Meaning in Context:

Metacognitive Experiences

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As psychologists have long been aware, human cognition is highly context sensitive. How we perceive simple objects, comprehend texts and utterances, form evaluative judgments, make sense of others' behavior and perform a myriad of other tasks is profoundly influenced by the immediate context in which the respective task is situated. To account for such influences, researchers commonly assume that the context influences the accessibility of applicable knowledge, which is brought to bear on the task at hand (for reviews see Förster & Liberman, 2007; Higgins, 1996). Under most natural conditions, this context sensitivity is adaptive by privileging information that is relevant in the cur rent situation at the expense of other information that may be less germane, given current circumstances (for discussions see Schwarz, 2007; Smith & Collins, this volume). However, the common focus on knowledge accessibility misses that there is more to thinking than *what* comes to mind.

Thinking is accompanied by a host of subjective experiences, from metacognitive feelings of ease or difficulty to affective reactions and bodily sensations. As Higgins (1998) noted, people commonly assume that any thoughts that come to mind and any feelings they experience while thinking about something bear on what they are thinking about – or why else would they have these thoughts and feelings now, at this moment? Hence, people draw on their feelings as a source of information, unless they become aware that their feelings may be due to an irrelevant source, thus undermining the feeling's perceived relevance to the task at hand (for a review see Schwarz & Clore, 2007). Accordingly, we cannot predict a person's judgments or decisions by merely knowing *what* came to mind without taking the accompanying subjective experiences into account. Adding further complexity, the meaning of subjective experiences is itself malleable and the same experience can convey different information in different contexts.

The present chapter addresses a particular type of subjective experience, namely the metacognitive feelings that arise from monitoring one's own cognitive processes. Not surprisingly, processing new information, retrieving information from memory and generating thoughts can be experienced as easy or difficult. Because numerous different variables – from environmental conditions and the information's presentation format to the nature of the task and the person's knowledge and bodily state – can make processing easy or difficult, the specific meaning of the experience is ambiguous and requires interpretation: Is this text difficult to make sense of because I'm distracted, because I know little about the topic, because the print font is hard to read or because the argument is utter nonsense? How people interpret their metacognitive experiences depends on which of many potentially relevant variables they attend to and which of many potentially applicable naïve theories of mental processes they bring to bear. In most cases, an applicable theory, entailing a specification of relevant variables, is

brought to mind by the task they face; if not, it may be constructed on the spot to make sense of the experience in the given context. As in other domains of judgment, people are likely to rely on the most accessible theory without considering plausible alternatives, unless the first interpretation tried fails to yield a plausible result. This limited exploration of plausible alternatives is consistent with the assumption that our feelings are "about" whatever is in the focus of attention. As a result, the meaning of metacognitive experiences is itself highly malleable and context sensitive.

As this discussion indicates, the role of contextual influences in judgment is more complex than the common focus on knowledge accessibility suggests. At the first level, contextual variables like previous exposure, primes or task characteristics influence *what* comes to mind, as assumed by knowledge accessibility models. At the second level, contextual variables also influence the metacognitive experience, that is, how *easily* information can be retrieved from memory, thoughts can be generated, or novel material can be processed, giving rise to differential inferences from the same declarative inputs. At the third level, contextual variables further influence how the metacognitive experience is *interpreted*, giving rise to differential inferences from the same experience with differential downstream implications for inferences from declarative inputs.

The interplay between these different levels is the topic of the present chapter. The first section addresses the fluency with which new information can be processed, whereas the second section addresses the fluency of recall and thought generation. Both sections highlight how metacognitive experiences give rise to different inferences from declarative inputs and how naïve theories of the mind change the conclusions drawn from a given experience. The third section illustrates how metacognitive experiences can affect individuals' choice of processing strategies. The chapter concludes by noting parallels between the use of metacognitive experiences and other feelings as a source of information, placing the findings in the context of a general feelings-as-information approach to the interplay of declarative and experiential information (Schwarz, 1990; Schwarz & Clore, 2007). Throughout, the review is illustrative rather than exhaustive.

