

Accessibility Revisited

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Highlighting the role of information accessibility in human judgment has been one of the core contributions of social cognition research. Building on the path breaking work of Higgins, Wyer, and colleagues (e.g., Higgins, Rholes, & Jones, 1977; Srull & Wyer, 1979), researchers documented the profound influence of "what happens to come to mind" across many content domains (for reviews see Bodenhausen & Wyer, 1987; Higgins, 1996; Wyer & Carlston, 1979; Wyer & Srull, 1989). As Wyer and Srull (1989, p. 103) put it in their integrative review, "the knowledge we have acquired and used most recently has a disproportionate influence on judgments and decisions to which it is relevant. These effects (...) appear to be evident at all stages of information processing." This insight has changed the field's perspective on human judgment and has become one of the most influential ideas that social psychology contributed to the social sciences at large, as illustrated by its influence in public opinion research (Kinder, 1998), political science (Ottati, 2001), consumer research (Shavitt & Wänke, 2001) and survey methodology (Sudman, Bradburn, & Schwarz, 1996; Tourangeau, Rips, & Rasinski, 2000). Three related propositions received particular attention and have acquired the status of truisms in social cognition research.

First, when forming a judgment, individuals rarely retrieve all information that may be relevant but truncate the search process as soon as "enough" information has come to mind to form a judgment with sufficient subjective certainty. Accordingly, the judgment is primarily based on the subset of information that is most accessible at the time. We refer to this assumption as Proposition 1.

Second, when individuals encounter new information, they usually do not entertain multiple possible interpretations. Instead, they interpret the information in terms of the most accessible concept that is applicable to the material at hand. Accordingly, accessible concepts of differential valence can give rise to differential interpretations, which result in differential evaluative judgments. We refer to this assumption as Proposition 2.

A third assumption holds that accessibility effects on overt behavior are mediated by differential interpretations of the situation. In the words of Wyer and Srull (1989, p. 147), "concepts that happen to be activated at the time (?) events are experienced may influence the

interpretation of the events and therefore may influence behavioral decisions." We refer to this assumption as Proposition 3.

These three propositions have received ample support across many content domains and are compatible with associative network models (e.g., Wyer & Carlston, 1979) as well as bin models (e.g., Wyer & Srull, 1989) of human memory. Nevertheless, they share the fate of many other exceptionally fruitful ideas in the history of science (see Root-Bernstein, 1989): By stimulating diverse novel lines of inquiry, they run the risk of eventually encountering data that are incompatible with the original formulation. In the present case, the accumulating body of research into knowledge accessibility increasingly indicates that the above truisms fail to capture the full complexity of accessibility phenomena in human judgment. In fact, we cannot predict how accessible information influences a judgment without taking additional variables into account. This chapter addresses these complexities.

We begin with a discussion of recall based judgments. According to Proposition 1, we should be able to predict an individual's judgment solely by knowing what comes to mind. This, however, is not the case. First, the inferences that individuals draw from accessible content are qualified by subjective accessibility experiences that accompany the recall process (for reviews see Schwarz, 1998, and the contributions in Bless & Forgas, 2000). In general, individuals' conclusions are consistent with the implications of recalled content when recall is experienced as easy, but opposite to the implications of recalled content when recall is experienced as difficult. This contingency is eliminated when the informational value of the subjective accessibility experience is called into question. Moreover, it can be overridden by high processing motivation. We address the interplay of accessible content, accessibility experiences, and processing motivation in the first section. As will become apparent, our conceptualization of the informational value of accessibility experiences parallels the conceptualization of affect-as-information, initially introduced by Wyer and Carlston (1979), who were among the first to draw attention to the role of experiential information in social cognition (for a review see Schwarz & Clore, 1996).

Second, when individuals draw on accessible content, its specific impact depends on how it is used. Merely knowing that X is highly accessible is not sufficient to predict how X will

influence the judgment at hand. Instead, we need to know if X is used in constructing a mental representation of the object of judgment or a representation of the standard against which the object is evaluated. The former use results in assimilation effects, but the latter in contrast effects (Schwarz & Bless, 1992a). This work into mental construal processes revisits topics of information organization and integration that figured prominently in Wyer's (1974) *Information Organization and Change: An Information Processing Approach*. We address these diverging influences of the same accessible content in the second section.

Subsequently, we turn to a discussion of individuals' responses to new information. As is the case for recall based judgments, trait priming procedures inherently confound what comes to mind with the ease with which it comes to mind. We discuss possible implications of this confound and offer some conjectures that qualify Proposition 2. Going beyond the encoding principle of Proposition 2, a related body of research indicates that the influence of highly accessible concepts is not limited to the semantic interpretation of ambiguous information. Instead, highly accessible concepts also influence the fluency with which new information can be processed. Fluency itself is hedonically marked and high fluency results in more positive evaluations, which are not mediated by semantic processes (Winkielman, Schwarz, Reber, & Fazendeiro, in press), further highlighting the role of experiential information (Wyer & Carlston, 1979). We address these non-semantic influences of concept accessibility in the third and fourth section.

Finally, Proposition 3 holds that accessible information influences behavior through its influence on the interpretation of the situation. Although this possibility has received ample support (see Higgins, 1996; Wyer & Srull, 1989), recent research suggests that accessible concepts may also influence behavior through direct links between the mental representation of conceptual knowledge and behavioral responses (Dijksterhuis & Bargh, 2001). We comment on this possibility in the final section and conclude with a discussion of open issues.

