perceived representativeness or relevance. Thus, while this review focused explicitly on the reliance on feelings versus content in judgment, its findings may have much broader implications beyond the realms of feelings.

Our findings on the reliance on feelings versus content in judgment may also have important connections with research on the contrast between conscious and unconscious or intuitive modes of information processing. The latter research typically finds that intuitive or unconscious modes of thinking may sometimes be superior to explicit or conscious modes of thinking (e.g., Dijksterhuis, 2004; Wilson & Schooler, 1991). For instance, in an early study, Wilson and colleagues (1993) observed that individuals who were asked to explicitly articulate why they preferred certain alternatives over others before making a choice were more likely to subsequently regret their choices than individuals who were not asked to articulate their rationale beforehand. Relatedly, Dijksterhuis (2004) found that individuals who were prevented from consciously thinking about a set of alternatives they had to choose from—presumably enabling unconscious thought—were more likely to select normatively superior options compared to individuals who were allowed to think consciously.

Both of these conceptual frameworks are largely silent about one critical question: How do the unconscious or implicit processes become registered consciously, so that they can be articulated? We speculate that feelings may play a critical role in this process. Specifically, the success of unconscious thought or intuitive decision strategies may rest, at least in part, on individuals' reliance on feelings which code, as meta-summaries, a large variety of conscious and unconscious inputs. If our speculation is correct, the conditions in which unconscious or intuitive strategies guide decisions should neither be constant, nor vary arbitrarily. Rather, they should be a systematic function of the set of moderators identified in this review.

Training people in feeling-based judgment

Although we argue that the reliance on feelings is a generally sensible judgment strategy, we also recognize that feelings may sometimes lead us astray, particularly when incidental feelings are erroneously perceived to be representative of the target, and when

feelings are not or negatively correlated with normative criteria such as long-term self-interest or social welfare (see Pham, 2007). Accordingly, future research may fruitfully explore interventions to educate individuals about when (and when not) to rely on their feelings to make judgments and decisions.

Given that momentary feelings are generally assumed to be representative of the target, people may benefit from (a) greater awareness of the pervasive effects of incidental feelings on judgment, and (b) more refined conceptions of representativeness. Specifically, it would appear fruitful to make individuals aware that affective and cognitive feelings may be incidental—for instance, feelings from sunny (or rainy) weather, a friendly salesperson, an easy request for a small number of exemplars or the difficulty of reading a degraded text font—and that such incidental feelings may distort judgments. Moreover, judgment validity would likely be enhanced if individuals held more refined conceptions of representativeness that go beyond the principle of contiguity. To date, there is some evidence that in certain domains and situations people have refined conceptions of representativeness (Oppenheimer, 2004; Raghunathan et al., 2006). However, more research is needed to allow for a complete picture.

While more refined naïve theories of representativeness appear commendable, it should be kept in mind that increasing individuals' sensitivity to the "real" source of their feelings likely compromises a primary benefit of the reliance on feelings in judgment: the frugality of this process as a heuristic. An important question, therefore, concerns the level of abstraction at which lay theories of representativeness should be formulated? Another question is whether representativeness is represented propositionally or associatively. If it is represented propositionally, explicit information about objective principles of representativeness may be effective; however, if it is represented associatively, lay theories of representativeness would need to be developed through repeated associative learning.

Apart from representativeness, training in feeling-based judgment should focus on why feelings are more useful in certain environments than in others. For example, the advantage of relying on feelings seems to grow with the environment's richness and

complexity (e.g., Pham et al., 2010). Relatedly, feelings are logically bound to be more helpful in environments where there is a positive and strong correlation between their evaluative implications and the target's "true" criterion value. It will be interesting to investigate to what extent individuals are aware of such environmental contingencies, and how relevant naïve theories would need to be formulated so as to promote judgment validity. Should interventions prove successful in educating individuals about *when* to rely on their feelings, people would undoubtedly be even better served by their feelings.

