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Subjective reports and process dissociation: Fluency, knowing, and feeling

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Abstract

We review research on the fluency heuristic as a basis for the subjective experience of familiarity. Then, we explore the links between the construct of fluency and the automatic versus consciously controlled memory processes that are estimated using the process dissociation procedure, and the phenomenological experiences studied using “Remember” and “Know” judgements. Although the fluency that underlies familiarity may map onto the automatic memory process that is estimated by the process dissociation procedure, both fluency and automatic memory processes arise in a particular context and their expression depends on the joint constraints created by the cues and the task. © 1998 Elsevier Science B.V. All rights reserved.

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1. Introduction

Research on the use of a fluency heuristic as a basis for the subjective experience of memory has a long history and a short past, to paraphrase Ebbinghaus. An insight owed to the James–Lange view of emotion is that subjective experience can

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involve an attribution or unconscious inference about effects on performance and so follow from, rather than be responsible for, objective performance. In retrospect, it is surprising that this insight contributed to subjective experience and consciousness being “kicked-out” of psychology. Developments such as Munsterberg’s motor-theory of consciousness and Holt’s theory (as cited in Murphy and Kovach, 1972) that consciousness is equivalent to our sensorimotor responses to objects resulted in subjective experience being treated as epiphenomenal. Consequently, introspection by analogy (Romanes as cited in Murphy and Kovach, 1972) was replaced by a careful description of behavior. Psychologists stopped asking what rats were thinking and began instead to ask what rats were doing. Introspection and the emphasis on conscious experience fell from favor. Subsequently, it was the experimenter’s observations of behavior rather than the subject’s observations of experience that became the foundation for Psychology.

Sometimes the experimenter and the subject dramatically disagree. The experimenter examines behavior and notes evidence of memory for a prior event. The subject, in contrast, although showing the behavior denies any recollection of the earlier event. This, of course, describes the dissociation between performance on direct and indirect tests that has been so important for recent theorizing about memory (for reviews, see Kelley and Lindsay, 1996; Roediger and McDermott, 1993). Such dissociations have served to bring questions about subjective experience back to the forefront. The most striking characteristic of an amnesic is the lack of subjective experience of remembering even while objective performance clearly shows the use of memory.

Findings of dissociations highlight questions about subjective experience that were popular prior to the behaviorist revolution. Much of recent research questioning subjective experience of memory reflects an unknowing continuation of that earlier research (Brewer, 1992). Social psychologists were less swept up in the behaviorist revolution and continued to examine subjective experience, particularly feelings and emotion. The work by Schachter and Singer (1962) serves as an example. They showed that the general activation produced by epinephrine could be experienced as either anger or happiness, depending on the unconscious inference or attributions of the person as guided by the social environment. Similarly, the “self-perception” theory of Bem (1967) argued that attitudes arose from an interpretation of one’s behavior, analogous to the interpretation an outside observer might make. Nisbett and Wilson (1977) also proposed that people interpret their own performance in the same way they interpret the performance of others. People’s statements about why they fell asleep at night within a certain amount of time or why they took more electric shocks in an experiment than most people stem from inferences based on intuitive theories of human behavior.

Analogously, Jacoby and Dallas (1981) proposed that the subjective experience of familiarity may derive from people’s interpretation of variations in their performance. Specifically, people might interpret changes in their perceptual processing of words as indicative of prior experience and so have the subjective experience of familiarity. Jacoby and Dallas noted that participants in recognition experiments reported that old items on the test appeared to “jump out” at them from the page.

Tests of perceptual identification confirmed that prior study of words leads to a higher probability of identifying those words from a brief visual presentation. Jacoby and Dallas found that manipulations such as levels of processing, repetition, and same versus changed modality between study and test sometimes affected perceptual identification and recognition memory similarly, and sometimes produced dissociations. They interpreted these results as being consistent with a hypothesis that “perceptual fluency” could be one basis for recognition memory, but that other bases existed that relied more on elaborative processing (for correlational support, see Johnston et al., 1985).