Accessible Content and Accessibility Experiences:

Beyond "What" Comes to Mind

Numerous studies are consistent with the assumption that judgments depend on the subset of potentially relevant information that is most accessible at the time (for reviews see Bodenhausen

& Wyer, 1987; Higgins, 1996; Wyer & Srull, 1989). For example, Strack, Martin, and Schwarz (1988) asked students to report on their dating frequency as well as their general life-satisfaction. When the satisfaction question preceded the dating frequency question, the two questions were uncorrelated, $r = -.12$. But when the dating question preceded the life-satisfaction question, the correlation jumped to $r = +.66$, presumably because the dating question rendered dating related information highly accessible in memory. What has often been overlooked in studies of this type is that the priming manipulation (in this case, the preceding question) does not only influence what comes to mind, but also affects how easily it comes to mind. That is, priming manipulations inherently confound the increased accessibility of the primed content with the subjective accessibility experience of ease. When both components are separated, the emerging picture is more complex than Proposition 1 suggests.

If judgments were solely based on what comes to mind, we should observe, for example, that a task that renders many of an individual's own assertive behaviors accessible in memory results in judgments of higher assertiveness than a task that renders only a few assertive behaviors accessible. Empirically, this is not necessarily the case. Schwarz et al. (1991, Experiment 1) asked participants to recall either 6 or 12 examples of their own assertive or unassertive behavior. Subsequently, participants rated their own assertiveness. As predicted by the proposition that judgments depend on accessible content, participants rated themselves as more assertive after recalling 6 examples of assertive behavior than after recalling 6 examples of unassertive behavior (see Table 1). In contrast to this proposition, however, increasing the number of recalled examples reversed the observed pattern: Participants who successfully recalled 12 examples of assertive behavior rated themselves as less assertive than participants who recalled 12 examples of unassertive behavior. Moreover, those who recalled 12 assertive (unassertive, respectively) behaviors rated themselves as less (more, respectively) assertive than those who recalled only 6 examples.

Table 1

To reconcile these observations with Proposition 1, one may assume that the quality of the recalled examples decreased over the course of the recall task, leaving participants in the 12-examples conditions with a poorer set of accessible examples. Content analyses indicated,

however, that this was not the case. Instead, the observed reversal reflected participants' experience that it was easy to recall 6 examples, but difficult to recall 12. This difficulty, in turn, presumably suggested to participants that they can't be so (un)assertive after all, or else it wouldn't be so difficult to come up with 12 examples. Supporting this interpretation, the impact of participants' subjective accessibility experience was eliminated when they were led to attribute the experience to the influence of background music played to them (Schwarz et al., 1991, Experiment 3), reversing the otherwise obtained pattern. In this case, they drew on the recalled content and reported higher (lower, respectively) assertiveness the more examples of assertive (unassertive, respectively) behaviors they had recalled.

Further highlighting the role of subjective accessibility experiences, Wänke, Bless, and Biller (1996) controlled for accessible content by asking some participants to generate a few or many examples and subsequently presented these examples to other, yoked participants. As expected, participants who actively generated examples drew on their accessibility experiences and were more influenced when the task requested few rather than many examples. In contrast, yoked participants, who merely read the examples generated by others, were more influenced the more examples they read.

Finally, Stepper and Strack (1993, Experiment 2) manipulated subjective accessibility experiences independent of the amount of recall. They asked all participants to recall 6 examples of assertive or unassertive behavior, thus holding actual recall demands constant. To manipulate the subjective recall experiences, they induced participants to contract either their corrugator muscle or their zygomaticus muscle during the recall task. Contraction of the corrugator muscle produces a furrowed brow, an expression commonly associated with a feeling of effort. Contraction of the zygomaticus muscle produces a light smile, an expression commonly associated with a feeling of ease. As expected, participants who recalled 6 examples of assertive behavior while adopting a light smile judged themselves as more assertive than participants who adopted a furrowed brow. Conversely, participants who recalled 6 examples of unassertive behavior while adopting a light smile judged themselves as less assertive than participants who adopted a furrowed brow.

In combination, these studies demonstrate that subjective accessibility experiences are

informative in their own right. Moreover, their operation parallels the operation of other sources of experiential information, like individuals' mood at the time of judgment (Schwarz & Clore, 1983; Wyer & Carlston, 1979), and individuals do not draw on their accessibility experiences when their informational value is called into question.

Similar interaction effects of accessible content and subjective accessibility experiences have been observed across many content domains, ranging from judgments of risk (e.g., Raghurir & Menon, 1998; Rothman & Schwarz, 1998) and attitude strength (e.g., Haddock, Rothman, Reber, & Schwarz, 1999; Haddock, Rothman, & Schwarz, 1996) to evaluations of consumer products (e.g., Wänke, Bohner & Jurkowitsch, 1997), assessments of one's own memory (e.g., Winkielman, Schwarz, & Belli, 1998) and estimates of frequency (e.g., Aarts & Dijksterhuis, 1999; Wänke, Schwarz, & Bless, 1995) and probability (e.g., Sanna, Schwarz, & Stocker, *in press*). Throughout, these studies illustrate that any recall task provides two distinct sources of information: the content that is recalled and the subjective experience of the ease or difficulty with which it can be brought to mind. Which conclusions people draw from their accessibility experiences depends on their beliefs about memory (see Skurnik, Schwarz, & Winkielman, 2000, for a discussion).

