

**Psychological Concepts  
and  
Dissociative Disorders**

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## 7 Temporary Emotional States Act Like Multiple Personalities

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In this chapter, I report on my research on how variations in people's temporary mood states influence their memory, thoughts, judgments, and self-image. All of my studies use normal adults, usually college students; however, I try to relate my findings to clinical phenomena of dissociation and multiple personality. I have no personal knowledge of multiple personality patients. What I know of the disorder I have learned from watching Joanne Woodward's acting in "The Three Faces of Eve" and from reading about it. For example, I've learned that 92% of multiples are women, that 97% report having suffered through a history of childhood incest, torture, trauma, or other abuse in a disturbed family, and that patients are typically very hypnotizable, suggesting a genetic predisposition towards dissociation (Kluft, 1984).

I've also learned that the four major theories of multiple personalities are:

1. that it reflects a series of self-hypnosis episodes (Bliss, 1980);
- or
2. it reflects the deep involvement of the patients in enacting multiple social roles that enable them to cope with warded-off

impulses and conflicts, with the role-playing encouraged and legitimated by the therapist (Spanos, Weekes, & Bertrand, 1985); or

3. it is caused by epileptiform activity in the temporal lobe and the limbic system (Schenk & Bear, 1981); or
4. it reflects a coherent series of state-dependent memory phenomena (Braun, 1984; Kluff, 1984).

It is with this latter theory that I am most at home. I have conducted experimental studies of state-dependent memory, and I review herein those most relevant to multiple personalities.

For most of my professional life, I have studied human memory. For a memory theorist, the clinical phenomena of memory dissociation is wondrous, magical, and utterly incredible—the stuff of dreams and dramas. State-dependent memory shares some of that same mystery and allure: A person learns something in one psycho-neuro-physiological state, is unable to retrieve it while in a different state, yet can recover it later if the original state is reintroduced. When I began my studies in the late 1970s, I knew about the experiments showing a kind of state-dependent learning in rats when they were given different drugs such as alcohol, phenobarbital, or amphetamine. But the work on drug-state dependent memory in humans was sparse, and yielded inconsistent and inconclusive results. I wanted to see whether we could produce state-dependent memory using different emotions or moods, such as happiness, sadness, fear, or anger. And so we began our experiments.

A first successful demonstration of mood-state dependent memory was carried out in 1977 by me and my student, Stephen Gilligan (see Bower, Monteiro, & Gilligan, 1978). To induce the mood-states, we used hypnosis: We first selected highly hypnotizable college students; then, during the experiment, we hypnotized them and suggested that they get themselves into happy moods by recalling and reliving in imagination happy experiences from their lives. After 2 or 3 minutes of this mood induction, we had them memorize a list of 16 unrelated words for about 6 minutes while they continued to

feel happy. The words would be read to them and then the subjects would try to recall them, in any order they could; this went on for several trials.

We then had the subjects switch moods, asking them to feel sad by reliving some episodes from their lives when they had felt sad. We told them to not get themselves too overwhelmingly sad, because we wanted them functional for our experiment. As they continued to feel sad, they memorized a second list of words for several minutes.

I've described a condition in which subjects learned a first word list while happy and a second list while sad. Other subjects learned the lists in the reverse mood order—first sad, then happy. We then had the subjects rest and read a book for 20 minutes to cause some forgetting. We then hypnotized them again, placed half in a sad mood, half in a happy mood, and asked them to recall both lists of words they had learned earlier.

The results are shown in Fig. 7.1 giving the average percentage of words from each list that the subjects retained and could recall later. We see here a strong mood-dependency: People who were tested when they were happy recalled more of the list they had learned when they were happy; people who were sad when tested recalled more of the list they had learned when they were sad. This is due to mood matching: If the mood during retrieval matches that during learning, then the memories are far more available than if the two moods mismatch. In this experiment, it was not important whether subjects were happy or sad during learning or during testing; what was important was the matching between the input state and the output state. It is that matching that causes state-dependent memory.