THE EASE OF PROCESSING NEW INFORMATION: PROCESSING FLUENCY

Numerous variables can influence the ease or difficulty with which new information can be processed. Some of these variables affect the speed and accuracy of low-level processes concerned with the identification of a stimulus' physical identity and form; they influence *perceptual fluency* (e.g., Jacoby, Kelley & Dywan, 1989). Relevant variables include figure-ground contrast, the clarity with which

a stimulus is presented, the duration of its presentation, or the amount of previous exposure to the stimulus. Other variables influence the speed and accuracy of high-level processes concerned with the identification of stimulus meaning and its relation to semantic knowledge structures; these variables influence *conceptual fluency* (e.g., Whittlesea, 1993). Relevant variables include semantic predictability, the consistency between the stimulus and its context, and the availability of appropriate mental concepts for stimulus classification. Empirically, both types of fluency tend to show parallel influences (for a review see Winkielman, Schwarz, Fazendeiro, & Reber, 2003) and can be subsumed under the general term *processing fluency*.

What Does the Experience Mean?

Because the diverse variables that influence processing fluency result in similar phenomenological experiences of fluent processing, the meaning of the experience is open to interpretation. Which interpretation people choose, and which inferences they draw from their experience, depends on which of many applicable naïve theories is brought to mind by the current context, most notably by the task posed. Some of these theories pertain to characteristics of the stimulus and presentation conditions, whereas others pertain to one's own state of knowledge.

Stimulus-related theories include, for example, that it is easier to perceive a stimulus when it is shown with high rather than low clarity and for a long rather than short duration. These assumptions affect judgments of clarity and duration, even when the fluency experience is due to some other variable, like previous exposure to the stimulus. Hence, people who saw the stimulus before infer that the current presentation lasted longer, or had higher clarity, than people who were not previously exposed to the stimulus (e.g., Witherspoon & Allan, 1985; Whittlesea, Jacoby & Girard, 1990). Similarly, Masson and Caldwell (1998) observed that participants inferred that a target word was presented for a longer duration, or with higher visual clarity, when a preceding semantic task (e.g., complete the sentence, "An archer shoots a bow and ____") had rendered the target word ("arrow") highly accessible. In these cases, fluency resulting from previous exposure to the stimulus or related concepts gave rise to erroneous inferences about physical characteristics of the stimulus once the physical judgment task brought an applicable theory to mind (see Kelley & Rhodes, 2002, for a review).

Other naïve theories relate processing fluency to one's own state of knowledge. The most important one holds that familiar (previously seen) material is easier to process than novel material. Accordingly, people erroneously conclude that novel material is familiar when it is easy to process due to the influence of other variables. For example, Whittlesea and colleagues (1990) exposed participants to a study list of rapidly presented words. Subsequently, participants completed a recognition test that

manipulated the fluency with which test words could be processed through differential visual clarity. As expected, test words shown with higher clarity seemed more familiar and were hence more likely to be "recognized" as having appeared on the previous list. This effect was eliminated when participants were aware that the clarity of the visual presentation was manipulated and hence attributed their fluency experience to this source, rendering it uninformative for the recognition task.

Fluency and Familiarity: Judgments of Risk, Consensus, and Truth

Fluency-based impressions of familiarity have important implications for a wide range of judgments that are relevant in daily life, including assessments of risk, social consensus and truth.

Judgments of Risk

Not surprisingly, familiarity figures prominently in intuitive assessments of risk – if a stimulus is familiar and elicits no negative memories, it presumably hasn't hurt us in the past. Accordingly, incidental variables that affect processing fluency may influence peoples' risk assessments. Confirming this prediction, Song and Schwarz (in press a) observed that ostensible food additives were rated as more likely to be hazardous when their names were difficult (e.g., Fluthractnip) rather than easy (e.g., Magnalroxate) to pronounce. Moreover, the effect of ease of pronunciation on risk ratings was mediated by the perceived novelty of the stimuli.

Highlighting the real-world implications of this observation, Alter and Oppenheimer (2006) found that initial public offerings on the New York Stock Exchange provided a higher return on investment when their ticker symbol was easy (e.g., KAR) rather than difficult to pronounce (e.g., RDO). This effect was most pronounced on the first day of trading, when investing $1,000 in a basket of stocks with fluent ticker symbols would have yielded an excess profit of $85.35 over a basket with disfluent ticker symbols; this advantage was reduced to a still impressive $20.25 by the end of the first year of trading, as more information about the companies became available.