Meta-Memory Beliefs

One meta-memory belief, which is at the heart of Tversky and Kahneman's (1973) availability heuristic, correctly holds that it is easier to recall examples of events that are frequent rather than rare in the world. Accordingly, individuals infer from ease of recall or generation that there are many relevant examples "out there," and that the recalled ones are relatively typical. Conversely, they infer from difficulty of recall or generation that relevant examples are infrequent and atypical. This results in judgments that are consistent with the implications of the content of the recalled examples when recall is easy, but opposite to the implications of recalled content when recall is difficult (for reviews see Schwarz, 1998; Schwarz & Vaughn, *in press*).

Another meta-memory belief correctly holds that it is easy to recall examples from categories that are well rather than poorly represented in memory. Accordingly, individuals use the ease or difficulty of recall to infer how much information about a category is stored in memory. For example, Winkielman, Schwarz, and Belli (1998) observed that participants who

had to recall twelve childhood events subsequently rated their childhood memory as poorer than participants who had to recall only four events, despite the fact that they had just recalled three times as many events.

Importantly, these meta-memory beliefs can give rise to second-order inferences when an appropriate subjective theory is applied. For example, Winkielman and Schwarz (2001) suggested to some participants that unpleasant events might be poorly represented in memory because we avoid thinking about the "bad stuff", making it difficult to recall details of unpleasant periods of one's life. In contrast, they suggested to other participants that pleasant events might be poorly represented because we don't ruminate about the "good stuff," making it difficult to recall details of pleasant periods of one's life. As predicted, participants who had to recall 12 events, a difficult task, evaluated their childhood as less happy when the accessible meta-memory belief entailed that negative life-periods are difficult to remember than when it entailed that positive life-periods are difficult to remember. Similarly, Haddock et al. (1999) observed that participants who had to generate only a few arguments in favor of an attitude position held this position with greater confidence than participants who had to generate many positions, presumably because ease of generation suggested that there are many supportive arguments "out there."

Finally, Wänke and Bless (2000) suggested that recipients of a persuasive message may assume that plausible and compelling arguments are easier to remember than specious ones. Consistent with this conjecture, they observed that the same argument was more influential the more contextual cues facilitated its recall, thus inducing an experience of ease. We return to their study below, in our discussion of processing motivation.

Undermining the Informational Value of Accessibility Experiences

None of the discussed influences of accessibility experiences can be observed when the informational value of the experience is called into question. Variables that undermine the informational value of accessibility experiences include external factors that may influence recall or generation (e.g., Haddock et al., 1999; Schwarz et al., 1991) and attribution of the experience to task characteristics ("anybody would find this difficult," e.g., Winkielman et al.,

1998). Moreover, individuals are unlikely to draw on experienced difficulty of recall when they assume that they are not particularly knowledgeable in the respective content domain (e.g., Sanna & Schwarz, 2001). Not being able to name famous Spanish matadors, for example, doesn't imply there aren't any; it only implies one doesn't know them. Reliance on accessibility experiences therefor requires the tacit assumption that one is knowledgeable in the content domain. In apparent contrast to this generalization, Ofir (2000) observed, however, that participants with low knowledge were likely to rely on their accessibility experiences, whereas participants with high knowledge were likely to draw on accessible content. This finding may either reflect that the low-knowledge participants were unaware of their lack of expertise or that the high-knowledge participants were not only more knowledgeable, but also more motivated to engage in systematic processing, an issue to which we return below.

Processing Motivation

Complicating things further, individuals' reliance on accessible content vs. accessibility experiences depends on the processing motivation they bring to the task. In most cases, judges are likely to rely on their accessibility experiences as a source of information when processing motivation is low, but turn to accessible content when processing motivation is high, even when this content was difficult to recall. This observation is consistent with the assumption that reliance on accessibility experiences is part of a heuristic processing strategy, whereas reliance on accessible content is part of a systematic processing strategy (Schwarz, 1998).

Rothman and Schwarz (1998; for a conceptual replication see Grayson & Schwarz, 1999) asked male participants to recall either a few or many behaviors that increase or decrease their risk for heart disease. To manipulate processing motivation, participants were first asked to report on their family history of heart disease. Presumably, this recall task has higher personal relevance for those with a family history of heart disease than for those without, once this history is rendered salient. As shown in Table 2, men with a family history of heart disease drew on the relevant behavioral information they recalled. They reported higher vulnerability after recalling 8 rather than 3 risk-increasing behaviors, and lower vulnerability after recalling 8 rather than 3 risk-decreasing behaviors. In contrast, men without a family history of heart disease drew on their accessibility experiences, resulting in the opposite pattern. They

reported lower vulnerability after recalling 8 (difficult) rather than 3 (easy) risk-increasing behaviors, and higher vulnerability after recalling 8 rather than 3 risk-decreasing behaviors.

Table 2

In addition, participants' perceived need for behavior change paralleled their vulnerability judgments, as shown in the bottom panel of Table 2. Note that participants with a family history of heart disease reported the highest need for behavior change after recalling 8 risk-increasing behaviors, whereas participants without a family history report the lowest need for behavior change under this condition, again illustrating a reversal in the judgmental outcome. In combination, these findings (and their conceptual replication; Grayson & Schwarz, 1999) suggest that individuals are likely to draw on their subjective accessibility experiences under low processing motivation, but on accessible content under high processing motivation.