General conclusion

Multidisciplinary evidence suggests that feelings may influence judgments of various kinds. However, just because a certain effect *can* occur does not mean that it is ecologically important. It is therefore critical to investigate the conditions under which this effect occurs (Zanna & Fazio, 1982). The goal of this review was to formalize the conditions under which feelings are more likely to be relied on in judgment. The review identified five major categories of moderators of this reliance: salience of the feeling, representativeness to the target, relevance to the judgment, malleability of the judgment, and processing intensity. Importantly, the category structure and the reported pattern of results were remarkably similar for affective and cognitive feelings, suggesting that affective and cognitive feelings operate in largely parallel fashion. In addition to granting insights about moderation, the reviewed evidence allowed for important theoretical conclusions about the ecology of feelings-as-information. It was concluded that the use of feelings as information is a frequent event, much more frequent than is often assumed. Moreover, this influence is not necessarily undesirable: the reliance on feeling may be a generally sensible judgment strategy. Therefore, it may be time to have more faith in the evidentiary status of feelings.

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Footnotes

- ¹ Many findings in the domain of affective feelings are, in and of themselves, not telling about the underlying process. In the typical paradigm used to investigate the influence of affective feelings on judgments, participants are induced to experience either a positive or negative incidental mood state (e.g., Schwarz & Clore, 1983, Exp. 1), or they are presented with a judgmental target that *itself* elicits positive versus negative (integral) feelings (e.g., Yeung & Wyer, 2005). Subsequently, participants are asked to form a judgment, such as indicating their general life satisfaction or evaluating a proposed brand extension. Typical results show more positive judgments when experiencing positive as compared to negative moods, or when evaluating targets eliciting positive as opposed to negative integral feelings. Findings such as these can be produced either by feelings being used as information (FI-account), or by feelings priming related thought content (priming-account). To be diagnostic of the underlying process, such studies need to either include process measures that are consistent with the assumptions of one or the other account (e.g., mood-congruent thought listings), or document boundary conditions that would be predicted by one or the other account (e.g., attribution to a target irrelevant source). Without such additional evidence, strong conclusions favoring one or the other process account are precluded. In this respect, Forgas (1992b, p. 869) notes that “neither memory nor impression-formation data constitute direct evidence about processing differences” (see also Schwarz, 2002b; Schwarz & Clore, 2007), and argues for the analysis of processing latencies. Given these considerations, the following inclusion criterion was applied: Studies investigating moderating conditions of the influence of feelings were included, unless the availability of *related* thought content (but not previously provided or previously self-generated information) or processing latencies suggest that the impact of feelings on judgments was mediated by content-priming.
- ² The results reported by Kühnen (2010) hold that feelings of ease-of-retrieval influence judgments, particularly when made salient by means of a manipulation check. Since other researchers reported ease-of-retrieval effects even when the manipulation check was

assessed after the judgments (e.g., Greifeneder et al., 2009a; Schwarz et al., 1991) or not at all (e.g., Tversky & Kahneman, 1973), it would appear unjustified to conclude from this evidence that ease-of-retrieval effects are restricted to conditions in which the manipulation check is assessed first. Rather, it seems that assessing the manipulation check prior to the dependent variables is *one* way of increasing the feelings' context-related salience.

- ³ The terms representativeness and relevance have at times been used interchangeably in the literature, without a common agreed-upon conceptual distinction. This ambiguity conflicts with the objective of this review, which is to provide a clear and mutually exclusive set of moderators. Therefore, findings were categorized according to the definitions provided here, even if it resulted in an assignment of studies to categories different from the labeling initially chosen by the studies' original authors.
- ⁴ The findings reported by Forgas (1992a, 1992b, 1993, 1995b) as well as Forgas and Moylan (1991) have been accrued within the conceptual framework of the priming-account. However, as the reported evidence is compatible with the general tenets of the FI-account, including these findings in the present review appears warranted. Yet, it should be noted that the authors presumed atypicality to be associated with *more elaborate* processing, which contrasts with the presently assumed position that malleability is independent of processing intensity. To underscore their argument, Forgas (1992b), for instance, reported that atypical targets are better remembered than typical targets, supposedly because atypical targets are processed more intensively. However, as discussed earlier and stated by others (e.g., Forgas, 1992b, p. 869; Schwarz & Clore, 2007), alternative explanations for better memory performance are viable. Given this latitude in interpretation, it appears warranted, at present, to maintain the argument that malleability is independent of processing intensity.