Jacoby and Whitehouse (1989) attempted to manipulate perceptual fluency to see if it did form the basis for the subjective experience of familiarity. They found that showing a brief preview of a test word immediately prior to presenting the word in full view for a recognition memory judgment increased the likelihood that both old *and* new words would be judged “old”. It was critically important that the preview word be presented so briefly that participants were unaware of its presentation: when the preview word was presented for a longer duration, the following test word was *less* likely to be judged old. The unconscious interpretation that fluent perceptual processing of the test item was due to studying the word earlier was disrupted when the fluency could be readily attributed to having just read the word. Similarly, manipulations of visual clarity at test can produce an experience of “oldness” but not when people know clarity is being manipulated (Whittlesea et al., 1990). Just as perceptual illusions can be used to investigate the cues that give rise to perceptual experiences such as depth and distance, the study of memory illusions can reveal the cues that form the bases for memorial experiences.

Fluency is not simply changes in the processing of perceptual cues, but changes in conceptual processing as well. For example, Whittlesea (1993) manipulated conceptual fluency during a recognition test, by preceding items with a highly predictive sentence context (“The stormy seas rocked the BOAT”) or a less predictive context (“He saved up his money and bought a BOAT”). The predictive sentence context produced illusions of memory. In fact, manipulations of conceptual fluency produced substantially larger effects than did manipulations of perceptual fluency. Luo (1993) had participants perform a variety of tasks on words immediately prior to recognition memory judgments and found that each manipulation produced a large increase in the probability of judging the word old. Luo argued that the manipulations changed the familiarity of the target items, perhaps due to perceptual and conceptual fluency.

Inherent in the idea that the subjective experience of familiarity arises from an interpretation of cues is the notion that cues can be interpreted in a variety of ways. As noted above, if ease of identifying an item is obviously being manipulated by the experimenter, the resulting perceptual fluency does not give rise to a feeling of familiarity. Attributions are also affected by one’s goals. In the context of attempts to remember, people may be more likely to interpret ease of generating an item or perceiving it as familiarity. In the context of other tasks, the same cues may be interpreted in other ways (Jacoby et al., 1989).

2. Separating familiarity and recollection: The exclusion procedure

The familiarity created by reading items in a first phase of an experiment can be correctly attributed to its source, and so support correct recognition memory judgments, or it can be misattributed to other sources if people are oriented toward those other sources by a particular task. We took advantage of this propensity for familiarity to be misattributed to gain further evidence for two bases for recognition memory, conscious recollection of the details of the event versus familiarity (Jacoby et al., 1989). Participants read lists of names of nonfamous people in the first phase of an experiment under conditions of full or divided attention. Divided attention reduces elaboration and encoding of context, but nonetheless if participants read the names aloud, the names could become more familiar. In the second phase, participants were asked to judge whether names were famous or nonfamous. They were informed that all names presented in the first phase were nonfamous, and so if they recognized a name from the first phase, they would know to call it “nonfamous”. After studying the names with full attention, participants were less likely to call old nonfamous names “famous” than new nonfamous names, presumably because they could consciously recollect the presentation of some of those names in the first phase. However, after studying the names under conditions of divided attention, the reverse occurred – old nonfamous names were *more* likely to be judged famous than new nonfamous names. Divided attention prevented elaborative processing and so reduced the probability of recollection during the fame test. In the context of the fame test, familiarity due to prior presentation was interpreted as evidence that the names were famous, leading to numerous instances of false fame.

The procedure of placing two bases for judgment, such as familiarity and recollection, in opposition to each other allows one to uncover the existence of those two bases. However, it can lead one to underestimate the process of familiarity because of the offsetting effect of recollection. Reading “Sebastian Weisdorf” can produce an increment in familiarity later (perhaps by changing later perceptual processing of the name at test) even though it is subsequently judged nonfamous because of conscious recollection that it was read on the list. If we suppose that the processes underlying familiarity and the processes underlying conscious recollection are independent (cf. Jones, 1987), then the opposition or exclusion procedure only measures the familiarity that is unaccompanied by recollection. The desire to actually estimate familiarity and recollection motivated the process-dissociation procedure, to which we turn next.

