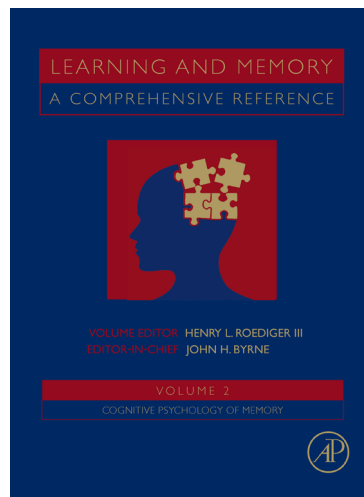


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2.15 Memory in and about Affect

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Philosophers, politicians, and playwrights alike have recognized for centuries the capacity of moods to color the way people remember the past, experience the present, and forecast the future. Psychologists, however, were relatively late to acknowledge this reality, despite a number of promising early leads (e.g., Rapaport, 1942/1961; Razran, 1940). Indeed, it is only within the past 30 years that empirical investigations of the interplay between affect and cognition have been published with regularity in mainstream psychology journals (see LeDoux, 1996).

Psychology's late start in exploring the affect-cognition interface reflects the fact that neither behaviorism nor cognitivism – the two paradigms that dominated the discipline throughout the twentieth century – ascribed much importance to affective phenomena, whether in the form of specific, short-lived emotional reactions or more nebulous, long-lasting mood states (for detailed discussion of affect-related concepts, see Russell and Feldman Barrett, 1999; Russell and Lemay, 2000).

From the perspective of the radical behaviorist, all unobservable mental events, including those affective in nature, were by definition deemed beyond

the bounds of scientific psychology. Though early behaviorist research examined the environmental conditioning of emotional responses, later studies focused mainly on the behavioral consequences of readily manipulated drive states, such as thirst or fear. In such studies, emotion was instilled in animals through crude if effective means, such as electric shock, and emotionality was operationalized by counting the number of fecal boluses deposited by small, scared animals. As a result, behaviorist research and theory added little to our understanding of the interrelations between affect and cognition.

Until recently, the alternative cognitive paradigm also had little interest in affective phenomena. To the extent that the cognitive revolutionaries of the early 1960s considered affects at all, they typically envisaged them as disruptive influences on 'proper' – read 'emotionless' or 'cold' – thought processes. Thus, the transition from behaviorism to cognitivism allowed psychology to reclaim its head, but did nothing to recapture its heart.

Things are different today. Affect is now known to play a key role in how information about the world is processed and represented. Moreover, affect underlies the cognitive representation of social experience (Bower and Forgas, 2000), and emotional responses can serve as an organizing principle in cognitive categorization (Niedenthal and Halberstadt, 2000). Thus, the experience of affect – how we feel about people, places, and events – is central to people's cognitive representations of themselves and the world around them.

When it comes to memory, a major theme of this book, two overarching questions are of interest. One of these concerns memory 'in' affect: How do affective states or moods influence the acquisition and retention of information? The other question involves memory 'about' affect: What determines the accuracy and other attributes of memory for emotionally charged events? Over the past 30 years, both questions have been pursued with a wide array of subject species (humans, mice, mollusks, etc.), scientific approaches (experiential, physiological, neuroimaging), and memory methods (different materials, tasks, and measures). In addition, each of these highly general questions subsumes a host of more specific issues, including such varied topics as the consistency of flashbulb recollections (Talarico and Rubin, 2003), cognitive and clinical investigations of mood-dependent memory (Eich and Macaulay, 2006), dissociable influences of affective valence and arousal on memory vividness (Kensinger and Corkin, 2004;

Kensinger and Schacter, 2006), and neural systems underlying the encoding and retrieval of emotional events in animals and humans (LaBar and Cabeza, 2006; Phelps, 2006).

This chapter surveys only a small segment of the vast affect/memory literature and its scope is limited to human cognitive and social research. Whereas the first part of the chapter covers mood-congruent cognition, a concept that is central to understanding how affective states influence memory, the second part focuses on memory for trauma, a controversial topic with important implications both for cognitive theory and for clinical practice. Given that mood congruence has had little overlap, conceptually or methodologically, with research on memory for traumatic events, our approach will be to treat memory in and about affect as distinct topics. Nevertheless, consideration of these topics together invites exploration of the possible empirical and theoretical issues that might unite them. To this end, we close with a discussion of potential ways in which the principles and findings of mood congruence might apply to understanding the processes leading to reports of recovered memories of trauma.

2.15.1 Memory in Affect

People often acquire, remember, and interpret information about themselves, and the world around them, in a manner that matches their current state of affect or mood. However, these mood-congruent effects are not universal, but depend for their expression on a variety of task-, person-, and situation-specific variables (Bower and Forgas, 2000). Since the early 1980s, a great deal of effort has gone into explaining why mood-congruent effects are robust and reliable under certain circumstances, but weak or nonexistent under others. The fruits of this effort are the focus of discussion in this part of the chapter.

We begin by introducing the concepts of affect priming and affect-as-information, both of which are central in understanding the impact of moods on the substance of cognition, or what people think. Attention then turns to the processing consequences of affect, that is, the impact of moods on cognitive style, or how people think. These opening remarks on cognitive substance versus style will set the stage for discussion of an integrative theory – Forgas's (1995, 2002) affect infusion model (AIM) – that seeks to specify the ways in which affect influences cognition in general and social cognition in

particular. Next we consider the critical part that different information processing strategies play in the occurrence of mood congruence, and we conclude this section by summarizing some of the strengths and shortcomings of the AIM.

2.15.1.1 Affect Priming and Affect-as-Information

Several theorists maintain that moods influence the content of cognition because they influence the memory structures people rely on when processing information. For example, [Wyer and Srull \(1989\)](#) suggested that recently activated concepts are more accessible because such concepts are returned to the top of mental storage bins, which in turn means that subsequent sequential searches are more likely to access the same concepts again. As affective states facilitate the use of positively or negatively valenced mental concepts, this could account for the greater use of mood-congruent constructs in subsequent tasks.

A more comprehensive explanation of this effect was provided by [Bower's \(1981\)](#) associative network model. On this view, the observed links between affect and cognition are neither motivationally based (cf. the psychoanalytic theory of [Feshback and Singer, 1957](#)), nor are they the result of merely incidental, spatiotemporal associations (cf. the conditioning theory of [Byrne and Clore, 1970](#)). Instead, [Bower \(1981\)](#) argued that affect is integrally linked to an associative network of mental representations. Accordingly, the activation of an affective state should selectively and automatically prime associated thoughts and representations previously linked to that affect, and these concepts should be more likely to be used in subsequent constructive cognitive tasks.

Consistent with the network model, early studies provided strong support for the concept of affective priming, indicating mood congruence across a wide range of cognitive tasks. For example, people induced to feel good or bad tend to selectively remember more mood-congruent details from their childhood and more of the real-life events they had recorded in a daily diary for a week ([Bower, 1981](#)). Mood congruence was also observed in subjects' interpretations of social behaviors and in their impressions of other people ([Bower and Forgas, 2000](#)).

However, subsequent research showed that mood congruence is subject to several boundary conditions (see [Blaney, 1986](#); [Bower, 1987](#); [Singer and Salovey, 1988](#)). Difficulties in demonstrating reliable

mood-congruent effects were ascribed to such varied causes as the lack of sufficiently strong or intense moods ([Bower and Mayer, 1985](#)), the subjects' inability to perceive a meaningful, causal connection between their current mood and the cognitive task they are asked to perform ([Bower, 1991](#)), and the use of tasks that prevent subjects from processing the target material in a self-referential manner ([Blaney, 1986](#)). Interestingly, mood-congruent effects tend to be more reliably obtained when complex and realistic materials are used in conjunction with tasks (e.g., association generation, impression formation, or inference making) that require a high degree of open, constructive processing (e.g., [Bower and Forgas, 2000](#); [Mayer et al., 1992](#)). Such tasks provide people with a rich set of encoding and retrieval cues and thus allow affect to more readily function as a differentiating context ([Bower, 1992](#)). A similar point was made by [Fiedler \(1991\)](#), who suggested that mood congruence may obtain only in constructive cognitive tasks – those that involve an open-ended search for information (as in recall tasks) and the active elaboration and transformation of stimulus details using existing knowledge structures (as in judgmental and inferential tasks).