The forgetting shown here is a kind of *dissociation* between memories learned in these two states. When people are sad, they have something like selective amnesia for events that happened to them earlier when they were happy. It is as though their memories have several different directories, much like directories in a computer database or different suburban telephone directories. The directories are compartmentalized according to the dominant mood, emotion,

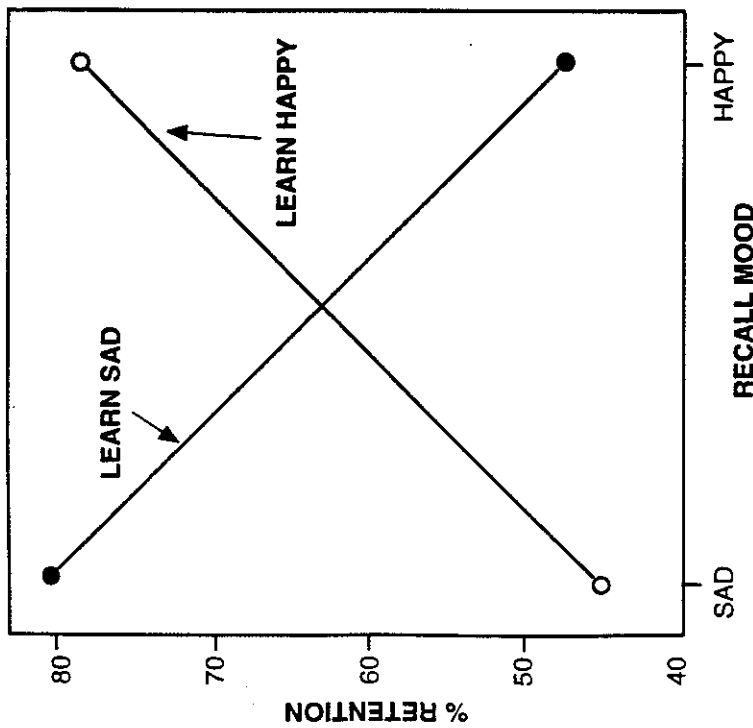


FIG. 7.1. Percent retention related to learning mood and recall mood (from Experiment 3 of Bower, Monteiro, & Gilligan, 1978; reprinted by permission).

or thematic relationship that prevailed during the original experiences. A given memory directory can be easily entered and its information accessed only by the person re-entering the corresponding emotional state. Obviously, these mood directories are similar to multiple personalities.

A follow-up experiment was carried out with another associate, Bret Thompson, who demonstrated state-dependency with four different emotions (cited in Bower, 1981). Our subjects were hypnotized and taught four different lists of words, each list under a different emotion—either joy, sadness, fear, or anger. After studying the four lists, subjects were tested for recall of them. Before each

recall, however, subjects were again put in one of the four moods. The testing moods were selected so that, across subjects, each of the four learning moods was tested in each of the four retention moods. The experiment was hard work for subjects and experimenter alike, but it illustrates the utility of hypnosis for altering emotional moods.

Figure 7.2 shows the percentage retention scores for a list learned in the mood shown in the row when it was tested in the mood shown in the column. The main diagonal is shaded and shows same-mood retention scores. These scores are the highest in each row: They are not 100%, of course, because much forgetting occurs in such experiments. The opposite-mood entries are circled, for these were expected to yield the poorest recall, and they do so in all four rows. The other entry in each row represents medium generalization of learning between the two opposites, and the percentage recall scores do appear to be intermediate between the shaded diagonal entries and the circled entries. In order to make the relationships clearer, I have averaged the retention scores for the three types of test condition. The average percentages are 0.85 for same-mood testing, 0.70 for