3. The process-dissociation procedure

The process-dissociation procedure is a general approach to separately estimating the contributions of two processes to performance when only one process affords conscious control over responding. In the context of the fame experiments, familiarity does not specify its source: a name may be familiar because it is famous, or because it was presented on the study list. Therefore, familiarity cannot be used as a basis for recognition memory in the fame judgment exclusion test, because to do

so would lead participants to incorrectly reject many famous names as nonfamous. In contrast, conscious recollection of the details of seeing the name on the list does specify its source, and so can be a basis for controlled responding in this situation.

The process-dissociation procedure (Jacoby, 1991; Jacoby et al., 1993) defines conscious control as the difference in performance between conditions where one is trying to versus trying not to do something. In the exclusion procedure outlined above, one can try not to call a name famous when one can remember that it was presented in a list of nonfamous names. We can also arrange an inclusion test condition, where one tries to call a name famous when one can consciously recollect that it was on the study list (by telling participants that all the names were famous), or when it simply seems famous. If we assume that conscious recollection and the familiarity that can be misattributed to fame are independent, then calling an old item famous in the inclusion condition is either due to conscious recollection or familiarity, or both.

$P(\text{famous}) \text{ inclusion} = \text{Recollection} + \text{Familiarity, minus the overlap of the two processes, } RF, \text{ or } R + (1 - R) F.$

In the exclusion condition, an old name will be called famous if it fails to be recollected, but if it nonetheless has gained sufficient familiarity from prior study to pass the criterion the participant sets for the fame decision:

$P(\text{famous}) \text{ exclusion} = (1 - R) F.$

To obtain estimates of recollection, or R , one subtracts the probability of calling a name famous in the exclusion condition from the probability of calling a name famous in the inclusion condition. Once an estimate of R is obtained, the equations can be used to solve for an estimate of F . When one does so, it is clear that using an exclusion procedure alone in the false fame paradigm underestimates how much familiarity accrues when a name is studied (Jennings and Jacoby, 1993).

If it is true that two processes make independent contributions to a particular task, then one should be able to find manipulations that affect one estimate derived from the process-dissociation procedure without affecting the other estimate, or that affect the other estimate in an opposite direction. In the fame procedure, divided attention reduced conscious recollection, but did not affect familiarity. Such a dissociation provides support for the assumption that the two processes are independent.

The process-dissociation procedure has been used in a variety of memory paradigms to separate out processes that afford conscious control in the task from processes that do not afford conscious control, including paradigms using recall cued with stems of words, paired associate cued recall, and recognition (for a review, see Jacoby et al., 1997). In each of those cases, full versus divided attention disrupted the processing necessary for conscious recollection, but had no effect on the remaining component, the unconscious influence. Because divided attention does not influence the unconscious component in these memory tasks, Jacoby has often called that estimate A , for automatic. The minimal processing of reading the name or word aloud in these memory paradigms appears to be enough to produce an unconscious or automatic influence of memory. Similarly, a short deadline for retrieval reduces conscious recollection but does not affect the automatic memory component. Age is another variable that produces dissociations between conscious and automatic

memory in the process-dissociation procedure: The elderly show decrements in the conscious component but not the automatic component.

These patterns of dissociations produced by factors that are identified with cognitive control support the assumption of independence between conscious and automatic memory, an assumption that lies at the heart of the equations in the process dissociation procedure. However, the independence assumption has been the most controversial aspect of the procedure (Curran and Hintzman, 1995). There are indeed strategies participants can adopt during a memory test that would not be described by the independent operation of conscious and automatic memory processes. Specifically, if people adopt a strategy of using the cues to generate guesses followed by a recognition check of each generated item, their performance cannot be fit by the independence equations. One needs to instruct participants to attempt to directly retrieve studied items to be able to investigate recollection using the process dissociation procedure (Jacoby, 1998).