It appears, then, that affect priming occurs when an existing affective state preferentially activates and facilitates the use of affect-consistent information from memory in a constructive cognitive task. The consequence of affect priming is affect infusion: The tendency for judgments, memories, thoughts, and behaviors to become more mood congruent ([Forgas, 1995, 2002](#)). But in order for such infusion effects to emerge, it is important that subjects adopt an open, elaborate information processing strategy that facilitates the incidental use of affectively primed memories and information. Thus, the nature and extent of affective influences on memory and cognition should largely depend on what kind of information processing strategy people employ in a particular situation. Later we will review the empirical evidence for this prediction and describe an integrative theory that emphasizes the role of information-processing strategies in moderating mood congruence.

Alternatively, the affect-as-information (AAI) model of [Schwarz and Clore \(1983, 1988\)](#) suggests that “rather than computing a judgment on the basis of recalled features of a target, individuals may . . . ask themselves: ‘How do I feel about it? [and] in doing so, they may mistake feelings due to a pre-existing state as a reaction to the target” ([Schwarz,](#)

1990: 529). Thus, the model implies that mood congruence in judgments is due to an inferential error, as people misattribute a preexisting affective state to a judgmental target.

The AAI model incorporates ideas from three past research traditions. First, the predictions of the model are often indistinguishable from earlier conditioning research by [Clare and Byrne \(1974\)](#). Whereas the conditioning account claimed that spatiotemporal contiguity is chiefly responsible for linking affect to judgments, the AAI model posits an internal inferential process as producing the same effects (see [Berkowitz et al., 2000](#)). A second tradition that informs the AAI model comes from research on misattribution, according to which judgments are often inferred on the basis of salient but irrelevant heuristic cues – in this case, affective state. Thus, the AAI model also predicts that only previously unattributed affect can produce mood congruence. Finally, the model also shows some affinity with research on judgmental heuristics, insofar as affective states are thought to function as heuristic cues in informing people's judgments.

People typically rely on affect as a heuristic cue when they lack either or both the motivation and the cognitive resources to process information more extensively. This happens when “the task is of little personal relevance, when little other information is available, when problems are too complex to be solved systematically, and when time or attentional resources are limited” ([Fiedler, 2001](#): 175). For example, some of the earliest and still most compelling evidence for the AAI model came from an experiment ([Schwarz and Clore, 1983](#)) that involved telephoning respondents and asking them unexpected and unfamiliar questions. In this situation, subjects have little personal interest or involvement in responding to a stranger, and they have neither the motivation, the time, nor the cognitive resources to engage in extensive processing. Relying on prevailing affect to infer a response seems a reasonable strategy under such circumstances. In a conceptually similar example, [Forgas and Moylan \(1987\)](#) asked people to complete an attitude survey on the sidewalk outside a cinema in which they had just watched either a happy or a sad movie. The results showed strong mood congruence: Happy theatergoers gave much more positive responses than did their sad counterparts. In this situation, as in the study by [Schwarz and Clore \(1983\)](#), respondents presumably had insufficient time, motivation, or capacity to engage in elaborate processing, and hence they may well have

relied on their temporary affect as a heuristic cue to infer a reaction. Thus, depending on the task, situation, and resources at hand, either affect priming or AAI can take the lead in coloring or infusing cognition with current affect.

2.15.1.2 Processing Consequences of Affect

Affective states or moods shape not only the substance of cognition but also its style. It has been proposed that positive affect recruits less effortful and more superficial processing strategies; in contrast, negative affect seems to trigger a more analytic and vigilant processing style ([Clark and Isen, 1982](#); [Schwarz, 1990](#); [Mackie and Worth, 1991](#)). However, more recent studies have shown that positive affect can also produce distinct processing advantages: Happy people often adopt more creative and inclusive thinking styles and display greater mental flexibility than do sad subjects ([Bless, 2000](#); [Fiedler, 2000](#); [Isen, 2004](#)).

Several theories have sought to explain affective influences on processing strategies. One suggestion is that the experience of a negative mood, or any affective state, gives rise to intrusive, irrelevant thoughts that deplete attentional resources, which in turn leads to poor performance in a variety of cognitive tasks ([Ellis and Ashbrook, 1988](#); [Ellis and Moore, 1999](#)). An alternative hypothesis points to the motivational consequences of positive and negative affect: Whereas people experiencing positive affect may try to maintain a pleasant state by refraining from any effortful activity, negative affect may motivate people to engage in vigilant, effortful processing ([Isen, 1984](#)). In a variation of this idea, [Schwarz \(1990\)](#) has suggested that affective states have a signaling or tuning function, informing the person that relaxed, effort-minimizing processing is appropriate in the case of positive affect, whereas vigilant, effortful processing is best suited for negative affect.

These various accounts all assume that positive and negative affect decrease or increase the effort, vigilance, and elaborateness of information processing, albeit for different reasons. Recently, [Bless and Fiedler \(2006\)](#) have conjectured that the evolutionary significance of positive and negative affect is not simply to influence processing effort, but to trigger two fundamentally different processing styles. They suggest that positive affect promotes a more schema-based, top-down, assimilative processing style, whereas negative affect produces a more bottom-up, externally focused, accommodative processing strategy.

These strategies can be equally vigilant and effortful, yet produce markedly different cognitive outcomes by directing attention to internal or external sources of information.

These affect-induced processing differences may well have evolutionary origins, consistent with the idea that the basic function of affective states is to rapidly trigger cognitive strategies most likely to produce adaptive responses to a situation (Frijda, 1986). In other words, affect may operate like domain-specific adaptation that meets the requirements for special design (Haselton and Ketelaar, 2006; also see Forgas et al., 2007).

2.15.1.3 Cognitive Benefits of Mild Dysphoria for Eyewitness Memory

Another perspective on the processing consequences of affect is provided by recent research showing that affect-induced differences in processing style have major implications for memory and memory-based social cognitive tasks, including some surprising cognitive advantages associated with mild dysphoria.

For example, a recent series of studies revealed a beneficial effect of negative affect on eyewitness memory (Forgas et al., 2005). Affect can impact eyewitness memory at any or all of three distinct stages: (1) when the event is first witnessed (encoding stage), (2) when misleading information is encountered later on (post-event stage), and (3) when the information is retrieved (retrieval stage). Several experiments examined mood effects at Stage 2 and found that positive affect promoted, and negative affect inhibited, the incorporation of false details into eyewitness memories (Forgas et al., 2005), consistent with the more attentive, accommodative processing style associated with negative affect that may have helped witnesses to identify misleading details when exposed to them (Bless and Fiedler, 2006).

In one study (Forgas et al., 2005, Experiment 1), participants viewed pictures showing a car crash scene (negative event) and a wedding party scene (positive event). One hour later, following the induction of a happy, sad, or neutral mood, participants completed a questionnaire about the scenes that either contained or did not contain misleading information. In this particular study, moods were induced by asking participants to reflect upon, write about, and emotionally relive either a positive, neutral, or negative experience from their personal past. In addition to this life-events technique, many other methods of mood modification (involving videos, music, guided

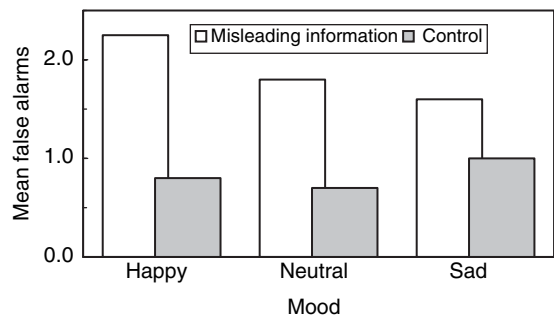


Figure 1 Mean false alarms to misleading postevent information as a function of participants' mood (happy, neutral, or sad) and condition (misleading information previously presented versus control). From Forgas JP, Vargas P, and Laham S (2005) Mood effects on eyewitness memory: Affective influences on susceptibility to misinformation. *J. Exp. Soc. Psychol.* 41: 574–588; Experiment 1; used with permission from Elsevier.

imagery, etc.) are available to investigators in the affect/cognition area (see Coan and Allen, 2007). After an additional interval filled with other tasks, the accuracy of their eyewitness memory for the scenes was tested. As predicted, and as indicated in **Figure 1**, exposure to misleading information significantly reduced eyewitness accuracy, an effect that, remarkably, was increased by positive mood and decreased by negative mood. In fact, negative mood almost completely eliminated the familiar misinformation effect.