While this generalization is likely to hold for recall and generation tasks of the type discussed above, Wänke and Bless (2000) reported an interesting exception. As already noted, they assumed that individuals may hold the belief that it is easier to remember plausible and compelling arguments rather than specious ones. If so, they may consider a given argument more compelling when they find it easier to recall. To manipulate participants' accessibility experience, Wänke and Bless provided participants with retrieval cues that made it either easy or difficult to recall a given argument from a previously presented message. As expected, participants were more persuaded by the same argument when this manipulation facilitated its recall. Consistent with the general observation that argument quality is more likely to influence attitude judgments under high processing motivation (for a review see Eagly & Chaiken, 1993), this effect was more pronounced under high than under low processing motivation. As this example illustrates, the impact of processing motivation is likely to depend on the meta-memory belief that is brought to bear on the accessibility experience in the first place, adding an additional level of complexity to the interplay of accessible content, accessibility experiences and processing motivation.

Conclusions

In combination, the reviewed research highlights that we cannot predict judgmental outcomes by merely knowing what comes to mind, in contrast to Proposition 1. Instead, we

need to consider the accessible content, the accessibility experience and its perceived diagnosticity, as well as the person's processing motivation. When processing motivation is high, judgments are indeed based on accessible content, as predicted by Proposition 1, even when this content was difficult to bring to mind. When processing motivation is low, however, judgments are only consistent with accessible content when recall is easy, but not when recall is difficult. This contingency is eliminated when the informational value of the accessibility experience is called into question, in which case judges draw on the only diagnostic source of information left, namely accessible content. Different meta-memory beliefs may add additional complexity to these contingencies for some tasks, as the results of Wänke and Bless (2000) illustrate.

While the above effects are reliably replicable (see Schwarz, 1998, for a review), we know little about how these contingencies play out under natural conditions. In fact, we surmise that Proposition 1 holds up very well under most natural conditions. Despite the fact that Proposition 1 does not capture the complexity of the underlying processes, its predictions will more often be right than wrong -- although sometimes for the wrong reasons.

First, suppose that a person approaches the task with high processing motivation. In this case, the person is likely to rely on a systematic processing strategy that draws on accessible content rather than accessibility experiences (e.g., Grayson & Schwarz, 1999; Rothman & Schwarz, 1998). Accordingly, her judgments will be consistent with recalled content, as predicted by Proposition 1.

Second, suppose that a person approaches the judgment task with low processing motivation. In this case, we may expect that the person draws on her accessibility experiences instead of accessible content. But given that information search is truncated early under conditions of low processing motivation, the person is unlikely to encounter any recall difficulties to begin with. If so, the most likely accessibility experience is one of ease. Drawing on this experience, the person will arrive at a judgment that is consistent with the implications of recalled content, again in line with the predictions of Proposition 1.

Third, recall will only be experienced as difficult under the limited information search that characterizes low processing motivation when the person's knowledge in the content domain is

extremely limited. In this case, the person's judgments are likely to be opposite to the implications of recalled content, in contrast to the predictions of Proposition 1.

Finally, if the person is aware of her limited expertise, she may correctly attribute the experienced difficulty to her own lack of knowledge. This attribution, in turn, would undermine the informational value of the experienced difficulty for the task at hand (as shown by Sanna & Schwarz, 2001). Hence, the person would draw on recalled content despite the fact that it was difficult to bring to mind, as observed under (mis)attribution conditions (e.g., Sanna & Schwarz, 2001; Schwarz et al., 1991).

As these conjectures indicate, the predictions of Proposition 1 would only be violated when recall is experienced as difficult despite a limited recall effort and this difficulty is not attributed to one's own lack of knowledge. As a result, the predictions of Proposition 1 provide a good approximation under most natural conditions, although not always for the right reason. Next, we turn to another set of complications, namely complications that arise from the use of accessible content.

Information Accessibility and Use:

Mental Construal Processes

How a given piece of accessible information influences a judgment depends on how it is used. Evaluative judgments that are based on features of the target (rather than on the perceiver's affective response; see Schwarz & Clore, 1996) require two mental representations, namely a representation of the target and a representation of a standard against which the target is evaluated (Schwarz & Bless, 1992a). Both representations are formed on the spot, drawing on information that is chronically or temporarily accessible. Information that is used in forming a representation of the target results in assimilation effects; that is, the inclusion of positive (negative) information results in a more positive (negative) judgment. Conversely, information that is used in forming a representation results in a contrast effect; that is, more positive (negative) information results in a more positive (negative) standard, against which the target is evaluated less (more) favorably. Hence, the same piece of accessible information can have opposite effects, depending on how it is used. The variables that influence information use can

be organized by assuming that perceivers tacitly ask themselves three questions, which serve as filters that channel information use.

Why Does It Come to Mind?

The first filter is: "Am I only thinking of this information because it was brought to mind due to some irrelevant influence?" If so, the accessible information is not used in forming a representation of the target. Accordingly, awareness of the priming episode, for example, undermines use of the primed information, resulting in contrast effects (e.g., Lombardi, Higgins, & Bargh, 1987; Martin, 1986; Strack et al., 1993).

Does it Bear on the Target?

When the information passes this first test, the second filter is: "Does this information represent a feature of the target?" This decision is driven by the numerous variables known to influence the categorization of information, including the information's extremity and typicality, as well as the presentation format and related context variables (for reviews see Schwarz & Bless, 1992a; Martin, Strack, & Stapel, 2001).