Specificity of automaticity: It is important to note that what is estimated by *A* in a stem completion process dissociation task will not necessarily be equivalent to the estimate of *A* in paired associate cued recall or to the estimate of *A* in a recognition task. Elements of the task – the goal or intention held by the subject as well as the cues presented – provide the context to support automatic memory processes. It is easy to appreciate that changing the cue from stems to words would differentially provide support for the emergence of automatic memory, just as it would differentially provide support for the emergence of conscious recollection. It is perhaps less appreciated how changing the subject's intentions or task involves a similar change of context.

This specificity of automatic memory follows from Neumann (1984), who argued against the idea that automaticity is an intrinsic, invariant property of processes and for the idea that automaticity is relative and context-dependent. He proposed that automaticity is a property of performance that emerges when skill at an action (procedures stored in memory) plus the stimulus in the situation are sufficient to specify all the parameters that control the action. The parameters jointly specified by the stimulus and the skill control the task without evoking the conscious awareness that accompanies the selection of parameters. Analogously, automatic memory as estimated by the process-dissociation procedure emerges from the joint operation of the external cue and internal representations of the task plus the "procedure" that has been modified by recent experience, e.g., by study of an item on the preceding list.

Specificity of conscious memory: Just as the automatic memory estimate is specific to the task in process dissociation, the conscious component is also specific to the task. Conscious recollection is defined as whatever can be used to control responses in the procedure. Therefore, the estimate of recollection, *R*, will not be the same in a two-list process-dissociation procedure (Jacoby, 1991) as it will be in a one-list procedure (Jacoby et al., 1993). Memory for any source-specifying detail can be used as a basis to include or exclude an item in a memory task. As in any paradigm, the experimenter who wants to use the process-dissociation procedure to study a consciously controlled and automatic process needs to take care in formulating the task so that the estimates do isolate what he or she wants to investigate (cf. Gruppuso et al., 1997).

4. Relation between fluency and automatic influences of memory

Does the estimate of *A* derived from the process-dissociation procedure represent fluency? Our discussion of the relativity of automaticity raises the caution that to answer that question one must consider “Automatic influences in what context”? Equally important is the question “Fluency in what context”? Just as automatic influences of memory depend on the constraints created by the cue and task, fluency arises in a particular context and will be affected by the joint constraints created by the cue and task. Fluency assessed in a perceptual identification test might be quite different from the fluency in a recognition memory test, because of the internal context created by the person’s goal and orientation. When people’s goal is to remember, they attempt to generate constraints as they address memory, by recreating the context of the episode. That will produce changes in how fluency will occur. Because of the specificity of fluency, a researcher studying fluency as a basis for the subjective experience of memory would ideally want to manipulate or measure fluency in the context of a recall or recognition task, rather than in a separate task such as perceptual identification (Johnston et al., 1991; Luo, 1993; Lindsay and Kelley, 1996; Whittlesea, 1993).

Fluency and automaticity ought to be equivalent if measured in the context of the same task. However, one might argue that using the process-dissociation procedure to estimate recollection and automatic influences of memory conflicts with the attributional approach to memory. After all, if a person detects changes in the fluency of processing an item on a memory test, why could not he or she correctly attribute it to the proper source, and have the subjective experience of remembering, and so exclude the item on the process dissociation test? In that case, fluency would increase the estimate of conscious memory rather than contribute to the estimate of automatic memory in the process-dissociation procedure. As noted above, in the process-dissociation procedure applied to fame judgments, participants can’t attribute all familiarity to having read the name on the list, because of the presence of (familiar) famous names. Therefore, familiarity contributes to the estimate of *A*.