In a second study (Forgas et al., 2005, Experiment 2), students in a lecture hall witnessed a staged aggressive encounter between a lecturer and a female intruder. One week later, eyewitnesses to this episode were induced into a positive or negative mood and then completed a questionnaire about the episode that either did or did not contain planted, misleading information. When the accuracy of their eyewitness memory for the episode was subsequently tested, negative affect again seemed to have all but eliminated this source of error in eyewitness memory. Signal detection analyses confirmed that negative affect actually improved eyewitnesses' ability to discriminate between correct and misleading details.

Can people suppress the impact of their moods on their thinking when instructed to do so? In a third study (Forgas et al., 2005, Experiment 3), participants watched a videotape of a complex event (a wedding or a convenience-store robbery). After viewing a happy or sad videotape, they completed a short questionnaire that either did or did not contain

misleading information. Some participants were also instructed to disregard and control their current affective state. Exposure to misleading information again reduced eyewitness accuracy, and did so most when people were in a happy rather than a sad mood. Instructions to control affect did not reduce this mood effect, but rather, produced an overall conservative response bias.

These experiments offer convergent evidence that negative moods can have significant adaptive effects on memory and cognitive performance, by promoting a more focused, accommodative processing style that reduced people's susceptibility to misleading information and thus improved eyewitness memory. These results are consistent with theories that predict that good and bad moods should have an asymmetric effect on processing strategies and outcomes (Forgas, 1995, Bless, 2000; Forgas, 2002).

2.15.1.4 Mood Congruence and the Affect Infusion Model

We have seen that affective states have clear if complex effects on both the substance of cognition (i.e., the contents of one's thoughts) and its style (e.g., whether information is processed systematically or superficially). It is also clear, however, that affective influences on cognition are context-specific. A comprehensive explanation of these effects needs to specify the circumstances that promote or impede mood congruence, and should also define the conditions likely to trigger either affect priming or affect-as-information mechanisms.

The AIM (Forgas, 1995) seeks to accomplish these goals by expanding on Fiedler's (1991) idea that mood congruence is most likely to occur when circumstances call for an open, constructive style of information processing. Such a style involves the active elaboration of the available stimulus details and the use of memory-based information in this process. The AIM thus predicts that (1) the extent and nature of affect infusion should be dependent on the kind of processing strategy that is used, and (2) all things being equal, people should use the least effortful and simplest processing strategy capable of producing a response. As this model has been described in detail elsewhere (Forgas, 1995, 2002), only a brief overview will be provided here.

The AIM identifies four processing strategies that vary according to both the degree of openness or constructiveness of the information-search strategy and the amount of effort exerted in seeking a

solution. The direct access strategy involves the retrieval of preexisting responses and is most likely when the task is highly familiar and when no strong situational or motivational cues call for more elaborate processing. For example, if you were asked to make an evaluative judgment about a well-known political leader, a previously computed and stored response would come quickly and effortlessly to mind, assuming that you had thought about this topic extensively in the past. People possess a rich store of such preformed attitudes and judgments. Given that such standard responses require no constructive processing, affect infusion should not occur.

The motivated processing strategy involves highly selective and targeted thinking that is dominated by a particular motivational objective. This strategy should be impervious to affect infusion (Clark and Isen, 1982) and may produce mood-incongruent outcomes when the motivation is to control or reverse affect congruence (Forgas and Ciarrochi, 2002). For instance, if in a job interview you are asked about your attitude toward the company you want to join, the response will be dominated by the motivation to produce an acceptable response. Open, constructive processing is inhibited and affect infusion is unlikely to occur. The consequences of motivated processing should depend on the particular processing goal and may also produce a reversal of mood-congruent effects (Berkowitz et al., 2000).

The remaining two processing strategies require more constructive and open-ended information search strategies, and thus facilitate affect infusion. Heuristic processing is the kind of superficial, quick processing style people are likely to adopt when they lack motivation or resources to process more extensively (Schwarz and Clore, 1983; Forgas and Moylan, 1987). Heuristic processing can lead to affect infusion as long as people rely on affect as a simple inferential cue and depend on the 'how do I feel about it' heuristic to produce a response (Schwarz and Clore, 1988; Clore et al., 2001).

When simpler strategies such as direct access, motivated processing, or heuristic processing prove inadequate, people need to engage in substantive processing to satisfy the demands of the task at hand. According to the AIM, substantive processing should be adopted when (1) the task is in some ways demanding, atypical, complex, novel, or personally relevant, (2) there are no direct-access responses available, (3) there are no clear motivational goals to guide processing, and (4) adequate time and other

processing resources are available. Substantive processing is an inherently open and constructive strategy, and affective states may selectively prime or enhance the accessibility of related thoughts, memories, and interpretations. The model makes the interesting and counterintuitive prediction that affect infusion – and hence mood congruence – should be increased when extensive and elaborate processing is required to deal with a more complex, demanding, or novel task. This prediction has been borne out by several studies that will be summarized shortly.

The AIM also specifies a range of contextual variables related to the task, the person, and the situation that jointly influence processing choices. For example, greater task familiarity, complexity, and typicality should recruit more substantive processing. Personal characteristics that influence processing style include motivation, cognitive capacity, and personality traits such as self-esteem (Smith and Petty, 1995; Rusting, 2001). Situational factors that influence processing style include social norms, public scrutiny, and social influence by others (Forgas, 1995).

An important feature of the AIM is that it recognizes that affect itself can also influence processing choices. As noted earlier, Bless and Fiedler (2006) have proposed that positive affect typically generates a more assimilative, top-down, schema-driven processing style whereby new information is assimilated into what is already known. In contrast, negative affect often promotes a more accommodative, piecemeal, bottom-up processing strategy in which attention to external events dominates over existing stored knowledge.

The key prediction of the AIM is the absence of affect infusion when direct access or motivated processing is used and the presence of affect infusion during heuristic and substantive processing. The implications of this model have been investigated in many studies involving several substantive areas in which mood congruence has been demonstrated, including affective influences on attention, learning, memory, and social cognition. The following subsections present a snapshot of some of these studies and areas.

2.15.1.4.1 Mood congruence in attention and learning

Many everyday cognitive tasks are performed under conditions of considerable information overload, when people need to select a small sample of

information for further processing. Affect may have a significant influence on what people will pay attention to and learn (Niedenthal and Setterlund, 1994). Due to the selective activation of an affect-related associative base, mood-congruent information may receive greater attention and be processed more extensively than affectively neutral or incongruent information (Bower, 1981; Bower and Cohen, 1982). Several studies have shown that people spend longer reading mood-congruent material, linking it into a richer network of primed associations; as a result, they are better able to remember such information (Bower and Forgas, 2000).

These effects occur because “concepts, words, themes, and rules of inference that are associated with that emotion will become primed and highly available for use ... [in] ... top-down or expectation-driven processing ... [acting] ... as interpretive filters of reality” (Bower, 1983: 395). Thus, there is a tendency for people to process mood-congruent material more deeply, with greater associative elaboration, and thus learn it better. Consistent with this notion, depressed psychiatric patients tend to learn and remember depressive words particularly well, a cognitive bias that disappears once the depressive episode is over (Bradley and Mathews, 1983; Watkins et al., 1992). However, mood-congruent learning is seldom seen in patients suffering from anxiety (Watts and Dalgleish, 1991; Burke and Mathews, 1992), perhaps because anxious people tend to use particularly vigilant, motivated processing strategies to defend against anxiety-arousing information (Mathews and MacLeod, 1994; Ciarrochi and Forgas, 1999). Thus, as predicted by the AIM, different processing strategies appear to play a critical role in mediating mood congruence in learning and attention.

2.15.1.4.2 Mood congruence in memory

Several studies have shown that people are better able to consciously or explicitly recollect autobiographical memories that match their prevailing mood (Bower, 1981). Depressed patients display a similar pattern, preferentially remembering aversive childhood experiences, another kind of cognitive bias that disappears once depression is brought under control (Lewinsohn and Rosenbaum, 1987). In line with the AIM, these mood-congruent effects also emerge when people try to recall complex social stimuli (Fiedler, 1991; Forgas, 1993).

Research using implicit tests of memory, which do not require conscious recollection of past experience, also provides evidence of mood congruence. For

example, depressed people tend to complete more word stems (e.g., 'can') with negative than with positive words they have studied earlier (e.g., 'cancer' vs. 'candy'; Ruiz-Caballero and Gonzalez, 1994). Similar results have been obtained in other studies involving experimentally induced states of happiness or sadness (Tobias et al., 1992).