In addition to the mediating role of perceived familiarity observed by Song and Schwarz (in press a), intuitive assessments of risk may be further affected by perceivers' positive affective response to fluently processed stimuli (addressed below), consistent with the observation of mood effects on judgment of risk (e.g., Johnson & Tversky, 1983) and the beneficial influence of sunny weather on the stock market (e.g., Hirshleifer & Schumway, 2003). Future research may fruitfully address the relative contributions of familiarity and affect in mediating the observed fluency effects.

Social Consensus and Truth

When the objective truth of a statement is difficult to evaluate, people often draw on social consensus information to arrive at a judgment, based on the assumption that what many people believe

is probably true (Festinger, 1954). To determine whether they "heard it before," people may assess the apparent familiarity of the information, drawing on the fluency with which it can be processed as a relevant input (e.g., Weaver, Garcia, Schwarz, & Miller, 2007). If so, variables that increase processing fluency should increase the perceived truth value of the processed information. Empirically, this is the case.

Not surprisingly, one relevant variable is actual exposure frequency. In a classic study of rumor transmission, Allport and Lepkin (1945) observed that the strongest predictor of belief in wartime rumors was simple repetition. Numerous subsequent studies demonstrated that a given statement is more likely to be judged "true" the more often it is repeated. This illusion of truth effect (Begg, Anas, & Farinacci, 1992) has been obtained with trivia statements or words from a foreign language (e.g., Hasher, Goldstein, & Toppino, 1977) as well as advertising materials (e.g., Hawkins & Hoch, 1992).

Illusions of truth are even observed when participants are explicitly told at the time of exposure that the information is *false.* Skurnik, Yoon, Schwarz, and Park (2005) exposed older and younger adults once or thrice to product statements like, "Shark cartilage is good for your arthritis" and these statements were explicitly marked as "true" or "false." As may be expected, all participants were less likely to accept a statement as true the more often they were told that it is false – but only when they were tested immediately. After a three-day delay, repeated warnings backfired for older adults: They were now more likely to assume that a statement is true, the more often they were explicitly told that it is false. This finding is consistent with the observation that explicit memory declines with age, whereas implicit memory remains largely intact (Park, 2000). Hence, after a three day delay, older adults could not recall whether the statement was originally marked as true or false, but still experienced its content as highly familiar, leading them to accept it as true. Ironically, this mechanism turns warnings into recommendations, with important implications for public education campaigns (for a review see Schwarz, Sanna, Skurnik, & Yoon, 2007).

Theoretically, any other variable that increases processing fluency should have the same effect as message repetition. Supporting this prediction, Reber and Schwarz (1999) found that participants were more likely to accept statements like "Osorno is a city in Chile" as true when the statements were presented in colors that made them easy (e.g., dark blue) rather than difficult (e.g., light blue) to read against the background. Similarly, McGlone and Tofighbakhsh (2000) manipulated processing fluency by presenting substantively equivalent novel aphorisms in a rhyming (e.g., "woes unite foes") or non-rhyming form (e.g., "woes unite enemies"). As expected, participants judged substantively equivalent aphorisms as more true when they rhymed than when they did not.

In combination, these findings indicate that processing fluency serves as an experiential basis of truth judgments. In the absence of more diagnostic information, people draw on the apparent familiarity of the statement to infer its likely truth value. This inference is based on the (usually correct) assumption that widely shared opinions are both more likely to be familiar and more likely to be correct than more idiosyncratic ones. Hence, if it seems like they heard it before, there's probably something to it. By the same token, people should infer that apparently familiar information is likely to be false when they have reason to believe that false information is more common in the given context. Empirically, this is the case and fluency can result in inferences of truth or falseness, depending on people's assumptions about the prevalence of truth and falseness in the relevant environment (e.g., Skurnik, Schwarz, & Winkielman, 2000; Unkelbach, 2007).