Although these variables are crucial under natural conditions, they are ambiguous with regard to the role of categorization processes per se. For example, the observation that a typical and an atypical exemplar have differential effects on the evaluation of a group may reflect that (a) the typical exemplar is included in the representation of the group, whereas the atypical exemplar is not, (b) that the two exemplars differ in the information they bring to mind, or (c) both. To isolate the role of categorization processes per se, we therefore need to rely on manipulations that elicit different categorizations of the same information, as a few examples may illustrate.

In a political judgment study, Bless and Schwarz (1999) took advantage of the ambiguous category membership of highly popular Richard von Weizsäcker, who, at the time, was President of the Federal Republic of Germany. On the one hand, the President is a politician, on the other hand, his office as a formal figure head (similar to the Queen in the United Kingdom) commits him to refrain from party politics. This allowed us to ask some respondents if they happened to know of which party Richard von Weizsäcker was a member, but to ask other respondents if they happened to know which office prevents him from participating in

party politics. Evaluations of his party served as the dependent variable. Relative to a condition in which Richard von Weizsäcker was never mentioned, participants evaluated his party more positively when the party membership question elicited his inclusion in the representation formed of his party. Conversely, they evaluated his party more negatively when the presidency question elicited his exclusion from this representation (see also Stapel & Schwarz, 1998).

Similarly, Bless and Wänke (2000) presented all participants with the same list of moderately typical television shows and asked them to select 2 shows they considered either (a) typically favorable, (b) atypically favorable, (c) typically unfavorable or (d) atypically unfavorable. Because all shows were similarly typical, participants' actual selection was driven by their favorability. Nevertheless, the typicality component of the categorization task influenced participants' overall evaluation of television programs in general, relative to a control condition (see Table 3). After selecting two favorably evaluated shows, they evaluated television programs in general more positively when the selection task entailed that they are typical rather than atypical. Conversely, after selecting two unfavorably evaluated shows, they evaluated television programs in general more negatively when the selection task entailed that they are typical rather than atypical. Thus, the same exemplars (television shows) elicited assimilation or contrast effects on judgments of a superordinate category, depending on their categorization.

Table 3

Extending this theme to issues of stereotype change, Bless, Schwarz, Bodenhausen, and Thiel (2001) provided all participants with the same description of a target person, whose features were partly consistent and partly inconsistent with the stereotype about a group. After participants read the description, they answered different knowledge questions that did or did not invite the inclusion of the exemplar in the representation formed of the group. As shown in Table 4, inclusion of the (somewhat) atypical exemplar in the representation formed of the group elicited less stereotypical judgments of the group, indicating stereotype change. Yet the desired stereotype change observed in judgments of the group came at a price for the atypical exemplar, who was now evaluated in more stereotypical terms. Conversely, excluding the exemplar from the representation of the group elicited less stereotypical judgments of the exemplar. Yet this beneficial effect for the exemplar came at a price for the group, which was

now evaluated in more stereotypical terms. In short, inclusion resulted in assimilation effects, and exclusion in contrast effects, on judgments of the exemplar as well as the group.

Table 4

On the theoretical side, these findings again highlight that the same information can affect judgments in opposite ways, depending on how it is used. On the applied side, these findings suggest that stereotype change involves an unfortunate tradeoff between the group and its individuated members, where beneficial changes for one come at a price for the other.

Finally, one of the most reliable determinants of assimilation and contrast is the categorical relationship between the primed information and the target itself. Suppose, for example, that a preceding question brings Richard Nixon to mind and participants are asked to judge the trustworthiness of "American politicians." Nixon is a member of the superordinate target category "American politicians," resulting in an assimilation effect in the form of lower trustworthiness. Yet, ratings of other exemplars from this category (e.g., Newt Gingrich) show contrast effects, reflecting that lateral categories are mutually exclusive (e.g., Schwarz & Bless, 1992b; Stapel & Schwarz, 1998; Wänke, Bless, & Igou, 2001). This divergent effect of primed information on superordinate and lateral targets is at the heart of many asymmetries in public opinion, e.g., the observation that Americans distrust Congress but trust their own representative.

Conversational Norms

The third and final filter pertains to the norms of conversational conduct that govern information use in conversations: "Is it conversationally appropriate to use this information?" Conversational norms prohibit redundancy and invite speakers to provide information that is new to the recipient, rather than information that the recipient already has (for a review see Schwarz, 1994;1996). Hence, highly accessible information is not used when it violates this conversational norm, again resulting in contrast effects (e.g., Schwarz, Strack, & Mai, 1991; Strack, Martin, & Schwarz, 1988).

Information that passes all three tests is included in the representation formed of the target and results in assimilation effects. Information that fails any one of these tests is excluded

from the representation formed of the target, but may be used in forming a representation of the standard, resulting in contrast effects.

The Size of Assimilation and Contrast Effects

Theoretically, the impact of a given piece of information should decrease with the amount and extremity of other information used in forming the respective representation (see Wyer, 1974). Supporting this set size principle, we observed attenuated assimilation as well as attenuated contrast effects the more other information is temporarily (e.g., Bless, Igou, Schwarz, & Wänke, 2000) or chronically (e.g. Wänke, Bless, & Schwarz, 1998) accessible and used in forming a representation of the target or of the standard, respectively.

Conclusions

As this selective review of mental construal processes indicates, Proposition 1 fails to capture the complexity of the processes underlying recall based judgments. Even when people draw on accessible content rather than their accessibility experiences, we can not predict the impact of a given piece of accessible information without taking its use into account. The same information can elicit assimilation as well as contrast effect, depending on whether it is used in forming a representation of the target or a representation of the standard, against which the target is evaluated.