2.15.1.4.3 Mood congruence in associations and interpretations

Cognitive tasks often require people to go beyond the information given, forcing them to rely on associations, inferences, and interpretations to construct a judgment or a decision, particularly when dealing with complex and ambiguous social information (Heider, 1958). Affect can prime the kind of associations used in the interpretation and evaluation of a stimulus (Clark and Waddell, 1983).

The greater availability of mood-congruent associations can have a marked influence on the top-down, constructive processing of complex or ambiguous details (Bower and Forgas, 2000). For example, when asked to freely associate to the cue 'life,' happy subjects generate more positive than negative associations (e.g., 'love, freedom' vs. 'struggle, death'), whereas sad subjects do the opposite (Bower, 1981). In a related vein, mood-congruent associations emerge when emotional subjects daydream or concoct stories about fictional characters depicted in the Thematic Apperception Test (Bower, 1981). Mood-primed associations also play an important role in clinical states: Anxious people tend to interpret spoken homophones such as pane/pain or dye/die in the more anxious, negative direction (Eysenck et al., 1987), consistent with the greater activation these mood-congruent concepts receive.

Such mood-congruent effects can have a marked impact on many types of social judgments, including perceptions of human faces (Schiffenbauer, 1974), impressions of people (Bower and Forgas, 2000), and self-perceptions (Sedikides, 1995). However, several studies have shown that this associative effect is diminished as the targets to be judged become more clear-cut and thus require less constructive processing (Forgas, 1995). Such a diminution in the associative consequences of mood with increasing stimulus clarity again suggests that open, constructive processing is crucial for mood congruence to occur. This same mechanism also leads to mood congruence in more complex and elaborate social judgments, such as

judgments about the self and others, as the results sketched in the following section suggest.

2.15.1.4.4 Mood congruence in self-judgments

Affective states have a strong assimilative influence on memory-based judgments about the self: Positive affect improves and negative affect impairs the valence of self-conceptions. In one study (Forgas et al., 1990), happy or sad students who had scored well or poorly on a recent exam were asked to rate the extent to which their test performance was attributable to factors that were internal in origin and stable over time. Compared to their negative mood counterparts, students in a positive mood were more likely to claim credit for success, making more internal and stable attributions for high test scores, but less willing to assume personal responsibility for failure, making more external and unstable attributions for low test scores.

Of related interest is a study by Sedikides (1995), who asked subjects to evaluate a series of self-descriptions related to their behaviors or personality traits while they were in a happy, sad, or neutral mood. Based on the AIM, Sedikides predicted that highly rehearsed core conceptions of the self should be processed quickly using the direct-access strategy and hence should show no mood-congruent bias; in contrast, less salient, peripheral self-conceptions should require more time-consuming substantive processing and accordingly be influenced by an affect-priming effect. The results supported these predictions, making Sedikides' (1995) research the first to demonstrate differential mood-congruent effects for central versus peripheral conceptions of the self.

Affect also appears to have a greater congruent influence on self-related memories and judgments made by people with low versus high self-esteem, which may reflect a parallel difference in the stability of their respective self-concepts (Brown and Mankowski, 1993). For instance, Smith and Petty (1995) observed stronger mood congruence in the self-related memories reported by low rather than high self-esteem individuals. As predicted by the AIM, these findings suggest that low self-esteem people need to engage in more open and elaborate processing when thinking about themselves, increasing the tendency for their current mood to influence the outcome.

Affect intensity may be another moderator of mood congruence. One study showed that mood

congruence is greater among people who score high on measures assessing openness-to-feelings as a personality trait (Ciarrochi and Forgas, 2000). However, other studies suggest that mood congruence in self-related memories and judgments can be spontaneously reversed as a result of motivated processing strategies. Sedikides (1994) observed that after mood induction, people initially generated self-statements in a mood-congruent manner. However, with the passage of time, negative self-judgments spontaneously reversed, suggesting the operation of an automatic process of mood management. Research by Forgas and Ciarrochi (2002) replicated these results and indicated further that the spontaneous reversal of negative self-judgments is particularly rapid and pronounced in people with high self-esteem.

In summary, moods have been shown to exert a strong congruent influence on self-related memories and judgments, but only when some degree of open and constructive processing is required and when there are no motivational forces to override mood congruence. Research to date also indicates that the infusion of affect into self-judgments is especially likely when these judgments (a) relate to peripheral in contrast to central aspects of the self, (b) require extensive, time-consuming processing, and (c) reflect the self-conceptions of individuals with low rather than high self-esteem.

2.15.1.4.5 Mood congruence in person perception

The AIM predicts that the more people need to think in order to compute a response, the greater the likelihood that affectively primed ideas will influence the outcome. To test this prediction, several researchers have manipulated the complexity of the subjects' task in order to create more or less demand for elaborate processing.

In one set of studies (Forgas, 1992), happy and sad participants were asked to read and form impressions about fictional characters who were described as being highly typical or highly atypical and having an odd combination of attributes (e.g., an avid surfer whose favorite music is Italian opera). The expectation was that when people have to form an impression about a complex, ambiguous, or atypical individual, they will need to engage in more constructive processing and affectively primed associations should thus have a greater chance to infuse the judgmental outcome.

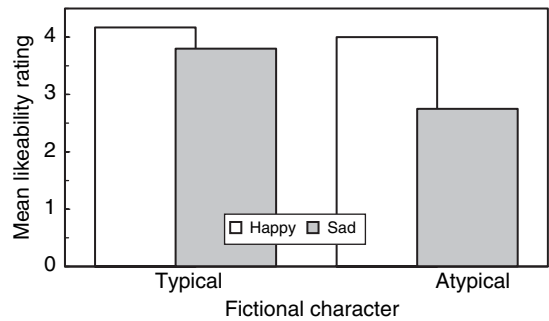


Figure 2 Impact of participants' mood on their ratings of the likeability of typical or atypical fictional characters. From Forgas JP (1992) On bad mood and peculiar people: Affect and person typicality in impression formation. *J. Pers. Soc. Psychol.* 62: 863–875; Experiment 3; used with permission from the American Psychological Association.

Consistent with this reasoning, participants took longer to read about unusual as opposed to conventional characters. Moreover, mood-congruent effects were more pronounced when happy and sad participants judged the likeability of atypical in contrast to typical fictional characters, a finding depicted in Figure 2. Similar results were found in a follow-up study in which the to-be-judged targets were odd versus ordinary couples rather than individuals (Forgas, 1993).

Research investigating the impact of mood on judgments and inferences about real-life interpersonal issues paints a similar picture. For example, partners in long-term, intimate relationships showed clear evidence of mood congruence in their memories and attributions for actual conflicts, and paradoxically, these effects were greater when thinking about more serious conflicts that required more extensive processing (Forgas, 1995). These results provide direct evidence for the process dependence of affect infusion into social judgments and inferences. Even judgments about highly familiar people are more prone to affect infusion when a more substantive processing strategy is used.

Some individual-difference or personality characteristics, such as trait anxiety, can also influence processing styles and thereby significantly moderate the influence of negative mood on intergroup judgments (Ciarrochi and Forgas, 1999). Low trait-anxious whites in the United States reacted more negatively to a threatening black out-group when experiencing negative affect. Surprisingly, high trait-anxious individuals showed the opposite pattern: They went out of their way to control their negative

tendencies when feeling bad and produced more positive judgments. Thus it appeared that low trait-anxious people allowed affect to influence their judgments, while high trait-anxiety combined with aversive mood triggered a more controlled, motivated processing strategy designed to eliminate socially undesirable intergroup judgments.

2.15.1.5 Strengths and Shortcomings of the Affect Infusion Model

To recap, the AIM attempts to account for mood-congruent effects in social cognition (Forgas, 1995). It provides a means of integrating two explanations of mood effects, namely AAI (Schwarz and Clore, 1988) and affect priming (Bower, 1981). It outlines the situations in which each process dominates and therefore is the primary method for affect to influence people's thoughts and behaviors. The model accounts well for mood effects on learning and memory (Bower and Forgas, 2000) and a wide array of affective influences on social cognition, including perceptions of others as well as oneself.

The AIM also casts light on the conditions that are more or less likely to evidence mood-congruent effects. Specifically, when processing is easy and familiar, current mood has less of an impact on task performance than when processing is more demanding, more difficult, and more unusual. Hence, it is precisely when people are paying greater attention, considering carefully, and exerting more cognitive effort that they are likely to be biased by their current, and often unrelated, mood state (Forgas, 1995, 2002).