Critics of the process-dissociation procedure (e.g., Graf and Komatsu, 1994) have argued that participants often fail to understand instructions for exclusion tests, as shown by the high probability of failures to exclude old words on an exclusion test. However, we believe that the participants actually do understand exclusion instructions, and the criticism reflects somewhat of a misunderstanding of the goal of the exclusion condition. The goal of exclusion instructions is *not* to encourage participants to reject all old words, using fluency as a basis for exclusion. There needs to be ambiguity about the source of fluency during the test to enable the process-dissociation procedure to separate it from conscious recollection of details. The goal of our instructions is to satisfy assumptions underlying the process-dissociation procedure and so requires that participants exclude old words *only on the basis of recollection*. If participants exclude words because of fluency, the assumptions underlying our equations are violated and estimates are invalid. We have discussed evidence to show that participants did follow instructions in our inclusion/exclusion experiments (Toth et al., 1995). Exclusion on the basis of recollection is not an exotic task, but rather is

one with which participants have a great deal of experience in their daily existence. For example, success in keeping a secret seems best accomplished by exclusion based on recollection, as is success at avoiding retelling a story to the same audience.

5. Process dissociation and remember/know judgments

“Remember/know” judgments, invented by Tulving (1985) and studied extensively by Gardiner and his associates (Gardiner, 1988; Gardiner and Java, 1991; Gardiner and Parkin, 1990; Parkin and Walter, 1992), are a measure of the phenomenological experiences of memory. Their work has helped revive interest in the phenomenology of memory and legitimize it as a research topic (Brewer, 1992). A Remember response indicates that recognition of a word was accompanied by conscious recollection of the details of its prior study, including its appearance or an association it triggered. A Know response is defined as the inability to recollect any details of the study presentation in combination with a feeling of familiarity or certainty that the word was studied.

Several variables produce dissociations between remember and know responses. The probability of “remember” responses is affected by manipulations such as level of processing, divided attention, and age, whereas the probability of “know” responses is typically unaffected, much as has been found regarding estimates of conscious and automatic memory used in the process-dissociation procedure (for a review see Gardiner and Java, 1993).

The parameters estimated in process dissociation come from a combination of awareness and control based on that awareness. To link the process dissociation to the remember/know procedure, one must move from phenomenological reports of remember and know to some hypothesis about the relation between the processes that give rise to them. If one assumes that the processes that give rise to the phenomenological experience of remembering versus knowing are independent, then one acknowledges the possibility that they can co-occur. That is, one process may give rise to the subjective experience of conscious recollection of the details of an experience while another process that normally supports the feeling of familiarity or knowing that the event occurred also takes place. The subjective experience may be one of “remembering”, as that probably overshadows a subjective experience of knowing (and the instructions define knowing as something that can only occur in the absence of remembering details). Therefore, the straight probability of a know response in a memory experiment will underestimate the degree to which the underlying process has occurred, just as use of an exclusion procedure in the fame paradigm underestimates the degree to which familiarity is incremented by prior study.

According to an independence assumption, the estimate of the know process, K , should be conditionalized on the opportunity to have such a response. Specifically, K should be calculated as a function of one minus the probability of a remember response. In contrast, Gardiner and colleagues and other investigators analyze the straight proportion of know responses. That calculation implicitly assumes an exclusivity relation between the process that gives rise to instances of remember and the

process that gives rise to instances of know. Therefore, if a variable powerfully increases the likelihood of remembering, there is little opportunity for a person to express the familiarity in the absence of remembering that they are told to call cases of “knowing.”

Jacoby et al. (1997) compared the results of the estimates gained from the process-dissociation procedure with the estimates gained from the remember/know procedure with the independence assumption (IRK) and found parallel patterns among conditions. In fact, the values of the estimates themselves were extraordinarily close across all four parameter estimates for items that were read versus heard at study. Such converging evidence between the two procedures is very encouraging. However, because the process dissociation measures R as that which affords control over responses, and the remember/know procedure measures phenomenological experience, we expect that the two need not always coincide.