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Tables

Table 1

Saliency of Feelings Moderates Their Impact on Judgments

Conceptual differentiation of moderators	Methodological operationalization of moderators	Reliance on feelings ...	Author(s)
<i>Affective feelings</i>			
Context-related	E: Positioning of mood questionnaire before vs. after assessment of dependent variables	... when mood is assessed before judgments.	Siemer & Reisenzein, 1998; White & McFarland, 2009, Exp. 1
Context-related	E: Instruction to become sensitive (or not) to emotional reactions	... when saliency of mood exceeds a threshold.	Albarracín & Kumkale, 2003, Exp. 3
Context-related	E: Variation in processing intensity (low vs. moderate) to influence spontaneous identification of feelings	... when processing intensity is moderate.	Albarracín & Kumkale, 2003, Exp. 1 & 2
Disposition-related	Q: Statistical categorization based on Trait Meta-Mood Scale	... when tendency to pay attention to feelings is high.	Gasper & Clore, 2000, Exp. 1
Disposition-related	Q: Statistical categorization based on Affect Intensity Measure	... when affective experiences are strongly experienced.	Haddock, Zanna, & Esses, 1994*
Disposition-related	Q: Statistical categorization based on Style of Processing scale	... with individual tendency to visualize, thereby putting feelings into focus.	Pham, 1998, Exp. 1
Disposition-related	Q: Statistical categorization based on Openness to Feeling Scale	... when openness to feelings is high.	Ciarrochi & Forgas, 2000*; Forgas & Ciarrochi, 2001*
Disposition-related	Q: Statistical categorization based on Consumer-Impulsiveness Scale	... when impulsivity is high (and processing resources are low), thereby narrowing the focus to feelings.	Shiv & Fedorikhin, 1999, Exp. 2

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Context-related	E: Positioning of manipulation check before vs. after assessment of dependent variables	... when manipulation check was assessed before judgments.	Kühnen, 2010
Context-related	E: Manipulation of contextual salience via task wording	... when cognitive feelings are contextually salient.	Raghubir & Menon, 2005, Exp. 2
Context-related	E: Manipulation of contextual salience via task procedures and priming	... when cognitive feelings are contextually salient.	Hansen & Wänke, 2008

Notes. E = Experimental, Q = Quasi-experimental. * These findings have been accrued in the context of the priming-account, but can be reconciled with the FI-account's central tenets. A pivotal test in favor of the priming-account includes measures of related-thought mediation (see Footnote 1), which, however, were not assessed in these studies.

Table 2

Representativeness Moderates the Impact of Feelings on Judgments

Conceptual differentiation of moderators	Methodological operationalization of moderators	Reliance on feelings ...	Author(s)
		<i>Affective feelings</i>	
Backward-inference	E: Provision of real vs. alleged sources for feelings	... when no target-unrelated source is made salient.	e.g., Gorn, Goldberg, & Basu, 1993; Pham, 1998, Exp. 3; Raghunathan, Pham, & Corfman, 2006, Exp. 1; Schwarz & Clore, 1983; Siemer & Reisenzein, 1998
Backward-inference	E: Variation of attributions: Self- vs. situation-referent attributions	... when making self-referent attributions.	Keltner, Locke, & Audrain, 1993, Exp. 3
Backward-inference	E: Assessment of mood before vs. after dependent variables Q: Statistical categorization based on Trait Meta-Mood Scale and Mood Awareness Scale	... when individuals do not correct for biasing feelings.	McFarland, White, & Newth, 2003
Backward-inference	Q: Statistical categorization based on recall performance Q: Statistical categorization based on political information test	... when expertise is low.	Ottati & Isbell, 1996
Forward-inference	E: Judgments about personal vs. impersonal risks	... when evaluating personal risks.	Gasper & Clore, 1998, Exp. 2
Forward-inference	E: Timing of evaluation of several targets	... for the first option to be evaluated.	Qiu & Yeung, 2008
Forward-inference	E: Judging for the self vs. others	... when judging for the self.	Hsee & Weber, 1997; Loewenstein, Weber, Hsee, & Welch, 2001; Raghunathan & Pham, 1999, Exp. 3
Forward-inference	E: Self- vs. object-referent evaluations	... only for self-referent evaluations.	Gorn, Pham, & Sin, 2001, Exp. 2
Backward- and Forward-inference	E: Variation of attributions and judgmental targets	... when feelings are attributed to the target.	Keltner, Locke, & Audrain, 1993, Exp. 2
Backward- and Forward-inference	E: Decision domains related vs. unrelated to source of feelings	... when source of feelings is related to the decision domain.	Raghunathan, Pham, & Corfman, 2006, Exp. 2 (for conceptually related evidence: Shen & Wyer, 2008)