Subjective accessibility experiences are likely to add further complexity to the construal process. Theoretically, we may expect that information that is difficult to bring to mind seems less typical for the target category (see Tversky & Kahneman, 1973) and is hence less likely to be included in the representation formed of the target. The findings reviewed in the section on accessibility experiences are compatible with this conjecture but do not allow us to separate the effects of perceived frequency ("How many exemplars are out there?") and perceived typicality ("How typical are the ones I retrieved?"). This issue awaits further research.

Concept Priming and Accessibility Experiences

We now turn to a discussion of Proposition 2. This proposition holds that ambiguous information is interpreted in terms of the most accessible applicable concept. "When two or more concepts are potentially applicable for interpreting a behavior, the first concept that is identified (?) is the one that is typically used" (Wyer & Srull, 1989, p. 117). Hence, readers

interpret a sentence like, "Donald was well aware of his ability to do many things well" (taken from Higgins et al., 1977), either as indicating that Donald is "confident" or that he is "conceited," depending on which of these concepts was primed. We surmise that such encoding effects not only require that the respective concept comes to mind, but that it does so easily -- which is virtually guaranteed by the priming manipulation. Although a direct test is not available, several observations are consistent with this conjecture.

Using a scrambled sentence task, Srull and Wyer (1979) observed that encoding effects "increased with the number of trait-relevant priming items" and "decreased with the time interval between the performance of the priming task and presentation of the stimulus information" (Wyer & Srull, 1989, p. 121). They interpreted these findings in the context of their bin model of memory. According to this model, "the more often a trait concept is primed, the more copies of it should be made and redeposited on top of the semantic bin;" conversely, the longer the time interval, the more likely it is that other applicable concepts are "activated in the interim, and copies of these concepts are redeposited in the semantic bin on top of the explicitly primed concept" (Wyer & Srull, 1989, p. 120). Hence, frequency of priming increases, and length of time interval decreases, the likelihood that the primed concept is retrieved later on.

This interpretation has two important implications. First, it assumes that the observed differences are solely due to differential likelihood of concept retrieval. That is, a larger number of participants is assumed to retrieve and apply the primed concept under conditions of frequent priming and short delays. Second, it locates the observed differences between, rather than within, participants: Once the concept is retrieved and applied, the judgment is the same, independent of frequency of priming and time interval. Relevant is solely if the concept is retrieved at the time of encoding. If true, this process should result in differential variance within the experimental conditions: The larger the proportion of participants who retrieve the concept, the smaller the variance in the respective condition of the experiment. Empirically, this was apparently not the case (see Srull & Wyer, 1979).

Alternatively, we may locate the observed differences within participants by assuming that time interval and frequency of priming influence the ease with which the primed concept comes to mind. From this perspective, participants interpret any thoughts that happen to come

to mind while reading the target description as their response to the target (see Clore, 1992; Schwarz et al., 1991, for a discussion). The faster the respective trait concept "pops to mind," the more indicative it seems, resulting in a more extreme trait judgment. This process would result in the patterns observed by Srull and Wyer (1979), without entailing a prediction of differential variance within the respective experimental conditions. Of course, the viability of this ex post interpretation is an open issue. Nevertheless, several findings are compatible with the theoretical assumptions.

If encoding effects of concept priming are based on a metacognitive process by which individuals use their own apparent reactions to the target as input into the judgment, we should observe that priming effects are not obtained when perceivers are aware that the concept may come to mind for "the wrong reason" (see Clore, 1992; Schwarz & Bless, 1992a; Schwarz & Clore, 1996, for related discussions). Empirically, this is the case and primed concepts are not applied when perceivers are aware of a potential influence of the primes (e.g., Lombardi, Higgins, & Bargh, 1987; Strack et al., 1993). In this case, perceivers discount the primed concept and turn to other applicable concepts instead, often resulting in a contrast effect.

These conjectures suggest that accessibility experiences may contribute to the encoding effects predicted by Proposition 2. As in the case of recall based judgments, priming procedures inherently confound accessible content and subjective accessibility experiences. Unfortunately, the empirical exploration of this issue is hampered by a lack of suitable experimental procedures that go beyond the manipulation of participants' awareness of the priming episode, discussed above. Hence, a core theoretical issue of social cognition research awaits experimental ingenuity: Is the mere accessibility of a trait concept sufficient for the commonly observed encoding effects or does the application of the accessible concept require the subjective experience of ease, which is virtually guaranteed by the manipulations we use in priming experiments?

Concept Accessibility and Processing Fluency:

Non-semantic Effects of Priming

Independent of the role of the open issues addressed above, all researchers agree that concept priming influences subsequent evaluative judgments through differential semantic interpretation of

ambiguous input information. This assumption is well supported by the available evidence (for reviews see Higgins, 1996; Wyer & Srull, 1989). Recent findings suggest, however, that concept priming may also influence evaluative judgment in ways that are not mediated by differential semantic interpretation of the input. We now turn to this research.