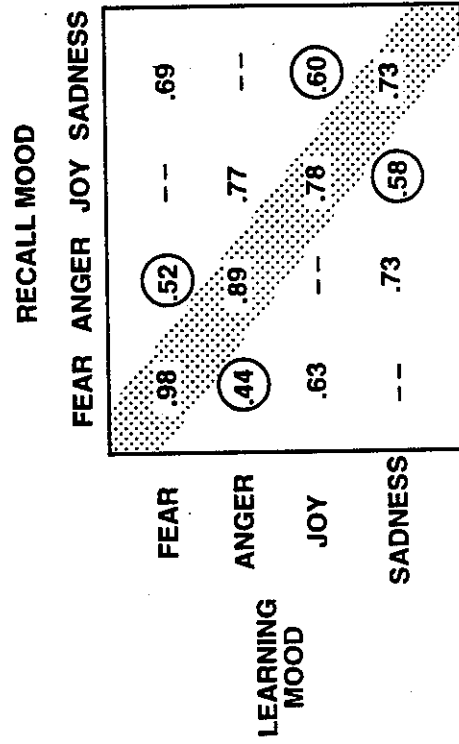


FIG. 7.2. Percent retention of items learned in the Row mood and tested in the Column mood. (Experiment by Thompson cited in Bower, 1981; reprinted by permission.)

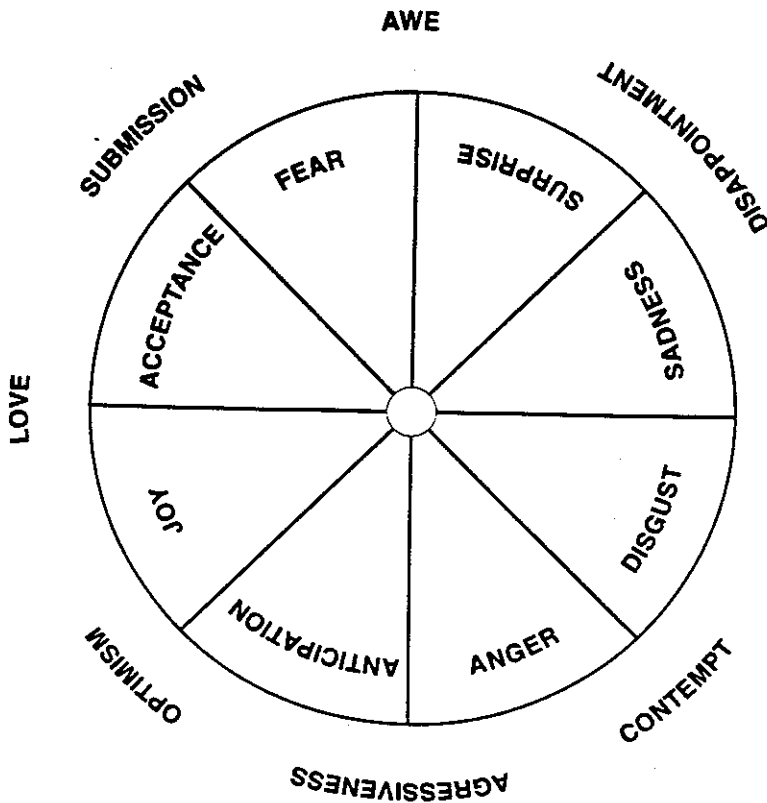


FIG. 7.3. Plutchik's theory of the similarity of eight primary emotions, listed inside the circle. Two emotions are more similar the closer they are around the circle. (From Plutchik, 1980, reprinted by permission.)

"intermediate mood" testing, and 0.54 for opposite-mood testing. These data appear to be consistent with a proposal by Robert Plutchik (1980) regarding the similarity of different emotions. Plutchik's proposal is summarized in Fig. 7.3, which shows his proposed eight primary emotions on the inner circle—joy, acceptance, fear, surprise, sadness, disgust, anger, and anticipation. The similarity of two emotions is reflected in how near they are around the edge of the circle. Thus, joy and sadness are distant

opposites, as are fear and anger, while anger and fear are half-way similar to sadness. This chart suggests that in multiple personalities, clinicians are more likely to observe amnesia between two personalities that display totally opposite emotional styles.