The fact that manipulations of fluency primarily affect know responses also supports the convergence of phenomenological reports and the analysis of underlying processes. Rajaram (1993) used Jacoby and Whitehouse’s procedure of presenting a brief preview word prior to each word on the recognition memory test and found that it influenced the likelihood that participants would say they “knew” the item had been on the list. Lindsay and Kelley (1996) manipulated fluency of access to an item in fragment cued recall by presenting three versus two letters as cues, and found that doing so increased the estimates of K . However, if one could increase the fluency of the production of details of the prior event, one should be able to see a corresponding increase in remembering. That is, remembering could reflect fluency but of a different sort than that reflected by knowing. Ability to fluently produce details of a prior experience is interpreted as evidence of remembering and is also open to misattributions (Jacoby et al., 1989).

6. Are automatic influences of memory an accessibility bias?

A variant of the process-dissociation procedure separates the contributions of two processes to a task by manipulating the materials across conditions rather than manipulating instructions to the subjects across an inclusion and exclusion condition. Basically, the logic involves including materials on a test where the two processes could act in concert versus in opposition. Lindsay and Jacoby (1994) applied such logic to the Stroop task, and Hay and Jacoby (1996) and Kelley (in preparation) applied it to cued recall. For example, Hay and Jacoby established habitual responses such as “bone” to cues such as knee – b-n- in the first stage of the experiment. Following that, participants studied short lists of paired associates, and took a cued recall test. The items on the test were either congruent with the habit (knee-bone) or incongruent with the habit (knee-bend). Habit and recollection were assumed to make independent contributions to cued recall, and the equations for the in-concert versus in-opposition cases reflected the independence assumption (e.g., the probability of giving the correct response was assumed to equal $R + (1 - R) H$). The independence of habit and recollection was affirmed by finding manipulations that

produced dissociative effects on the estimates: Deadlines for retrieval reduced R but not H; strengthening habit in the first phase increased H but not R.

The habit of responding “knee-bone” whether or not it had been studied on the Phase 2 list can be thought of as an automatic influence that is an accessibility bias. Similarly, implicit memory effects in a task such as perceptual identification may also reflect an accessibility bias that is independent of “true” perception. Others have argued that performance on an indirect memory test such as perceptual identification does not reveal enhanced processing of items, but instead reflects a bias to respond with the studied item (McKoon and Ratcliff, 1995; Ratcliff and McKoon, 1996; Ratcliff and McKoon, 1997). Jacoby et al. (in press) re-analyzed the perceptual identification data from Ratcliff and McKoon (1997) using the process-dissociation equations, by comparing conditions in which memory and perception would act in concert (e.g., study the word “died”, later attempt to perceptually identify “died”) versus in opposition (e.g., study the word “died”, attempt to perceptually identify “lied”). The process-dissociation equations revealed a double dissociation in that exposure duration only affected the estimate of perception whereas time delay between study and test only affected the estimate of memory. The process-dissociation equations capture the separate effects of memory and perception on the macro level, whereas Ratcliff and McKoon’s counter model fits data on the micro-level.

7. Future directions

In this last section, we briefly outline some future directions for research, mentioning questions that we find of interest. We draw on similarities between the notion of a fluency heuristic and developments in other areas, particularly social psychology and investigations of emotion.

Training subjective experience: Much of our work has been aimed at showing that subjective experience can be misled. Demonstrations of that sort are important to establish that subjective experience can reflect reliance on a fluency heuristic. However, concentrating on errors ignores the fact that subjective experience is usually accurate and makes an important contribution to supervisory functions. For example, people enrolled in a training program are motivated by their perception that they are learning from the program. Superior training programs that produce more learning and transfer but do not maintain a high level of the subjective experience of learning may suffer from a high dropout rate (Jacoby et al., 1994). Can subjective experience be tutored to make it better attuned in training settings?

Subjective experience is probably particularly important for memory rehabilitation programs. A memory training procedure that increased the strength of an automatic component of memory without increasing the likelihood of recollection might leave the client very frustrated by the lack of a subjective experience of “really” remembering, because an automatic form of memory such as familiarity is ambiguous. Furthermore, if one wants to train recollection, then it is important to structure training tasks so that successful performance requires recollection, and cannot be accomplished via automatic forms of memory (Jacoby et al., 1996).