Fluency and Affect: Judgments of Preference and Beauty

The judgment effects reviewed so far can be plausibly traced to inferences that are based on the experience of fluent processing itself. However, a second factor contributes to the pervasive influence of processing fluency. High processing fluency is experienced as pleasant and elicits a positive affective reaction that can be captured with psychophysiological measures (Winkielman & Cacioppo, 2001). The positive affective reaction, in turn, can itself serve as a basis of judgment, providing an alternative pathway for fluency effects that is particularly relevant to judgments of preference (Winkielman, Schwarz, Fazendeiro, & Reber, 2003). What is less clear is *why* processing fluency is experienced as affectively positive. Relevant proposals range from the adaptive value of a preference for familiar stimuli (Zajonc, 1968) to the adaptive value of fast stimulus identification (Winkielman, Schwarz, & Nowak, 2002) and their empirical evaluation awaits further research.

In his classic demonstration of the mere exposure effect, Zajonc (1968; for a review see Bornstein, 1989) showed that repeated exposure to a stimulus results in more positive evaluations and several researchers suggested that this observation is a function of increased processing fluency (e.g., Jacoby et al., 1989; Seamon, Brody & Kauff, 1983). If so, *any* variable that facilitates fluent processing should also facilitate positive evaluations, even with a single exposure. Numerous studies support this prediction. For example, Reber, Winkielman, and Schwarz (1998) presented participants with slightly degraded pictures of everyday objects and manipulated processing fluency through a visual priming procedure. Depending on conditions, the target picture was preceded by a subliminally presented, highly degraded contour of either the target picture or a different picture. As predicted, pictures preceded by matched contours were recognized faster, indicating higher fluency, and were liked more

than pictures preceded by mismatched contours. Extending this work, Winkielman and Fazendeiro (reported in Winkielman et al. 2003) showed participants unambiguous pictures of common objects and manipulated processing fluency through semantic primes. In the high fluency condition, the picture (e.g., of a lock) was preceded by a matching word (e.g., "lock"), in the moderate fluency condition by an associatively related word (e.g., "key"), and in the low fluency condition by an unrelated word (e.g., "snow"). As predicted, pictures preceded by matching words were liked more than pictures preceded by related words, which, in turn, were liked more than pictures preceded by unrelated words. This positive effect of processing fluency was eliminated when participants attributed their positive affective response to music played in the background, as has previously been observed for the influence of moods (Schwarz & Clore, 1983).

Lee and Labroo (2004; see also Labroo, Dhar, & Schwarz, 2008) obtained similar findings in the consumer domain. They found, for example, that consumers reported more positive attitudes toward ketchup when they were previously exposed to a closely related product (mayonnaise) rather than an unrelated one. Presumably, the closely related product facilitated processing of the target product, much as related semantic primes facilitated processing of the target pictures in Winkielman and Fazendeiro's study.

Numerous other variables that affect processing fluency produce parallel effects, from figure-ground contrast and presentation duration (e.g., Reber et al. 1998) to the prototypicality of the stimulus (e.g., Halberstadt & Rhodes 2000; Langlois & Roggman 1990). Moreover, the influence of many variables addressed in the psychology of aesthetics (Arnheim 1974), like figural goodness, symmetry, and information density, can be traced to the mediating role of processing fluency: All of these variables facilitate stimulus identification and elicit more positive evaluations. Based on these and related findings, Reber, Schwarz, and Winkielman (2004) proposed a fluency theory of aesthetic pleasure that assigns a central role to the perceiver's processing dynamics: The more fluently perceivers can process a stimulus, the more positive is their aesthetic response. This proposal provides an integrative account of diverse variables and traces their influence to the same underlying process. First, *image variables* that have long been known to influence aesthetic judgments, like figural goodness, figure-ground contrast, symmetry, and prototypicality, exert their influence by facilitating or impairing fluent processing of the stimulus. Second, *perceiver variables,* like a history of previous exposure or a motivational state to which the stimulus is relevant, similarly exert their influence through processing fluency. Third, *contextual variables,* like visual or semantic priming, that play no role in traditional theories of aesthetics operate in the same fashion and also affect aesthetic appreciation through their influence on processing fluency.