State dependency arises not only with such memories created in the laboratory, but also in people's memory for real-life events. In several experiments, subjects have been made happy or sad, and then asked to recall an unselected sample of memories from their past—in one experiment, to recall events from their childhood (see Bower, 1981); in another experiment, to recall events from the past few weeks. Mark Snyder and Phyllis White (1982) reported the results shown in Fig. 7.4: Their happy subjects recalled more happy events

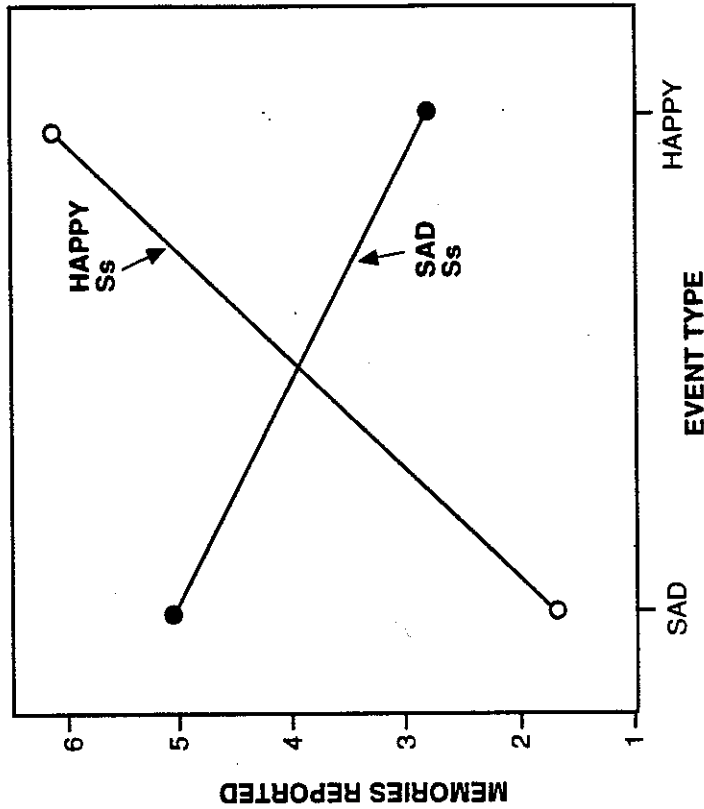


FIG 7.4. Number of memories of happy and sad events reported by subjects induced to feel happy or sad during the report. (Based on data reported by Snyder & White, 1982, adapted by permission.)

from their recent life, whereas sad subjects reported more sad events. This is a form of mood-dependent memory, because these people presumably felt appropriately happy or sad at the time these events originally occurred. One observes this sort of biased memory reporting, of course, from psychiatrically depressed patients or chronically anxious worriers.

Similar mood-dependent retrieval has been observed in manic-depressive patients who are cycling through different moods over days. Weingartner, Miller, and Murphy (1977) gave a series of memory tests to hospitalized manic-depressive patients whom they observed every 4 days over a period of many weeks that included many mood cycles. Figure 7.5 illustrates a hypothetical patient's mood swings over days. Every 4 days, at points marked A, B, C, and so forth, the patient's mood was assessed and he received two tests:

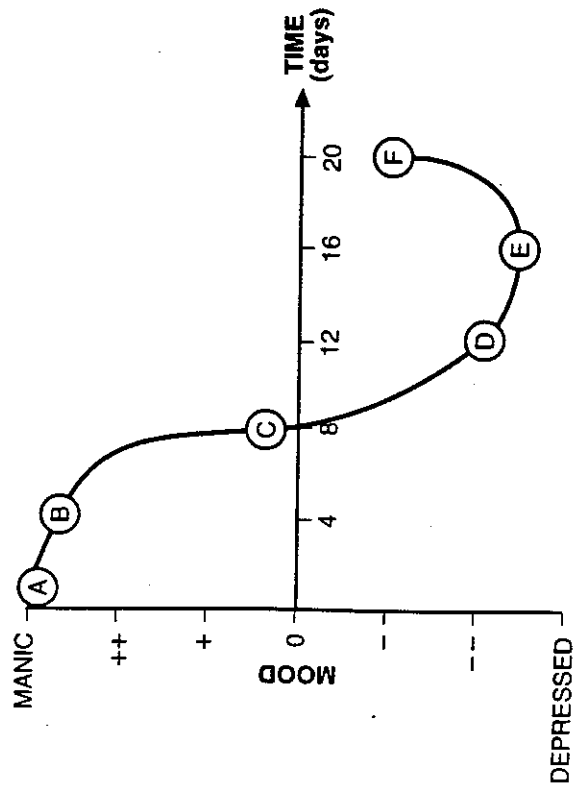


FIG. 7.5. Hypothetical mood fluctuations over 20 days of a manic-depressive patient. Every 4 days, at points marked A, B, C, D, E, and F, the patient's memory would be tested for material he or she had generated 4 days earlier. Based on a procedure developed by Weingartner, Miller, and Murphy (1977).

first, he generated 20 free associations to each of two novel stimulus words; then he tried to remember the 20 free associates he had given to two other stimulus words he had seen 4 days before. Thus, at point B, the patient would try to remember the words he had produced earlier at point A; and also at point B, he would generate new associates that he would have to remember when tested at point C; this procedure was repeated every 4 days.

The question is: How does the patient's memory for the previous session's associates relate to his change of mood? The results in Fig. 7.6 show that, as the mood changes more between one session and the next, the patient forgot more of the associates he had generated the previous session. Thus, in terms of Fig. 7.5, there

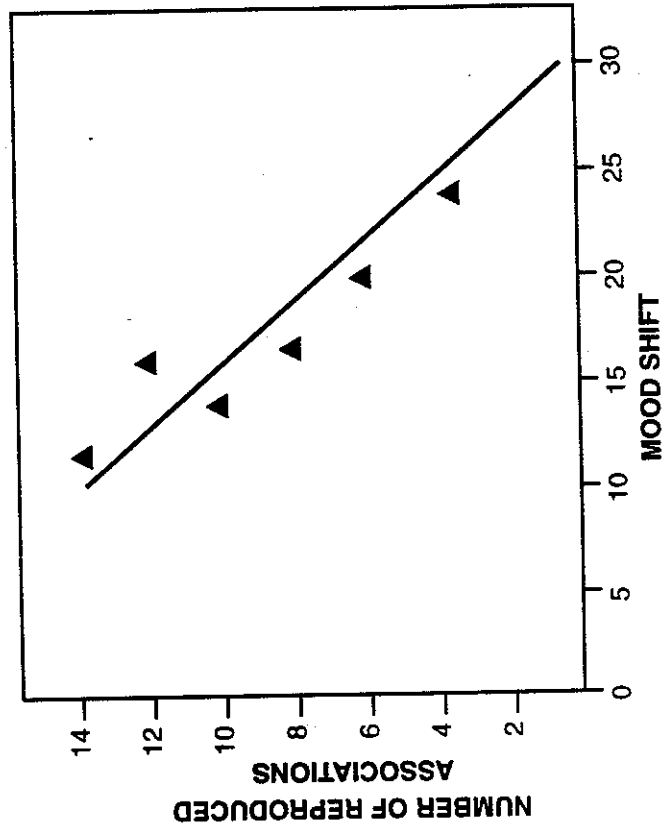


FIG. 7.6. The lower number of associations remembered as the patients' mood changed more between initial generation and the memory test. (From Weingartner, Murphy, & Sullivan, 1978, reprinted by permission.)

would have been little forgetting between days A and B, or D and E, but much forgetting between B and C, and C and D. So, the decreasing memory in Fig. 7.6 is exactly what we would expect from mood-state dependent memory.