This pattern of results has an important implication, namely, that such performance differences are more than mere responses to demand characteristics created by experimental mood manipulations, one of the oldest and thorniest issues in contemporary cognition/emotion research (see Polivy and Doyle, 1980; Bower, 1981; Ingram, 1989). Since any demand characteristics that exist should be constant across easy and difficult processing conditions, they cannot be responsible for any behavioral differences that are found between these conditions. Consequently, the greater conceptual precision provided by the AIM makes it a more parsimonious explanation of the data set as a whole.

Though the AIM connects and clarifies data from many domains, several findings are difficult to reconcile with the approach. For instance, the model

suggests that negative affect encourages bottom-up, externally focused processing, but the literature on self-focused attention in depression (Pyszczynski and Greenberg, 1987) indicates that negative affect leads to more internally focused processing, proposals that are clearly in conflict.

Another troublesome subject for the AIM is mood incongruence, a curious phenomenon that has been seen in several studies involving autobiographical memory, person perception, and other social cognitive tasks. Parrot and Sabini (1990, Experiment 2), for instance, found that college students tended to feel happier on clear than on cloudy days – no surprise there. Yet when asked to recollect a salient experience from their high-school years, the students recalled mostly pleasant events on gloomy days and mostly unpleasant events on sunny days.

The causes of such counterintuitive results remain uncertain. The AIM is chiefly concerned with either the presence or absence of mood-congruent effects, not with the reverse. As mentioned earlier, several researchers have suggested that mood incongruence may be related to an individual's ability and desire to strategically regulate his or her mood (e.g., Sedikides, 1994; Forgas and Ciarrochi, 2002), but other factors may also play an important role.

One such factor was discovered accidentally in research (Eich, 1995) dealing with the mood-mediation theory of place-dependent memory: The idea that how well memorial information transfers from one physical environment (e.g., a sunny courtyard) to a different setting (e.g., a dimly lit room) depends not on how similar the two places look but rather on how similar they feel. On this view, place-dependent effects in human memory represent a special, and rather subtle, form of mood-dependent memory (Eich, 2007).

Participants in two studies (university undergraduates) were asked to recollect or generate as many as 16 specific episodes or events, from any time in the personal past, that were called to mind by neutral noun probes, such as ship and street. After recounting the gist of a given event (what happened, who was involved, etc.), students rated the incident along several dimensions, including its original emotionality: How pleasant or unpleasant the event seemed when it took place. Participants completed this task of autobiographical-event generation in one of two environments: either a small, dark, and spartanly furnished basement office or in a warm, inviting, and exquisitely scenic Japanese garden. The expectation, which was confirmed in both studies, was that

students would generally feel happier (more pleasant, more energized) when tested in the latter locale.

Nonetheless, neither experiment provided any evidence of an overall mood-congruent effect: Mean ratings of event emotionality were statistically the same for events that had been generated in the garden versus the office. However, a different picture developed when participants were divided into two groups – aware versus unaware – based on statements they made about the aims and methods of the research in an in-depth postexperimental interview. Whereas participants in the aware group recognized that different environments might evoke different moods, those in the unaware group seemed not to appreciate the possibility of an affect/environment connection.

Among aware subjects, there was clear evidence of mood congruence: Averaging across the two studies, ratings of event emotionality were higher (i.e., more positive) for autobiographical events that had been generated in the garden than in the office. Among unaware subjects, however, the tendency was toward mood incongruence: Events generated in the happy garden were rated as being somewhat less pleasant than those that had been recollected in the sad office.

Additional evidence relating to the awareness factor comes from two recently completed studies (Eich et al., unpublished observations) that were methodologically similar to those outlined earlier in all major respects but one: The frequency with which participants were asked to reflect upon and rate their current mood before, during, and after the task of autobiographical-event generation (which again was carried out in either the garden or office locales). Following the lead of Berkowitz et al. (2000), we reasoned that the very act of assessing one's current mood would enhance awareness of a connection between that mood and the environment in which the assessment is made. In line with this reasoning, the percentage of subjects classified as aware was much higher (63% vs. 29%) in the experiment in which the students evaluated their moods repeatedly than in the otherwise identical experiment in which moods were rated infrequently.

Though it appears that awareness of an affect/environment connection helps determine whether autobiographical memories coincide or contrast with a person's current mood, exactly how and why this happens remains to be explained. The search for a theory would be aided by answers to a host of novel questions. For instance, what role does affect/

environment awareness play in free association, self-judgment, person perception, and other social cognitive tasks that, like autobiographical memory, are known to be highly sensitive to mood effects? Also, is there a theoretically meaningful nexus between the concept of awareness, as it applies to mood congruence, and its applicability to other aspects of social cognition, including the influence of explicit versus implicit attitudes on behavior (Greenwald and Banaji, 1995; Greenwald et al., 2002) and the conscious versus nonconscious priming of stereotypes (Bargh and Chartrand, 1999; Bargh and Ferguson, 2000)? And is affect/environment awareness relevant not only to mood-congruent memory, but to mood-dependent memory as well (Eich and Macaulay, 2006)?

This concludes our brief look at the concept of mood congruence and of some of the ways in which affective states influence cognition in general and memory in particular. Now we turn attention from memory 'in' affect to memory 'about' affect, and take up the complex, challenging, and controversial matter of memory for traumatic events.

2.15.2 Memory about Affect

The effects of emotion on memory for personal events is one of the most controversial issues in all contemporary cognition/emotion research. This issue has been studied in different contexts, and in every case the only conclusion upon which everyone agrees is that the impact of emotion on memory is an extremely contentious topic. For example, in research investigating flashbulb memories for salient news events, some have proposed that emotion enhances event recollection (Conway, 1995), whereas others have argued that flashbulb memories are not especially accurate (McCloskey et al., 1988; Neisser and Harsch, 1992). Similarly, in studies involving eyewitness memory, whereas some have claimed that emotion promotes eyewitness performance (Yuille and Cutshall, 1986), others have maintained that emotion impairs eyewitness memory (Loftus and Burns, 1982). While discussion of the role of emotion has been contentious in both the domains of news events and eyewitness memory (for a review, see Schooler and Eich, 2000), in no domain are the paradoxical claims regarding the effects of emotion on memory more evident than in the territory of trauma. The remainder of the chapter will focus on memory for traumatic events.

2.15.2.1 The Memory Wars

How people remember and forget trauma has been among the most polarized, controversial debates in the history of psychology and psychiatry (Loftus, 1997; McNally, 2003). Especially bitter has been the controversy regarding the authenticity of reportedly repressed and recovered memories of childhood sexual abuse (CSA). This controversy has sometimes been dubbed the memory wars (Crews, 1995; Schacter, 1995).

Some scholars believe that the mind protects itself by repressing or dissociating traumatic events from awareness, making it difficult for victims to remember their most horrible experiences until many years later. As Brown et al. (1998: 97) have argued, “when emotional material reaches the point of being traumatic in intensity – something that cannot be replicated in artificial laboratories – in a certain subpopulation of individuals, material that is too intense may not be able to be consciously processed and so may become unconscious and amnesic.” Conversely, many psychologists hold that abuse, combat, and other overwhelmingly horrifying events are ostensibly imprinted in memory and are seldom, if ever, truly forgotten (Pope et al., 1999; McNally, 2003; Kihlstrom, 2004). For example, Roediger and Bergman (1998: 1095) remarked that it is “mysterious how painful events, banished to an unconscious state for years through mechanisms of dissociation or repression, could be brought back to consciousness and recollected with great fidelity.”

Additionally, skeptics have warned that memories may be susceptible to distortions (Schacter, 1999) and that therapeutic interventions such as hypnosis, dream interpretation, and imagination – intended to recover memories of CSA – may unintentionally foster pseudo-memories of CSA (Loftus, 1993; Lindsay and Read, 1994). Thus, McNally (2005: 815) maintained that “the movement to help survivors recall these allegedly repressed memories resulted in the worst catastrophe to befall the mental health field since the lobotomy era.”

2.15.2.2 Remembering and Forgetting Trauma

Since the onset of the memory wars, a multitude of studies have addressed whether traumatic memories can be forgotten. A number of retrospective and prospective studies of CSA have found a nontrivial proportion of victims saying that they at some point in their life had not remembered their abuse. For

example, in one of the most widely cited retrospective studies, Briere and Conte (1993: 24) asked 450 patients in treatment for CSA the following question: “During the period of time between when the first forced sexual experience happened and your eighteenth birthday, was there a time when you could not remember the forced sexual experience?” Fifty-nine percent of the patients answered that there had been such a time. Accordingly, Briere and Conte concluded that a substantial number of survivors experience sexual abuse-related repression of their traumatic memories prior to recovering the memories later in life.