Finally, it is worth noting that the relationship between perceived familiarity and affective response is bi-directional. As Monin (2003) demonstrated, stimuli that evoke a positive affective response are judged more familiar, even when fluency of processing is controlled for. Similarly, Garcia-Marques and Mackie (2001) observed that participants in a good mood are more likely to perceive novel arguments as familiar, which may contribute to their acceptance as true.

Summary

In sum, processing fluency influences judgment through two related pathways. First, people attend to the dynamics of their own information processing and draw on the experience of fluent or disfluent processing as a source of information. What they conclude from their fluency experiences, however, depends on which of many potentially applicable naïve theories of information processing is brought to mind by contextual variables, most notably the task posed.

Second, high fluency elicits spontaneous positive affective reactions, which provide further experiential information, paralleling the influence of moods and emotions. Neither source of experiential information exerts an influence when its informational value for the judgment at hand is called into question. This is the case when judges are aware that their fluency experience (for a review see Kelley & Rhodes, 2002) or apparent affective reaction to the target (for a review see Schwarz & Clore, 2007) is due to an irrelevant source.

Finally, some phenomena are likely to reflect the operation of both processes. For example, studying the role of processing fluency in consumer choice, Novemsky and colleagues (2007) presented participants with descriptions of two digital cameras. As expected, participants were less likely to defer choice when the print font of the description was easy (56% deferral) rather than difficult to read (71% deferral), unless their attention was explicitly drawn to the font (57% deferral). This result may reflect that the described cameras seemed less attractive under low fluency conditions or that the information seemed less familiar and credible, both of which could contribute to a higher rate of deferral.

THE EASE OF RECALL AND THOUGHT GENERATION: ACCESSIBILITY EXPERIENCES

The same conceptual logic applies to the ease or difficulty of recall and thought generation. Information can be easy or difficult to bring to mind for many different reasons and what people conclude from these *accessibility experiences* depends on which of many naïve theories of mental processes they bring to bear. Some naïve theories link accessibility experiences to characteristics of the object of judgment, like the frequency or temporal distance of events, whereas others link them to the state of one's own knowledge, like one's expertise or interest, or to characteristics of the current

situation, like factors that may be distracting. Whenever the experience is attributed to a source that is irrelevant to the target judgment, its informational value is discredited and people draw on other inputs, usually the declarative information they brought to mind.

What Does the Experience Mean?

One widely applicable naïve theory holds that the more exemplars exist, the easier it is to bring some to mind. This correct belief is at the heart of Tversky and Kahneman's (1973) availability heuristic and people infer higher frequency and probability from ease of recall. Because frequent exemplars are also more typical for their category, ease of recall further suggests high typicality. Accordingly, people infer that they use their bicycles more often after recalling few rather than many instances (Aarts & Dijksterhuis, 1999); rate themselves as more assertive after recalling few rather than many of their own assertive behaviors (Schwarz et al., 1991); like Tony Blair more after listing few rather than many of favorable thoughts about him (Haddock, 2002); hold an attitude with more confidence after generating few rather than many supporting arguments (Haddock et al., 1999); consider an event more likely the more reasons they generate for why it might *not* have occurred (Sanna, Schwarz, & Stocker, 2002); and are more likely to defer choice after listing many rather than few reasons for making a choice (Novemsky et al., 2007).

When people apply this naïve theory, their inferences are consistent with the implications of *what* comes to mind when recall or thought generation is easy, but opposite to these implications when it is difficult. Several lines of evidence indicate that these effects are due to metacognitive experiences rather than to differences in the quality of examples listed. First, external raters detect no quality difference between the first and last two examples listed (e.g., Schwarz et al., 1991). Second, yoked participants, who merely read the thoughts generated by another and are hence deprived of the generation experience, are more influenced when their partner lists many rather than few arguments, in contrast to the person who lists them (e.g., Wänke, Bless, & Biller, 1996). Third, and most important, the impact of metacognitive experiences is eliminated when the experience is misattributed to an external influence, like music played in the background. In this case, participants draw on accessible content, and rate themselves as more assertive the more examples of assertive behavior they listed, thus reversing the otherwise observed pattern (Schwarz et al., 1991; for conceptual replications see Haddock et al.,

1999; Novemsky et al., 2007; Sanna, Schwarz, & Small, 2002).[1] Finally, the same effect can be observed when all participants list the same number of thoughts and their subjective experience of difficulty is manipulated through facial feedback in the form of corrugator contraction, an expression associated with mental effort (e.g., Stepper & Strack, 1993; Sanna, Schwarz, & Small, 2002).