As a growing body of work into perceptual fluency indicates, a given object is evaluated more positively, the more easily it can be perceived (for a review see Winkielman, Schwarz, Reber, & Fazendeiro, in press). Hence, any variable that facilitates fluent perception is likely to increase liking, from figure-ground contrast (e.g., Reber, Winkielman, & Schwarz, 1998) and presentation time (Reber et al., 1998) to previous exposure (as known since Zajonc's, 1968, demonstration of the mere exposure effect). Extending this theme, Reber et al (1998) observed that participants liked a given picture more when it was preceded by a subliminally presented matching, rather than mismatching, contour. In none of these cases can the difference in evaluative judgment be traced to differences in the semantic interpretation of the targets. Instead, the available evidence suggests that fluency is hedonically marked and itself experienced as positive (Winkielman, et al., in press).

Consistent with this hedonic marking assumption, the influence of fluency is not limited to explicit judgments, but can also be captured with psychophysiological measures. Specifically, Winkielman and Cacioppo (in press) observed that high fluency is associated with increased activity over the region of the zygomaticus major ("smiling muscle"), which is indicative of a positive affective response.

These observations suggest the possibility that concept priming may influence judgment in ways that are not mediated by semantic interpretation. To the extent that concept priming facilitates fluent processing of subsequent associatively related stimuli, it may increase liking of these stimuli even under conditions where differential interpretations of the stimuli are unlikely. Winkielman and Fazendeiro (2001) explored this possibility in a cross-modal priming task. Specifically, they showed participants a series of unambiguous pictures of common objects and animals. Each picture was preceded by a letter string consisting either of a word or a non-word. Participants first indicated, as fast as possible, if the letter string was an actual English word. Subsequently, they reported their liking for the picture. The letter strings served as the

fluency manipulation. Some pictures were preceded by matched words (e.g., word "dog" - picture "dog"), introducing the highest level of fluency. Other pictures were preceded by associatively related words (e.g., word "key" - picture "lock"), introducing a medium level of fluency. Yet other pictures were preceded by an unrelated word (e.g., word "snow" - picture "desk"), introducing the lowest level of fluency. The results showed a robust effect of concept priming on participants' evaluation of the target pictures. As expected, pictures preceded by matching words were liked significantly more than pictures preceded by related words, which, in turn, were liked significantly more than pictures preceded by unrelated words. Follow-up studies showed that these fluency effects do not require that the concept primes immediately precede the target pictures. Instead, the same pattern of effects was obtained when participants studied a list of concept primes before they were exposed to the pictures.

In combination, the Winkielman and Fazendeiro (2001) findings indicate that the influence of concept priming is not limited to the interpretation of ambiguous information. All of the pictures presented were unambiguous and it is hard to see how exposure to the prime "key" would influence the semantic interpretation of an unambiguous picture of a "lock." But the concepts "key" and "lock" are closely associated in semantic memory and priming "key" temporarily facilitates the processing of a picture that presents a "lock." This increased processing fluency is itself hedonically marked, resulting in more positive evaluations as well as more positive psychophysiological responses. Accordingly, fluency effects provide a further illustration of how priming procedures can influence evaluative judgment through individuals' reliance on experiential rather than semantic information, as already observed in our discussion of accessibility experiences.

Concept-Behavior Links

Much as the Winkielman and Fazendeiro (2001) studies suggest that priming effects on evaluative judgment are not necessarily mediated by differential interpretations of information about the target, priming effects on behavior are not necessarily mediated by differential interpretations of the behavioral situation. Although primed information can undoubtedly influence behavior through differential construal of the situation (for an early demonstration see Schwarz & Strack, 1981), a growing body of research suggests a more direct link.

For example, Bargh, Chen and Burrows (1996) observed that priming the elderly stereotype with words like "Florida" or "bingo" induced participants to walk more slowly to the elevator after completion of the experiment. Similarly, Dijksterhuis and van Knippenberg (1998) found that priming the professor stereotype increased, and priming the soccer hooligan stereotype decreased, individuals' performance on knowledge tests. The authors attribute these findings to a direct perception-behavior link (for reviews see Bargh, 1997; Bargh & Chartrand, 1999; Dijksterhuis & Bargh, 2001). Consistent with this suggestions, neuropsychological research indicates that the same neurons are involved in perceiving an action and executing it (for a review see Rizzolatti & Arbib, 1998). Similarly, semantic processing of action verbs is associated with increased brain activity in regions corresponding to the execution of the respective action (e.g., Pulvermüller, Härle, & Hummel, 2001). If so, semantic and perceptual processing may increase the activation of representations that are directly involved in acting, thus facilitating behavioral responses that are not mediated by differential interpretations of the meaning of the situation (for an extended discussion see Dijksterhuis & Bargh, 2001).

In addition, a growing body of research shows that goals, like other mental representations, can be automatically activated by features of the environment, initiating processes of goal pursuit that parallel deliberate goal enactment (for reviews see Bargh & Gollwitzer, 1994; Gollwitzer & Moskowitz, 1996). These automatic processes can be intentionally employed to facilitate goal attainment: By forming an implementation intention that links critical situations with goal-directed responses, individuals may delegate the initiation of goal directed behavior to anticipated situational cues. This strategy can overcome limitations of prospective memory (e.g., Chasteen, Park, & Schwarz, 2001) and has been found to reliably facilitate goal directed behavior (for a review see Gollwitzer, 1999).

In combination, these lines of research demonstrate that highly accessible information can influence behavior in ways that do not reflect differential interpretations of the situation, in contrast to the commonly accepted Proposition 3.