However, due to methodological limitations, this study cannot be taken as support for massive repression. First, participants in the study were patients possibly exposed to therapeutic techniques likely to foster memories of abuse (Poole et al., 1995). Also, as in many studies in this domain, it was not established whether the recalled abuse had actually happened. Moreover, the duration of amnesia for trauma was unspecified. Perhaps the most important issue concerns the question that respondents were given. In a way, this question was formulated in an ambiguous way. Thus, McNally and colleagues pointed out that participants were more likely answering a different question: “Was there ever a time that you did not think about having been abused?” (McNally et al., 2004: 131). That is why an affirmative answer to this question does not necessarily provide solid evidence for the type of massive repression put forward by CSA researchers. Instead, such a positive reaction might simply mean that those who experienced CSA can sometimes manage not to think about the abuse. These and other critical points have also been made with regard to similar retrospective studies published in the last 15 years.

A much smaller number of studies have used a prospective methodology to assess whether traumatic events can be forgotten. In an influential study by Williams (1994), 129 women with previously documented histories of CSA were interviewed. Of these, 38% failed to report the index event of abuse for which Williams had a record. Some authors have interpreted these data as showing that massive forgetting of trauma is not only possible, but even very common. However, there are several other, more likely explanations. A majority of the participants, 68%, who had apparently forgotten the index event of abuse did report other abuse events, suggesting that the index event may have merely been less traumatic or less important to them than other

instances of CSA. Given that several women had been abused when they were younger than 5, not remembering the abuse might be the result of childhood amnesia. Moreover, one can argue that the younger the child at the time of the index event, the more likely she is to fail to understand the abuse as sexual at the time. Also, other women may not have wanted to label themselves as abused and/or disclose such personal matters to the interviewer. Thus, a failure to disclose cannot be regarded as evidence of repression (Loftus et al., 1994).

A study by Goodman and colleagues (2003) provides further data on failure to disclose abuse. They assessed 168 persons who had been involved in legal proceedings concerning sexual abuse. These proceedings occurred when the persons were approximately 9 years old. A survey was administered 13 years after the persons had been involved in the legal proceedings. Questions about sexual abuse were inserted in a longer survey concerning legal attitudes and experiences. Results revealed that about 16% failed to report the target incident during a telephone interview conducted approximately 13 years after the events in question. Nondisclosure dropped to 8% after follow-up by a mailed questionnaire and a telephone interview. Moreover, an in-depth analysis by Goodman and Paz-Alonso (2006) yielded a reduced estimate of 4% for the incidence of traumatic amnesia. As these studies indicate, claims of widespread repression and recovery of childhood abuse have been exaggerated. Accordingly, Goodman et al. (2003) concluded that the findings, rather than supporting the existence of special memory mechanisms unique to traumatic events, instead imply that normal cognitive operations underlie long-term memory for CSA.

2.15.2.3 False and Recovered Memories

Another possibility for the impression that one has harbored repressed memories is that a failure to remember traumatic events took place because such events did not actually occur in the first place (Loftus, 1998). On first impression, the idea that someone might remember having experienced a trauma that never took place seems an unlikely account for repression. Yet, people have recollected atrocities that never happened and have been experiencing the emotional pain paralleled with their belief in the authenticity of their memories. Some of the improbable traumatic events for which people claim to have recovered memories in recent years involve

satanic ritual abuse (Scott, 2001) and abduction by space aliens (Mack, 1994; Clancy, 2005), memories which are occasionally 'recovered' during psychotherapy. In reviewing the influence of psychotherapy, Lindsay and Read (1994: 304) concluded that "there are good reasons to believe that: (1) some recollections produced by intensive memory recovery may be false; and (2) when such techniques are used it is very difficult to discriminate between clients who are remembering accurately and clients who believe they are remembering accurately but are not."

The fact that a growing number of former patients have retracted their claims of CSA also suggests that false CSA memories can be induced by therapists. Most retractor cases involve adults who had sought psychotherapy for depression or related complaints. During therapy, memories of CSA were recovered. However, later patients come to believe that the 'recovered memories' were only products of therapeutic suggestion (e.g., Ost et al., 2002).

In the 1990s, the experimental research community responded in earnest to these frequent memory reports by patients claiming their experiences had been previously repressed. If these memories were not authentic, where could they have come from? If they were false, how could they develop? With these questions in mind, several lines of research on the development of false beliefs and memories began to flourish (for reviews, see Laney and Loftus, 2005; Smeets et al., 2005). One of the best-known tasks that has been strikingly successful in creating pseudo-memories in the laboratory is the Deese-Roediger-McDermott (DRM) paradigm (Deese, 1959; Roediger and McDermott, 1995). In this task, participants often falsely recall and recognize a nonpresented word or critical lure (such as 'sleep') following presentation of several of its strongest associates ('bed, rest, awake, tired,' and the like).

The DRM paradigm relies on semantic material. Yet, apart from semantic material, research has demonstrated that techniques such as imagination inflation (Garry et al., 1996), dream interpretation (Mazzoni et al., 1999), and suggestions containing incorrect feedback (Crombag et al., 1996; Hyman and Billings, 1998; Jelicic et al., 2006) may create false beliefs and pseudo-memories. Moreover, recent studies have successfully employed doctored photographs (e.g., a youngster riding in a hot-air balloon) to suggest childhood events that never happened to the child or adult participants (Wade et al., 2002). Additionally, studies have shown that experimental

manipulations intended to implant pseudo-memories may have overt behavioral consequences (Bernstein et al., 2005).

2.15.2.4 Recovered Memories in the Laboratory

Remarkably, until recently no studies had been conducted on the cognitive functioning of people in the center of this recovered-memory debate: those who report repressed and recovered CSA memories. This state of affairs could be due to the fact that few clinicians have expertise in laboratory research and few cognitive psychologists have access to trauma populations (McNally et al., 2004). In fact, Richard McNally and Susan Clancy of Harvard University were the first to apply experimental methods to investigate memory functioning in people reporting repressed and recovered memories of CSA. By doing so, their studies have tested hypotheses relevant to mechanisms implicated in the ability to repress and recover traumatic memories, as well as mechanisms relevant to forming pseudo-memories of trauma (McNally, 2003). For example, they examined whether individuals reporting recovered CSA memories are more prone to false memory effects induced in the laboratory (Clancy et al., 2000). In one of their studies, they used the previously described DRM paradigm to show that, relative to individuals with continuous memories and controls with no history of abuse, individuals reporting recovered CSA memories more often falsely recognized the nonpresented critical lures. Subsequently, these findings were extended to trauma-related material (Geraerts et al., 2005). That is, besides neutral DRM lists (e.g., critical lure 'sleep'), trauma-related lists (e.g., critical lure 'assault') were employed. It was found that individuals reporting recovered abuse memories are more prone to falsely recalling and recognizing neutral and trauma-related words that were never presented.

Several researchers have argued that such susceptibility to false memories may be due to a source-monitoring deficit, that is, incorrect judgments about the origin or source of information (Johnson et al., 1993). For example, subjects may think of the nonpresented lure at study, so then at test they must differentiate between memories of internally generated thoughts versus memories of the studied words. Results reported by Clancy et al. (2000) and by Geraerts et al. (2005) suggest that individuals reporting recovered CSA memories may

have a source-monitoring deficit for all types of material, whether the content is neutral or trauma-related. It can be speculated that these individuals have a tendency to adopt an internally generated thought as being a genuine memory. This could have important implications, both in terms of the development of false memories *per se* and in terms of the development of mistaken beliefs. Thus it may be that a subsample of those with recovered memories developed false memories via a subtle interaction between intrinsic source-monitoring difficulties and suggestive therapeutic techniques.

2.15.2.5 Underestimation of Prior Remembering

Although the research above suggests that recovered memories are likely to be false memories, Schooler and coworkers (e.g., Schooler et al., 1997; Shobe and Schooler, 2001) described several case studies of individuals who experienced the discovery of apparently long-forgotten memories of abuse, memories for which corroborative information could be found. Interestingly, in two of the cases the partners of the women who reported full-blown recovered-memory experiences said that the women had talked about the abuse before they had the recovered-memory experience. In both cases, the women seemed to be surprised to discover that they had talked about the abuse prior to their recovered-memory experiences. Schooler and colleagues proposed that these cases illustrate a forgot-it-all-along (FIA) phenomenon, which at its core entails the underestimation of prior recollections of past events.