Other naïve theories of memory correctly hold, for example, that it is easier to recall events that are well rather than poorly represented in memory; that one found important when they occurred; or that happened in the recent rather than distant past. Accordingly, people infer higher childhood amnesia after successfully recalling 12 rather than 4 childhood events (Winkielman, Schwarz, & Belli, 1998) and consider past events less important, and date them as having occurred at a more distant time, after recalling many rather than few details (Schwarz & Xu, 2008). People further assume that it is easier to recall material in one's domain of interest and that a lack of expertise renders recall and thought generation difficult. Hence, they infer, for example, that they are not very interested in politics when they find it difficult to answer political knowledge question – unless they can attribute the difficulty to an external source, like a lack of media coverage (Schwarz & Schuman, 1997). Conversely, attributing any experienced difficulty to one's lack of knowledge renders it uninformative judgments about states of the world (e.g., Sanna & Schwarz, 2003).

Determinants and Consequences of Theory Selection

Given that different naïve theories are applicable to the same accessibility experience, it is important to understand the determinants of their use. As in the case of fluency experiences, a key determinant is the judgment task itself, which recruits an applicable inference rule that allows the perceiver to get from "here" (the available data) to "there" (the judgment of interest). For example, Schwarz and Xu (2008) asked students to list two or six "fine Italian restaurants" in town. When first asked how many fine Italian restaurants the city has, they inferred from the difficulty of listing six that there can't be many. This inference is consistent with Tversky and Kahneman's (1973) availability

[1] These findings also bear on Tormala and colleagues' (2007) observation that participants who attempt to list many thoughts may also have more unrequested thoughts; for example, those asked to list many favorable thoughts may also find a larger number of unfavorable thoughts coming to mind. They suggested that these unrequested thoughts, rather than the experience of difficulty per se, may drive the reviewed effects. If so, the pattern of participants' judgments should not reverse when the diagnostic value of the metacognitive experience is called into question – attributing one's difficulty to background music (Schwarz et al., 1991), for example, does nothing to discredit the substantive relevance of any unrequested thoughts one might have had. While unrequested thoughts are probably part and parcel of the experience of difficulty, they do not provide a coherent account of the available findings.

heuristic. However, when first asked how much they know about town, they inferred from the same difficulty that they are quite unfamiliar with their college town. Theoretically, each of these judgments entails an attribution of the recall experience to a specific source, either to the number of restaurants in town or to one's own expertise. Once this implicit attribution is made, the experience is "explained" and should become uninformative for judgments that require a different theory, making it likely that people turn to accessible thought content instead. Confirming this prediction, participants who first concluded that there are few fine Italian restaurants in town subsequently reported high expertise—after all, there aren't many such restaurants and they nevertheless could list quite a few, so they must know a lot about town. Conversely, those who first concluded that their difficulty reflects a lack of knowledge subsequently inferred that there are many fine Italian restaurants—after all, they had listed quite a few and they didn't even know much about town.

In a conceptual replication, Schwarz and Xu (2008) asked participants to recall details of the Oklahoma City bombing. When first asked to date the event, they inferred that it was more recent after recalling two rather than ten details; but when first asked how important the event was to them at the time, they inferred higher importance after recalling two rather than ten details. Again, these judgments entail an attribution of the experience to a specific cause (here, recency or importance), rendering the experience uninformative for other judgments. Accordingly, participants who initially attributed the difficulty of recalling many details to the event's temporal distance subsequently reported that the event was quite important to them–-after all, they had just recalled numerous details even though the event had apparently happened long ago. Conversely, participants who initially attributed difficulty of recall to low personal importance subsequently dated the event as closer in time – after all, they could still recall numerous details despite the event's low personal importance.