Conclusions

As this selective review indicates, the accessibility of information plays a crucial role in human judgment and behavior, much as early social cognition theorizing predicted. A quarter century

later, however, the accumulating evidence indicates that the underlying processes are more complex than has commonly been assumed. In retrospect, it becomes apparent that early social cognition theorizing overemphasized the role of semantic information at the expense of experiential information and paid insufficient attention to judges' active role in the use of a given piece of information (Schwarz, 2000). Notably, Bob Wyer has seen the potentially crucial role of these variables early on. For example, Wyer and Carlston (1979) suggested that affect may serve as a source of information in its own right. This conjecture was well supported by subsequent research (for reviews see Schwarz & Clore, 1996; Wyer, Clore, & Isbell, 1999) and has paved the way for the later exploration of other sources of experiential information, like accessibility (Schwarz, 1998) and fluency (Winkielman et al., in press) experiences. Similarly, our treatment of inclusion/exclusion processes (Schwarz & Bless, 1992a) owes much to Wyer's (1974) early discussion of information organization and integration and his later exploration of conversational aspects of human judgment, which highlighted the individual's active role in information use (Wyer & Gruenfeld, 1995). As the reviewed research demonstrates, we cannot understand the role of information accessibility in human judgment without taking these variables into account.

First, consistent with a growing interest in metacognitive processes in social and cognitive psychology, the reviewed work highlights that the phenomenal experiences that accompany the thought process can themselves serve as an important source of information. The experience that a given piece of semantic information comes to mind not only renders this semantic information available for further use, as assumed in Proposition 1. Instead, it also provides experiential information that qualifies the implications of the semantic information. The underlying processes are reasonably well understood for recall based judgments (Schwarz, 1998), but their implications for priming effects on the encoding of new information (Proposition 2) have hardly been addressed. Unfortunately, priming procedures necessarily confound changes in what comes to mind with how easily it comes to mind -- a priming procedure that leaves us searching for the primed concept is a procedure that didn't work. The observation that awareness of the priming episode undermines the otherwise observed encoding effects (e.g., Lombardi et al., 1987; Strack et al., 1993) parallels the observation that misattribution

manipulations undermine the impact of accessibility experiences on recall based judgments (e.g., Schwarz et al., 1991). We therefore conjecture that accessibility experiences play a crucial role in both phenomena, an issue that awaits further research.

Second, priming effects on the evaluation of new information are not necessarily mediated by differential semantic interpretations, in contrast to Proposition 2. Instead, highly accessible concepts can facilitate the fluent processing of new information. Fluency of processing, however, is itself hedonically marked and results in more favorable evaluations without changes in the semantic meaning of the stimulus (Winkielman et al., in press).

Third, even within a purely semantic framework, we cannot predict the outcome of a judgment by merely knowing what comes to mind, in contrast to Proposition 1. Instead, we need to consider how accessible information is used in forming mental representations of the target of judgment and of a standard (Schwarz & Bless, 1992a). Most important, the same accessible input can give rise to assimilation as well as contrast effects, depending on its use.

Finally, highly accessible information can influence behavior in ways that are not mediated by differential interpretations of the behavioral situation, in contrast to Proposition 3. This presumably reflects that the same mental representations are involved in perceiving and acting (Dijksterhuis & Bargh, 2001), resulting in activation effects that bypass the usually assumed interpretation stage.

In combination, these findings cast doubt on the viability of familiar truisms, which we all came to like. Hopefully, repeated exposure to the more complicated story will facilitate its fluent processing and easy recall in the future, lending it the ring of "truth" that the earlier propositions enjoyed -- until we need to revise the present story as well.

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Table 1
Self-reports of Assertiveness as a Function of Valence and
Number of Recalled Behaviors

Number of Recalled Examples	Type of Behavior	
	Assertive	Unassertive
Six	6.3	5.2
Twelve	5.2	6.2

Note. N is 9 or 10 per condition. Mean score of three questions is given; possible range is 1 to 10, with higher values reflecting higher assertiveness. Adapted from Schwarz, Bless, Strack, Klumpp, Rittenauer-Schatka, and Simons (1991, Experiment 1).

Table 2
Vulnerability to Heart Disease as a Function of Type and Number
of Recalled Behaviors, and Family History

	Type of Behavior	
	Risk-increasing	Risk-decreasing
Vulnerability Judgments		
With family history		
3 examples	4.6	5.8
8 examples	5.4	3.8
Without family history		
3 examples	3.9	3.1
8 examples	3.2	4.3
Need for Behavior Change		
With family history		
3 examples	3.6	5.2
8 examples	6.3	4.7
Without family history		
3 examples	3.4	3.0
8 examples	2.8	5.6

Note: N is 8 to 12 per condition. Judgments of vulnerability and the need to change current behavior were made on 9-point scales, with higher values indicating greater vulnerability and need to change, respectively. Adapted from Rothman and Schwarz (1998).

Table 3
Category Evaluations as a Function of Exemplar Valence and Exemplar Typicality

	Assigned Typicality		
	Typical	Atypical	Control group
Valence of exemplars			
favorable	4.6	3.5	--
unfavorable	3.3	4.6	--
Control group	--	--	4.1

Note. Evaluations ranged from 1 to 9, with higher scores indicating more positive evaluations.

Adapted from Bless and Wänke (2000).

Table 4
Stereotypic Evaluations as a Function of Target and Categorization

	Inclusion	Control	Exclusion
Judgmental target			
Group	3.67	3.84	4.83
Exemplar	2.64	2.33	1.78

Note. Higher scores reflect more stereotypic evaluations. Adapted from Bless, Schwarz, Bodenhausen, and Thiel (2001).