I have heard that Dr. Edward Silberman of the National Institute of Mental Health has investigated state-dependent memory in multiple-personality patients. I have not seen his report, but I gather that he observed considerable dissociation in memory across the different personalities. In a secondary source (Institute of Noetic Sciences, 1985), he was quoted as having concluded that "different personality configurations associated with Multiple Personality Disorder may serve to provide contexts and stimulus markers for uniquely storing and retrieving previous experience in much the same way that a drug or mood state serves to mark experience" (p. 17).

Once one notices mood-state dependent memory, one begins to examine other phenomena from this perspective. For instance, let us look at state-dependent memory caused by certain drugs. It is an interesting fact that most of the drugs that produce state-dependent memory also produce radical shifts in mood. Successful state-dependent drugs are ones like marijuana, amphetamine, alcohol, diazepam, phenobarbital, and opiate derivatives, all of which are mood altering. In fact, it is because they do alter moods that they are frequently abused. Thus, we might guess that these drugs produce state-dependency because they change moods.

There is some suggestive evidence for this view. In two different experiments, one using amphetamine with depressed patients (see Weingartner, Murphy, & Stillman, 1978), another using alcohol with college students (Eich & Birnbaum, 1988), state-dependent forgetting turned out to be predicted not so much by the drug dose as by the change in subjective mood state reported by the subject when, in a double-blind experiment, he or she was given the drug or placebo. For example, subjects who learned a word list while drunk were tested without alcohol but were led to believe that they had received vodka in tonic water; those who reported greater subjective

feelings of intoxication recalled more of the items they had learned when drunk. Such results suggest that memory dissociations induced by centrally active drugs may often be achieving their effects by way of altering the person's mood.

The results reviewed have demonstrated mood-dependency for a variety of conditions—for different types of memories, autobiographic ones as well as laboratory-created memories, for different moods (anger, fear, sadness, happiness) that have been aroused in different ways—by hypnotic suggestions, by normal events like successes or failures, or fantasies and watching movies, by drugs, and by whatever biochemical changes underlie shifts in manic-depressive patients.

What kind of theory can explain these mood-dependent effects? My theory (Bower, 1981) explains things in terms of the person's current emotional state entering into association with on-going events. The basic idea is diagrammed in Fig. 7.7. An emotion—say, #3, sadness—is characterized by its connections to facial expressions,

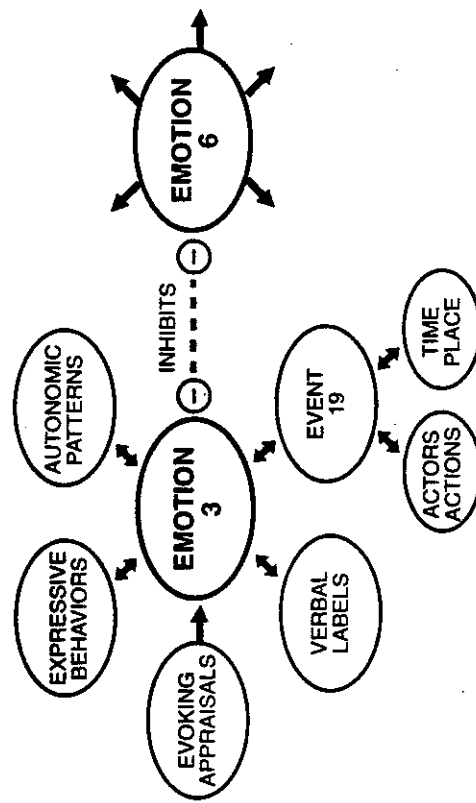


FIG. 7.7. Fragment of the associative network surrounding a specific emotion node, say, sadness for Emotion 3. Arrows indicate links along which activation can flow in either direction. (From Bower, 1981, reprinted by permission.)

to behavioral scripts and themes, to autonomic arousal patterns, and finally to ideas and memories of events that have occurred in association with that emotion.

When this emotion is aroused by whatever means, excitation or activation will spread out along its connections, turning on its physiological indicators and also priming and bringing into readiness these associated ideas and memories. Thus, when the person is sad and is asked to recall events from his or her childhood, that set of sad childhood memories will be receiving more total activation than others, so these sad memories become conscious and available for recall. Thus, individuals can better recall those events learned earlier when they were in the same mood.