Summary

In sum, recall and thought generation can be experienced as easy or difficult. What people conclude from these accessibility experiences depends on which of many potentially applicable naïve theories of memory and cognition is brought to mind by the present context. In most cases, applicable theories are recruited by the judgment task and the same experience can result in different substantive conclusions, depending on the specific theory applied. Moreover, every theory-based judgment entails a causal attribution of the experience to the source specified in the naïve theory. Accordingly, the first judgment can serve as a context that undermines the informational value of the experience for later judgments that require the application of a different theory, much as has been observed for other (mis)attribution manipulations (for a review see Schwarz & Clore, 2007). Once the informational value of

the experience is called into question, people turn to the content of their thoughts as an alternative source of information. Hence, subsequent judgments are content rather than experience based, resulting in a reversal of the otherwise observed effects.

While numerous studies converge on the conclusion that people will only rely on their metacognitive experiences when their informational value is not called into question (Schwarz & Clore, 2007), less is known about the conditions that determine the relative impact of experiential and declarative information. On the one hand, some findings are compatible with a conceptualization of metacognitive experiences as heuristic cues that are more likely to dominate judgment when processing motivation (e.g., Rothman & Schwarz, 1998) or capacity (e.g., Greifeneder & Bless, 2008) are low. On the other hand, fluent processing usually increases people's confidence in the content of their thoughts (e.g., by suggesting high expertise or a large body of supportive evidence), which exerts more influence on judgment when processing motivation and capacity are high (for a review see Petty et al., 2007). Hence, metacognitive experiences are likely to influence judgment under heuristic/intuitive as well as systematic/analytic processing conditions. A systematic exploration of these contingencies promises further insight into the contextualized interplay of experiential and declarative information in human reasoning.

METACOGNITIVE EXPERIENCES AND THE CHOICE OF PROCESSING STRATEGIES

As already seen, people draw on their metacognitive experiences to assess their own knowledge and various task characteristics. These assessments also inform their choice of processing strategies. When asked to answer a question, for example, people may feel that they know the correct answer even though they are currently unable to bring it to mind. In many cases, this *feeling of knowing* is based on the ease with which partial information comes to mind (Koriat, 1993); in other cases it is based on the apparent familiarity of the cues provided in the question (Reder & Ritter, 1992). In either case, people are more likely to engage in detailed retrieval efforts the higher their feeling of knowing (e.g., Costermans, Lories, & Ansay, 1992). On the other hand, easy retrieval of a plausible answer results in high *confidence* and truncates the search process, making more detailed scrutiny of the answer unlikely (for a discussion see Petty, Brinol, Tormala, & Wegener, 2007).

While the above processing decisions are based on assessments of one's own knowledge, metacognitive experiences are likely to inform a wide range of strategy choices, a possibility that awaits systematic investigation. In general, people prefer processing strategies that have been characterized as analytic, systematic, bottom-up and detail-oriented when they consider their current situation "problematic," but prefer strategies that have been characterized as intuitive, heuristic, and top-down

when they consider their current situation as “benign” (Schwarz, 1990). Numerous variables, from task characteristics to incidental environmental cues, moods, and bodily approach or avoidance feedback can convey this information and have been found to influence processing style (for reviews see Schwarz, 2002; Schwarz & Clore, 2007). One of these variables is the fluency with which information can be processed. For example, when asked, “How many animals of each kind did Moses take on the arch?” most people answer “two” despite knowing that the biblical actor was Noah (Erickson & Mattson, 1981). Presenting this Moses question in a difficult to read print font dramatically reduces reliance on the first answer that comes to mind and increases the recognition that the question cannot be answered as asked; on the other hand, a difficult to read print font impairs performance when the first spontaneous association is correct (Song & Schwarz, in press b). Both observations presumably reflect that familiar questions, and the associations they bring to mind, receive less scrutiny than unfamiliar ones. Similarly, Alter, Oppenheimer, Epley, and Norwick (2007) reported that manipulations that increased subjective processing difficulty improved participants’ performance on reasoning tasks that benefit from a more analytic processing style.