Remembering and the self: Confabulation in patients with head injuries is fascinating in its implications for the underpinnings of subjective experience. Can one arrange conditions for those patients to contrast different bases for memory? It is possible that patients who confabulate are overly reliant on the mere fluency of generating images whereas people with normally functioning memory recognize the ambiguity of fluency and so use alternative bases for responding (e.g., Kelley et al., 1989). Similarly, Bartlett et al. (1995) found that patients with Alzheimer's Disease apparently made recognition judgments of traditional and novel tunes primarily on the basis of familiarity and so showed higher hit and false alarm rates for traditional compared to novel tunes. In contrast, elderly control subjects showed evidence of either raising their criterion of familiarity or using an alternate basis for responding for tunes that they could name, while showing high false alarm rates for traditional tunes that were difficult to name.

Perhaps there is a relation between the ability to monitor the appropriateness of bases for memory judgments and other monitoring constructs such as self-monitoring (Snyder, 1974). Self-monitoring is an individual difference construct that reflects people's propensity to try to act according to what is situationally appropriate, rather than according to their values and self-concept. Older people have lower self-monitoring scores than do younger people. Similarly, aging may lead to a lower capacity to monitor whether familiarity is a sufficiently diagnostic basis for memory judgments (see Burgess and Shallice, 1996).

Subjective experience and the brain: Neural imaging studies provide powerful new ways to link memory constructs and brain mechanisms, and to reveal the need for new constructs (Gabrieli et al., 1996; Nyberg et al., 1996; Schacter et al., 1996). Subjective experience that reflects memory is commonly described as a "feeling" of familiarity or of some other type. Use of the term feeling suggests a relation to emotions, and the role cognitive appraisal plays in the generation of emotions. Can that relation be exploited to help memory theorists take advantage of advances in understanding the neural basis of emotions (e.g., LeDoux, 1994)?

The rarity of memory awareness: A casual reading of the social psychology literature might suggest that people do not have enough time to do anything – they are too busy being self-aware, drawing inferences about the personality traits of others, and checking their attitudes. However, the self-awareness and attributions regarding the behavior of others that has been given so much attention by social psychologists is usually elicited by direct questions. Left to their own devices, people are seldom self-aware. The subjective experience of remembering and the feeling of familiarity are some of those rare events that constitute self-awareness. Wicklund and his colleagues (Wicklund, 1975; Wicklund and Frey, 1980) in their "self-awareness" theory ask the important question of when self-awareness arises. They answer that self-awareness arises in response to a disruption of performance. The subjective experiences of memory might also arise in response to a disruption in the flow of behavior (Jacoby and Kelley, 1990). Past experience might typically guide behavior without awareness. But if a task cannot be accomplished by the constraints imposed by the environment plus the skills from long-term memory, and the tunings to those skills provided by automatic influences of memory, then

performance is disrupted. Conscious reminders (Schank, 1982; Ross, 1984) then might help people regain control over the task.

One of the rare exceptions where experience is dominated by conscious recollection is social interaction. In fact, Katherine Nelson and her colleagues argue that autobiographical memory serves primarily a social function. Much more needs to be known about how natural situations, rather than experimenters, “ask” questions that give rise to the subjective experience of memory. Although we believe use of a fluency heuristic plays an important role in answering that question, it is clearly only one of a variety of heuristics that are employed (Johnson, 1989).

8. Summary

The James–Lange view of emotion provoked a great deal of controversy and that controversy continued in response to Schachter’s (e.g., Schachter and Singer, 1962) attributional account of emotion. James also entertained a version of a fluency hypothesis about familiarity. He suggested that because of the spread of activation from representations of an event to associated “dates, names, concrete surroundings”, people would have “that sense of expectation gratified” and “a character of ease to familiar percepts (James, 1980, pp. 634–635)”. We suspect that if the notion of a fluency heuristic as a basis for subjective experience gains credence, it, too will be a topic for controversy. A modified version of the attributional view of emotion recovered from the assault of critics rather well, and we hope the same will be true for the fluency view of familiarity.

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