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Backward-inference	E: Provision of real vs. alleged sources of feelings	... when no target-unrelated source is made salient.	e.g. Greifeneder & Bless, 2007, Exp. 3; Menon & Raghbir, 2003, Exp. 2; Raghbir & Menon, 2001; Ruder & Bless, Exp. 3; Sanna & Schwarz, 2003; Schwarz et al., 1991, Exp. 3; Wänke, Schwarz, Bless, 1995; Winkielman, Schwarz, & Belli, 1998
Forward-inference	E: Self- vs. other-related judgments	... when forming self-related judgments.	Caruso, 2008; Raghbir & Menon, 1998
Forward-inference	E: Judgments about the outgroup or close friends vs. the ingroup or casual acquaintances	... for judgments about the outgroup and close friends.	Rothman & Hardin, 1997

Notes. E = Experimental, Q = Quasi-experimental. Studies in the subcategories “attribution about source of feelings” are not cited comprehensively but in exemplary fashion.

Table 3

Relevance Moderates the Impact of Feelings on Judgments

Conceptual differentiation of moderators	Methodological operationalization of moderators	Reliance on feelings ...	Author(s)
		<i>Affective feelings</i>	
Context-related	E: Variation of consummatory vs. utilitarian goals	... when consummatory goals prevail.	Geuens, Pham, & De Pelsmaker, 2010; Pham, 1998; Yeung & Wyer, 2004 (see Adaval, 2001, for conceptually related evidence)
Context-related	E: Priming of ideals vs. oughts	... when promotion focus prevails.	Pham & Avnet, 2004, Exp. 1 to 3, 2009, Exp. 3 and 4
Context-related	E: Variation of compatibility between achievement vs. protection feelings and according judgmental goals	... when judgmental goals are compatible with affective feelings.	Bosmans & Baumgartner, 2005
Context-related	E: Instructions to use feelings vs. facts as basis for judgments	... when feelings are suggested to be used for judgments.	Gasper & Clore, 2000, Exp. 2; Pham, 1998, Exp. 2; Scarabis, Florack, & Gosejohann, 2006; White & McFarland, 2009, Exp. 1 (see Adaval, 2001, Exp. 2, for conceptually related evidence)
Context-related	E: Manipulation of perceived prior success when relying on feelings as information	... when prior reliance on feelings is perceived as successful.	Avnet & Pham, 2007
Context-related	E: Decisions about present vs. future outcomes	... when deciding about present outcomes.	Chang & Pham, 2010
Disposition-related	Q: Statistical categorization based on State Trait Anxiety Inventory	... when state experiences are consistent with trait experiences.	Gasper & Clore, 1998
Disposition-related	Q: Statistical categorization based on Selves Questionnaire	... when promotion focus prevails.	Pham & Avnet, 2004, Exp. 4, 2009, Exp. 1 and 2
Disposition-related	Q: Statistical categorization based on Rosenberg Self-Esteem Scale E: Recall of memories pertaining to life episodes high or low in self-worth	... when self-esteem or self-worth is high.	Harber, 2005