Note, however, that the influence of metacognitive experiences on strategy choice is bound to be as malleable as their influence on judgment. Inferring that the task is unfamiliar, for example, may abort any attempt to engage in effortful analytic processing when the task seems to require background knowledge that one is likely to lack, given the task’s low familiarity. Future research may fruitfully explore how contextual variables that shape the inferences drawn from a given metacognitive experience affect subsequent strategy choices.

CODA

After decades of pervasive "neglect of conscious experience" (Tulving, 1989, p. 4), it is now increasingly acknowledged that an understanding of human cognition requires attention to the subjective experiences that accompany cognitive processes. Consideration of these experiences adds new complexity to theorizing about the “mind in context,” even if we limit the context to the immediate task environment and ignore the broader social and cultural context in which it is embedded. As numerous social cognition studies into the effects of knowledge accessibility demonstrated (for reviews see Higgins, 1996; Förster & Liberman, 2007), contextual variables influence what comes to mind and which declarative information is used in forming a judgment. Knowing the accessible declarative inputs, however, is insufficient to predict the final judgment because the implications of the declarative information are qualified by accompanying subjective experiences (Schwarz & Clore, 2007), including the metacognitive experiences reviewed in this chapter. These metacognitive experiences, in turn, are

themselves a function of contextual variables that influence how easily information can be retrieved from memory, thoughts can be generated, or novel material can be processed. Moreover, what people conclude from the experience of easy or difficult processing depends on which of many potentially applicable naïve theories of mental processes they bring to bear, which is again a function of contextual variables, most notably the task on their mind. Finally, application of a given theory to form an initial judgment entails an attribution of the experience to a specific source, which renders the experience uninformative for subsequent judgments that require the application of a different theory. Hence, the final judgment emerges from a systematic interplay of accessible declarative and experiential inputs, each of which is subject to multiple contextual influences – and a minor change in context, like the order in which two questions are asked (Schwarz & Xu, 2008), may be sufficient to reverse the otherwise obtained outcome.

What are we to make of this contextual malleability of human judgment? Taking the reviewed experiments at face value, our perception of reality is subject to numerous haphazard influences, leaving one to wonder how we make it through the day. From a broader perspective however, the observed contextual malleability is compatible with the assumption that thinking is for doing (James, 1890), which requires high sensitivity to the context in which things are to be done (see Smith & Collins, this volume). Hence, information that is relevant in a given context should indeed be privileged at the expense of less relevant information, making context dependent knowledge accessibility an adaptive feature. The accompanying metacognitive experience that the information comes to mind easily may further highlight its relevance, giving it an advantage over less accessible and presumably less relevant information. Similarly, the fluency with which new information can be processed will indeed often reflect previous exposure, making it a valid indicator of familiarity. Moreover, the meaning that we impose on a given metacognitive experience should indeed be the meaning that is most relevant to the task at hand and the recruitment of task-relevant naïve theories facilitates this. From this perspective, the basic processes identified in the present chapter are adaptive rather than dysfunctional.

Unfortunately, however, this is only part of the story. While we are very sensitive to our subjective experiences, we are utterly insensitive to their source. We mistake our pre-existing moods as our reaction to the object of judgment (e.g., Schwarz & Clore, 1983), fail to recognize that recall is only difficult because we are asked to recall too large a number of examples (e.g., Schwarz et al., 1991), and we misread the fluency resulting from easy or difficult to read presentation formats (e.g., Reber & Schwarz, 1999) as indicative of the actual familiarity of the material. Throughout, we treat our thoughts and feelings as bearing on the specific task at hand and rarely consider the possible influence of

incidental variables, unless our attention is explicitly drawn to them (Higgins, 1998; Schwarz, 1990). While the resulting errors of judgment may be less common in the wild than in experiments with carefully managed incidental influences, the emergence of fluency (Alter & Oppenheimer, 2006) and mood (Hirshleifer & Shumway, 2003) effects on stock prices illustrates that they are certainly not restricted to laboratory studies with inconsequential tasks. Being blissfully unaware of incidental influences and alternative interpretations, we experience our judgments as a compelling reflection of reality, although a different question may result in the construction of a different reality from the same inputs – a naïve realism that protects us from a continuous sense of uncertainty (see Dunham & Banaji, this volume, and Ross & Ward, 1996, for related discussions).

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