Later experiments have added some amendments to this theory. For example, mood-dependent memory is not always found in such experiments, especially if the subjects' mood is *not* a salient part of their experience and they do not relate it to the on-going events (see Bower & Mayer, 1985, 1989). We have found that mood dependency is more probable if subjects see the to-be-learned events as *causing* their emotional reaction. If the emotion is seen as causally belonging to the on-going events, then a somewhat stronger associative bond seems to be formed between them, so that mood-dependent retrieval is more likely to follow. And this is the typical arrangement in real life: Life events that cause emotional reactions are the ones that are remembered in association with those emotions.

I now present several extensions of mood dependency. When emotions are strongly aroused, then the spreading of that activation will prime and bring into readiness associated concepts, themes, and rules for interpreting experience. Thus, emotional people will interpret their world and bias their judgments in a manner that is congruent with their feelings. Here is a list of some of these effects of spreading emotional activation:

- Free associations
- Themes of fantasies (T.A.T. stories)

- Snap judgments of other people
- Judgments of event likelihood
- Inter-personal judgments
- Self-perception
- Self-image

The first effect listed is that emotion influences our associative thinking, our reveries and fantasies. For example, happy or sad subjects give appropriately happy or sad free associations to words. When freely associating to a stimulus word like "life," the happy subject will say "wonderful, freedom, openness," whereas to "life" the depressed subject will say "death, misery, toil, struggle." That's understandable. A word like "life" has many associations, some pleasant, others not so pleasant. We theorize that our current emotional feeling stimulates into readiness certain ideas, so that words like "wonderful" and "freedom" receive the most activation from the stimulus word "life" when the person is happy, whereas "death" and "disaster" receive the most activation when the individual is sad.

Such word associations have been used to identify different multiple personalities. An early study of Eve White's three personalities was by psychologists Charles Osgood and Zella Luria (1954), who published a blind analysis of the semantic differential test given to Eve in each of her three different personalities. In that test, the patient rates along many dimensions the emotional connotation of certain key concepts such as "my mother, my spouse, myself, sex," and so on. Osgood and Luria came up with a surprisingly astute and accurate description of Eve's three personalities just by detailed analysis of the associations to such key concepts by Eve's three personalities. Thus, people's feelings alter the associations and emotional connotations aroused by key concepts (see also Osgood, Luria, Jeans, & Smith, 1976).

A similar emotional bias can be shown when happy, angry, or sad subjects daydream or make up imaginative stories for ambiguous pictures of the Thematic Apperception Test (see Bower, 1981).



Happy subjects compose stories of achievement and love, whereas angry subjects tell stories filled with conflict, frustrations, and fights. Again, my theory would assume that the subject's current emotion will activate the same themes that have, in the past, caused the person to react with just that emotion, and so he or she gives them back. This theme activation is relevant to the daydreams, ego-ideals, and fantasies of the alternative multiple personalities.

Third, mood biases people's snap judgments about familiar people and topics. We find that subjects who are temporarily happy give very friendly, charitable descriptions of their acquaintances, whereas angry subjects give uncharitable, critical assessments (see Bower, 1981). This bias may be explained by supposing that people have stored a variety of impressions about familiar persons, and the subject's current mood causes retrieval of primarily positive or negative memories of that person. Thus, a quick evaluation of that person will be biased by the preponderance of one-sided opinions that come to mind (see the "availability heuristic" of Tversky & Kahneman, 1973). This bias is like that of a multiple who has completely different opinions about some person or topic depending on which personality is dominant at the moment.