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Context-related	E: Manipulation of mood states	... in conditions of positive mood.	Ruder & Bless, 2003
Disposition-related	Q: Selection of experts vs. laymen	... by laymen.	Ofir, 2000
Disposition-related	Q: Statistical categorization based on prior knowledge in domain	... in conditions of non-existent prior knowledge.	Florack & Zoabi, 2003
Disposition-related	E: Variation of familiarity with target E: Provision of domain-relevant knowledge via priming	... in conditions of moderate knowledge accessibility.	Tybout, Sternthal, Malaviya, Bakamitsos, & Park, 2005
Disposition-related	Q: Statistical categorization based on Allgemeine Depressions Skala or Beck Depression Inventory	... by low-depressive individuals.	Greifeneder & Bless, 2008
Disposition-related	Q: Statistical categorization based on Faith in Intuition Scale	... when faith in intuition is high.	Keller & Bless, 2008
Disposition-related	Q: Selection of managers vs. subordinates Q: Statistical categorization based on Revised Interpersonal Adjectives Scale E: Recall of prior powerful vs. non-powerful situations	... by powerful people.	Weick & Guinote, 2008

Notes. E = Experimental, Q = Quasi-experimental.

Table 4

Evaluative Malleability of Judgments Moderates the Impact of Feelings on Judgments

Conceptual differentiation of moderators	Methodological operationalization of moderators	Reliance on feelings ...	Author(s)
		<i>Affective feelings</i>	
Judgment-related	E: Variation in specificity of judgment	... when forming global judgments.	Forgas, 1990*; Gorn, Goldberg, & Basu, 1993; Schwarz, Strack, Kommer, & Wagner, 1987
Judgment-related	E: Variation in centrality of self-conceptions	... when peripheral self-conceptions are evaluated.	Sedikides, 1995*
Judgment-related	Q: Selection of experts vs. novices to vary existence of judgmental molds	... by novices.	Forgas & Tehani, 2005*
Target-related	E: Variation in valence of targets	... when targets were affectively neutral.	Isen & Shalke, 1982*
Target-related	E: Variation in valence of targets	... when targets were affectively ambiguous.	Gorn, Pham, & Sin, 2001
Target-related	E: Variation in taste of targets	... when the target product was of "neutral" taste.	Miniard, Bhatla, & Sirdeshmukh, 1992
Target-related	E: Variation in familiarity of target	... when forming judgments about unfamiliar events.	Salovey & Birnbaum, 1989, Exp. 3*
Target-related	E: Variation in typicality of targets	... when judging atypical targets.	Forgas, 1992a*, 1992b*, 1993*, 1995b*; Forgas & Moylan, 1991*
Target-related	E: Variation in amount of target information	... when targets were presented without further information.	Bakamitsos, 2006, Exp. 1; Fedorikhin & Cole, 2004, Exp. 2
Target-related	E: Variation in importance assigned to additional target information	... when additional attribute information is not qualified.	Fedorikhin & Cole, 2004, Exp. 3
Target-related	Q: Selection of experts vs. novices to vary amount of target information	... by novices.	Strull, 1987, Exp. 3
Target-related	E: Manipulation of timing	... when no prior evaluation has been formed.	Fedorikhin & Cole, 2004, Exp. 1; Strull, 1987, Exp. 2; Yeung & Wyer, 2004, 2005, Exp. 2

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Judgment-related	Q: Statistical categorization based on Modern Sexism Scale	... by low-prejudiced individuals.	Dijksterhuis, Macrae, & Haddock, 1999
Judgment-related	Q: Selection of individuals with extreme vs. moderate attitudes based on earlier mass-pretesting	... by participants with moderate attitudes.	Haddock, Rothman, Reber, & Schwarz, 1999

Notes. E = Experimental, Q = Quasi-experimental. * These findings have been accrued in the context of the priming-account, but can be reconciled with the FI-account's central tenets. A pivotal test in favor of the priming-account includes measures of related-thought mediation (see Footnote 1), which, however, were not assessed in these studies.