Recent studies have provided elegant laboratory analogs of this FIA phenomenon. For example, a series of experiments by Arnold and Lindsay (2002, 2005) required participants to recall material in qualitatively similar versus different ways on two occasions. They argued that if the retrieval of CSA memories in qualitatively different ways can lead to the underestimation of previous CSA recollections, then this mechanism should transfer into the lab. In the basic procedure, participants studied a list of homographic target words, each accompanied by a biasing context word (e.g., hand: PALM). In Test 1, participants were tested on a subset of the study list, with some of the target items being cued with the studied-context word (e.g., hand: P-M) and the rest of the items cued with another-context word (e.g., tree: P-M). In the final test, participants were tested on all of the studied items, and the studied-

context cues were always given as recall prompts. Additionally, after recalling each word, participants were required to judge whether they had recalled that word on Test 1. The key result was that participants more often forgot their prior recall of the words when they had been cued with the other-context cue than with the studied-context cue on Test 1. Hence, these results provided compelling evidence that remembering a past event in a different way can result in a failure to remember a prior instance of recalling that event.

Recently, the link between the FIA effect and recovered memories has been studied in the laboratory by Geraerts et al. (2006). The issue of interest was whether individuals reporting recovered CSA memories are more prone to underestimating their prior remembering, relative to individuals with continuous CSA memories and controls reporting no history of abuse. Using Arnold and Lindsay's (2002) FIA test, Geraerts et al. (2006) found that participants with recovered CSA memories were found to be more prone to forget that they had previously recalled a studied item when they had been cued to think of it differently on two recall tests. That is, the FIA effect was larger in those who reported recovered memories.

In a related study, Geraerts et al. (2006) asked participants to recall autobiographical events (e.g., being home alone as a child) in an emotionally negative or positive framing across three test sessions over a period of 4 months. Given the cue 'being home alone as a child,' for example, a participant assigned a positive framing for that event might recall enjoying the feeling of freedom of having the house to himself/herself; the same participant assigned a negative framing for that event in session 2 might reminisce about feeling lonely after a while.

In the first session, participants were instructed to recall 25 selected events in either a positive or negative frame. After 2 months, participants were asked to recall 16 of the target events a second time. For half of the trials, the framing cue presented with the events corresponded to the negative/positive framing cue presented with the autobiographical events during the first session, whereas for the remaining trials the framing was the opposite from the framing cue presented in the first session (i.e., positive framing if the framing on the first session had been negative, and vice versa). In session 3, again 2 months later, participants were tested on all the target events, accompanied by the framing cues that were presented with the targets during session 1. Again,

individuals reporting recovered CSA memories showed an enhanced FIA effect relative to individuals with continuous abuse memories and controls, even when mildly emotional autobiographical material was used over a period of 4 months, conditions that more closely mirror everyday life (if not memories of trauma). These findings imply that some of the participants' recovered CSA memories may be fundamentally accurate, but that these individuals may have underestimated their prior memories for the abuse.

2.15.2.6 Discovered or False Memories?

The two basic findings discussed above – source monitoring deficits and the FIA effect – suggest radically different interpretations of recovered memories. On the one hand, studies by Clancy et al. (2000) and Geraerts et al. (2005) show that reports of recovered memories are associated with false memory effects as measured by the DRM task. Conversely, the results reported by Geraerts et al. (2006) indicate that recovered memory reports are intimately related to underestimation of prior remembering. However, it seems implausible that one and the same report of a recovered memory could be linked both to false memory effects and to the underestimation of prior remembering. How can these phenomena be integrated? Careful inspection of the precise types of recovered memory experiences may provide an answer to this question.

Two clearly distinguishable types of recovered memory experiences have been documented in the literature (e.g., Shobe and Schooler, 2001). In one type, people come to believe that they are abuse survivors, commonly attributing their current life difficulties to their repressed memories of abuse. Here, abuse events tend to be recalled gradually over time, often by suggestions of a therapist. People usually indicate that they have 'learned' (e.g., through hypnosis) that the abuse occurred to them. In the other type of recovered memory experience, people are suddenly reminded of events they believe they had not thought about for many years. They are shocked and surprised by their recollection, but not by the content of the memory as such. This kind of recollection differs from the one in which the person is gradually recalling the abuse, often in the course of therapy. For this reason, Schooler and coworkers (Schooler et al., 1997; Schooler, 2001) referred to these suddenly recovered memories as discovered memories, reflecting situations "in which

individuals sincerely perceive themselves to have discovered memories of experiences of which they think they had previously been unaware" (Shobe and Schooler, 2001: 100). This term keeps open the possibility that individuals could have discovery experiences corresponding to memories that were not completely forgotten.

Given these two types of recovered-memory experiences, it is not too farfetched to speculate that people who report CSA memories recovered during therapy may score high on tasks yielding false memory effects, like the DRM task. Yet, they may perform similarly to control participants on tasks tapping the FIA effect. Conversely, one would expect that people with spontaneously recovered memories would be especially prone to the FIA effect, whereas they would score similarly to controls on false memory tasks, such as the DRM. Preliminary analyses of the data collected in several studies with individuals reporting recovered CSA memories indicate that this is the case (Geraerts, 2006).

2.15.2.7 Corroborative Evidence of Abuse

Recent research supports the view that CSA memories discovered outside of therapy are more likely to reflect genuine events relative to memories recovered in therapy (Geraerts et al., 2007b). In this study, people with recovered CSA memories responded to an extensive memory questionnaire. Participants were asked to characterize their prior degree of forgetting, the quality of their memory recovery if they had one, the nature and context of the abuse, and the qualities of their current memory. Moreover, information was sought to verify or corroborate the CSA memories. Memories were characterized as corroborated if one or more of the following three criteria were met: (a) another individual reported learning about the abuse soon (i.e., within the next week) after it occurred, (b) another individual reported having also been abused by the alleged perpetrator, or (c) another individual reported having committed the abuse him/herself. The presence of corroborative evidence was evaluated by two raters blind to any additional information associated with each case.

Results revealed that memories recovered unexpectedly, outside of therapy, were significantly more verifiable than memories that were reported to have been gradually recovered within the context of therapy. As indicated in **Table 1**, abuse events

Table 1 Percentage of memories of childhood sexual abuse that could or could not be corroborated

Participant group	Corroboration	
	Yes	No
Continuous recollection	45% (32)	55% (39)
Recovered out of therapy	37% (15)	63% (26)
Recovered in therapy	0% (0)	100% (16)

Number of participants per condition is enclosed in parentheses. Source: Geraerts E, Schooler JW, Merckelbach H, Jellic M, Hauer BJA, and Ambadar Z (2007b) The reality of recovered memories: Corroborating continuous and discontinuous memories of childhood sexual abuse. *Psychol. Sci.* 18: 564–568; used with permission from Blackwell Publishing.

recovered during therapy could not be verified, while 37% of the CSA memories discovered outside of therapy were independently corroborated; the latter figure is similar to the 45% verification rate found for continuously accessible memories. These results support the view that memories recovered unexpectedly outside of therapy (i.e., discovered memories) are more likely to correspond to genuine abuse events, relative to memories recovered in therapy.

Moreover, in this study, 85% of participants reporting recovered memories failed to appreciate their abuse as traumatic at the time it occurred, in part due to lack of understanding the nature of the event (for related results, see Clancy and McNally, in press). In fact, many of them rated the abuse as being more traumatic now than it was at the time of the abuse. This was especially the case for participants who suddenly recalled long forgotten and often corroborated episodes of abuse. Several of them were exposed to one or sometimes more episodes of abuse that were nonpenetrative (e.g., fondling). Such events were experienced as confusing or distressing but not essentially frightening. Individuals reporting them might have managed not to think about these experiences, particularly if retrieval cues were absent (e.g., in cases in which the victim or the perpetrator had moved away). Years later, appropriate retrieval cues might be encountered, triggering the recollection of the long-forgotten abuse experiences, which the person now correctly understands to be sexual abuse. This realization often is accompanied by an onrush of emotions which is interpreted as the impact of remembering something for the first time.

Although such cases undoubtedly qualify as recovered/discovered memories of sexual abuse,

they cannot be taken as evidence for amnesia. Contrary to the standard view of repression, people do not forget their abuse in the strict sense of the word, because the abuse was neither perceived as traumatic nor recognized as abuse. No special mechanisms, such as repression or dissociation, have to be put forward to clarify why these misapprehended abuse experiences did not come to mind for many years. Also, no special mechanisms such as repression are needed to explain reports of CSA memories recovered during therapy. Memories recovered during therapy, as well as discovered memories, both render a scenario in which a false impression of previous nonavailability of abuse memories arises, while in fact, no special mechanisms such as dissociation or repression are needed to account for these impressions of repression.