Table 5

Processing Intensity Moderates the Impact of Feelings on Judgments

Conceptual differentiation of moderators	Methodological operationalization of moderators	Reliance on feelings ...	Author(s)
		<i>Affective feelings</i>	
Processing motivation	Q: Statistical categorization based on Need for Cognition Scale	... when need for cognition is low.	Batra & Stayman, 1990; Petty, Schumann, Richman, & Strathman, 1993, Exp. 1
Processing motivation	E: Variation in personal relevance by linking incentive to experimental materials vs. not	... when personal relevance is low.	Petty, Schumann, Richman, & Strathman, 1993, Exp. 2
Processing motivation	E: Variation in personal relevance by informing participants about the potential of a newspaper interview	... when personal relevance is low.	Bosmans & Baumgartner, 2005, Exp. 2
Processing motivation	E: Variation in relevance by focus on judgmental target vs. peripheral cue Q: Statistical categorization based on various measures of attitudinal partisanship	... when personal relevance is low.	Isbell & Wyer, 1999
Processing motivation	E: Variation in personal relevance by telling participants that judgmental target may be important for themselves vs. not	... when personal relevance is low.	Albarracín & Kumkale, 2003
Processing opportunity	E: Variation of time pressure and task competition	... when opportunity is low.	Siemer & Reizenzein, 1998
Processing opportunity	E: Variation of task competition by remembering a few- vs. many-digit number	... when task competition is high.	Shiv & Fedorikhin, 1999, 2002
Processing opportunity	E: Variation of time pressure	... when time pressure is high.	Pham, Cohen, Pracejus, & Hughes, 2001, Exp. 3
Processing opportunity	E: Memory- vs. stimuli-based choice	... when making memory-based choices.	Rottenstreich, Sood, & Brenner, 2007
Processing opportunity	E: Variation in distractiveness of background sounds	... when distraction is high.	Albarracín & Kumkale, 2003; Albarracín & Wyer, 2001

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Processing motivation	Q: Statistical categorization based on family history of heart disease E: Variation of personal relevance by focusing retrieval task on self vs. average man	... when personal relevance is low.	Rothman & Schwarz, 1998
Processing motivation	Q: Selection based on scores of Rape Myth Acceptance Scale	... when personal relevance is low.	Grayson & Schwarz, 1999
Processing motivation	Q: Statistical categorization based on personal interest in politics	... when personal relevance is low.	Haddock, 2002
Processing motivation	Q: Statistical categorization based on Need for Cognition Scale	... when need for cognition is low.	Florack & Zoabi, 2003
Processing motivation	E: Variation in personal relevance by thinking about trivial vs. serious disease symptoms	... when personal relevance is low.	Broemer, 2004, Exp. 3
Processing motivation	E: Variation of personal relevance by announcement of justification	... when personal relevance is low.	Greifeneder, 2007, Exp. 2
Processing motivation	E: Variation in accuracy motivation by asking for accurate vs. rough judgments	... when accuracy motivation is low.	Aarts & Dijksterhuis, 1999, Exp. 2; Greifeneder, 2007, Exp. 1
Processing motivation	Q: Statistical categorization based on Labile Self-Esteem Scale E: Manipulation of certainty vs. uncertainty salience	... when uncertainty is low.	Greifeneder, Müller, Stahlberg, van den Bos, & Bless, 2009a, 2009b; Müller, Greifeneder, Stahlberg, van den Bos, & Bless, 2010
Processing motivation	Q: Statistical categorization based on Need for Cognition Scale	... when need for cognition is high.	Tormala, Petty, & Briñol, 2002, Exp. 1; Wänke & Bless, 2000, Exp. 1
Processing motivation	E: Variation in accuracy by instruction to report accurate vs. spontaneous reactions	... when accuracy motivation is high.	Wänke & Bless, 2000, Exp. 2
Processing motivation	E: Variation of personal relevance by several measures	... when personal relevance is high.	Tormala, Petty, & Briñol, 2002, Exp. 2
Processing motivation	Q: Statistical categorization based on Need for Structure Scale	... when need for structure is high.	Hirt, Kardes, & Markman, 2004
Processing opportunity	E: Variation of task competition by remembering a few- vs. many-digit number	... when opportunity is low.	Greifeneder & Bless, 2007

Notes. E = Experimental, Q = Quasi-experimental.