2.15.2.8 Mechanisms of Traumatic Memory

Does traumatic memory involve special mechanisms? According to one popular view known as the trauma-memory argument, memories of traumatic events have special properties that distinguish them from ordinary memories (for a critical discussion, see [Kihlstrom, 1996](#)). In this view, traumatic memories are qualitatively different (i.e., processed and stored differently) from other types of memories, thereby involving mechanisms different from those associated with general memory functioning ([van der Kolk, 1996](#)). This view asserts that many survivors of a trauma invoke mechanisms such as repression and dissociation, which result in dissociative amnesia for the stressful event itself. Moreover, it is contended that survivors of a trauma suffer from intrusions with strong sensory qualities. This dissociative style of processing would also create a substantial overlap between dissociative and posttraumatic stress disorder symptoms. There are several versions of this theoretical stance ([Brewin et al., 1996](#); [Ehlers and Clark, 2000](#)), but the core assumption they have in common is that trauma has a special impact on the way in which memories of the traumatic event are organized (for discussions, see [Kihlstrom, 1996](#); [Shobe and Kihlstrom, 1997](#); [Kihlstrom, 2006](#); for a reply, see [Nadel and Jacobs, 1998](#)).

Although the trauma-memory argument has gained popularity among many clinicians, some findings argue against this view. Systematic studies suggest that only a small minority of war victims report dissociative amnesia. For example, [Kuch and Cox \(1992\)](#) studied 124 Holocaust survivors and found

that dissociative amnesia, with an estimated lifetime prevalence rate of 3%, was quite rare in this group. Likewise, [Merckelbach and colleagues \(Merckelbach et al., 2003\)](#) found in a group of 29 Dutch concentration camp survivors only one survivor reporting mnemonic experiences that might be taken as evidence for dissociative amnesia. The authors noted that in this case there was a serious possibility that drug abuse contributed to the poor memory of the traumatic episode. Similarly, [Geraerts and colleagues \(Geraerts et al., 2007a\)](#) found that in a sample of Croatian war veterans who had been confronted with extremely aversive events during the Balkan wars, dissociative amnesia was rarely reported. In sum, several recent findings do not support the existence of special memory mechanisms that are unique to traumatic events.

2.15.3 Integrating Memory in and about Affect

In the preceding pages, we have treated memory in and about affect as distinct topics. Such a treatment was possible because research on mood-congruent cognition has had relatively little overlap with research on memory for traumatic events. Nevertheless, consideration of these topics together invites exploration of the possible empirical and theoretical issues that might unite them. To this end, we close with a discussion of potential ways in which the principles and findings of mood congruence might apply to understanding the processes leading to reports of recovered memories of trauma.

2.15.3.1 Connections between Mood Congruence and Traumatic Memory

According to the AIM, the motivational and resource demands of the situation determine which of two distinct processes – affect priming or AAI – mediate mood-congruent effects. Given the variable conditions under which individuals can think about traumatic experiences, it seems likely that each of these processes might influence recovered memory reports under different circumstances.

2.15.3.1.1 Affect priming

When individuals are highly motivated, have sufficient resources, and are elaborating on self-relevant information, they are likely to experience affective

infusion, whereby the information that is generated/attended to is shaped in accordance with the present mood, presumably through a process of affect priming. When individuals are in therapy they are talking about issues of immense self-relevance. They experience powerful emotions. They are highly motivated to think through their experiences. And with the therapists' support, they are likely to have adequate resources to engage in elaborative systematic processing. Thus therapy potentially provides an extremely fertile ground for the priming of affect-related memories, thoughts, perceptions, and other cognitive constructions. From this perspective, it seems possible that affect priming, when combined with a therapist's suggestions, could spawn false memories. For example, if therapy invokes emotions of betrayal and trauma, then affective infusion might facilitate the adoption of suggested memories that are consistent with those emotions.

Admittedly, negative emotional states can minimize susceptibility to suggestion, whereas the above characterization proposes that therapy-induced negative emotions might enhance suggestibility. Importantly, however, the reduced susceptibility to misinformation reviewed in this chapter involved minor details of little self-relevance, and not in accord with the induced negative affect participants were experiencing. In contrast, therapy-suggested experiences of abuse would be highly self-relevant and likely in accord with the emotional state that the patient is experiencing at the time. Thus, in the context of therapy, the capacity for affect priming to generate affectively matched cognitions may outweigh the capacity for negative emotions to reduce suggestibility, thereby leading to a net increase in false memories.

Though speculative, the suggestion that affect priming could be a source of therapy-induced false memories might be empirically explored by examining whether the match between an affective state and a memory suggestion affects the generation of false memories. For example, in the imagination inflation paradigm (Garry et al., 1996), imagining events, such as putting one's hand through a window or finding a 10-dollar bill, increases the perceived likelihood that these events occurred. If affect priming enhances false memories in therapy, then it seems likely that imagination inflation might similarly be associated with affect-infusion (or mood-congruent) effects. Accordingly, participants may be more likely to believe they had once found a 10-dollar bill if they imagine this in a good mood, or more likely to believe they put their hand through a

window, if they imagine this in a bad mood. Such a findings would suggest that affect priming could be an even greater source of false memories in the substantially more emotional and self-relevant context of therapy.

2.15.3.1.2 *Affect-as-information*

In the secure atmosphere of therapy, individuals are likely to have the resources to think about traumatic experiences using elaborative systematic processing. However, when memories of abuse arise unbidden and out of therapy, the emotional onrush can be overwhelming. Individuals reporting memory discoveries outside of therapy describe their experience with terms such as stunned, chaos in my emotions, overwhelmed, and like a ton of bricks just hit me (Schooler, 2001).

According to the AIM, in a situation in which cognitive resources are overwhelmed by emotion, it is likely that AAI processes would take place. In keeping with this view, Schooler (2001) speculated that AAI may lead individuals to infer, based on their profound affective experience of discovery, that they must be remembering the abuse for the first time. According to this discovery misattribution account, individuals confuse the emotion associated with discovering a new interpretation of the experience with that of discovering the memory itself.

Several strands of evidence support a discovery misattribution account whereby individuals use the affect associated with discovering a new understanding of their experience to falsely infer that they have discovered a forgotten memory. First, both of the original cases of misconstrued forgetting involved individuals who reported experiencing an overwhelming onrush of emotion after reinterpreting their abuse experiences (Schooler, 2001). For example, one case involved a woman who reported having been raped while hitchhiking. In her recounting of her memory, she reported that originally she had thought of the experience as a sexual experience gone awry, indicating that she had "made such a mess of it . . . by resisting what I thought was supposed to be a sexual experience" (Schooler, 2001: 120). However, following the onrush of emotions associated with her memory discovery, she reported thinking "my God . . . I had been raped! . . . that's a crime! I was 16, just a kid" (Schooler, 2001: 121). Similarly, in the large-scale corroborative effort by Geraerts et al. (2006), change in interpretation was

one of the best predictors of memories being characterized as previously forgotten.

Laboratory research also provides evidence for discovery misattribution. For example, the experience of discovering the solution to an anagram can be confused with the experience of remembering having seen the word corresponding to the anagram's solution (S. Dougal and J. W. Schooler, unpublished observations). Together these strands of evidence suggest that the reduced resources associated with the emotional onrush of realizing that one was the victim of abuse, could enable an AAI process whereby individuals misattribute the emotion of discovering a new understanding of the event to that of discovering the memory itself.

2.15.3.2 Final Thought

Memory research has come a long way since the time that it shunned emotion. Our review of the role of emotion in and about memory reveals that there is much that simply could not have been known about memory, were memory researchers to have remained limited to the random-word-list paradigms that were the bread-and-butter of memory experiments for so many years. Not only did such paradigms lack the emotional manipulations that have proven to be so informative, but by ignoring elaboration and self-relevance, these procedures were inherently insensitive to many of the consequences of affect. Moreover, understanding memory for emotional events necessarily requires researchers to leave the confines of their laboratories and explore the far more complex situations in which traumatic memories actually take place.

Nevertheless, consideration of the relations between traumatic-memory reports and performance on basic word-list paradigms has yielded critical insights into the processes underlying the formation of recovered-memory reports. Thus, while memory in and about affect illustrates just how far memory research has come, its also illuminates the value of remembering its roots.

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