To continue listing the effects of emotional activation, we find that emotion influences people's forecasts or judgments of the likelihood of future events. In one of our experiments (cited in Bower, 1983), we found that subjects who were made momentarily happy tended to be optimistic—overestimating the likelihood of blessings in the future and underestimating that of future disasters—whereas subjects who were made temporarily sad were pessimistic in their likelihood estimates of positive or negative events in the future (see Fig. 7.8). Thus, temporarily happy people believe in a rosy future that will be filled with excitingly positive successes, whereas sad people construct for themselves a bleak future filled with anticipated failures, losses, frustrations, and gloom. These distorted forecasts also arise when people under an emotional spell predict their own performance capabilities, whether they will succeed or fail in some project (see

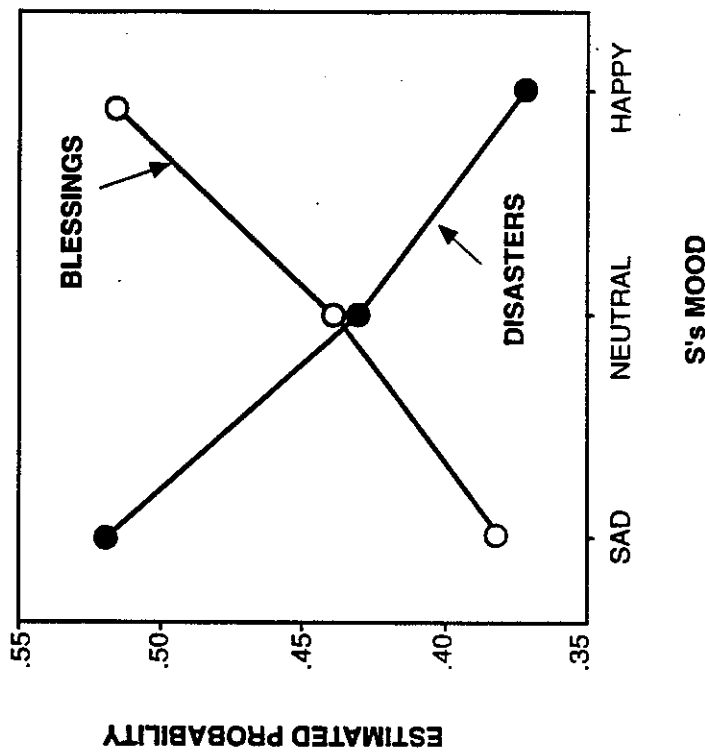


FIG 7.8. Estimates of subjective likelihood of positive (blessings) or negative (disasters) events in the future for subjects induced to feel happy or sad before they gave their estimates. (From Bower, 1983, reprinted by permission.)

Kavanagh & Bower, 1985). And such forecasts influence the kind of decisions and plans people make in preparation for that future.

Thus, prevailing moods affect our judgment of our competence, and that judgment affects the quality of our performance. Thus, in social interactions, our sad mood may cause inept performances which will indeed provoke from others the very reactions that will fulfill our prophecy and maintain our prevailing mood. Reciprocity in social interactions is the root cause of emotional contagion: happy, up-beat people spread their joy to others, so that they attract friends; depressed people spread gloom, so everyone avoids them; angry people provoke anger from others, so they conclude that they live in

a world of hostile sharks. Thus, with a multiple personality, reciprocal reactions from others will serve to create a social reality that can maintain whatever ego is momentarily dominant.

As this suggests, we find that a person's mood strongly affects his or her social judgments and the impressions he or she forms of other people. Social perception is highly subjective and evaluative, because we have to read the intentions hidden behind people's words and actions. In that reading, our current emotional premise strongly influences how we interpret others' behavior. Thus, happy people tend to be charitable and positive in their interpretation and impressions of others they are meeting. Angry people tend to be overly critical, ready to find fault and take offense. They may take out their anger on innocent bystanders as convenient scapegoats.

These emotional influences on personal judgments also apply when people judge themselves and their own behavior. For instance, depressed patients criticize themselves unjustly for what they perceive as their incompetent actions. In an experiment with Joe Forgas and Susan Krantz (Forgas, Bower, & Krantz, 1984), we investigated whether someone's emotional state would influence their moment-by-moment perception of their own behavior. Specifically, we asked whether fairly well-adjusted college students would see themselves as incompetent and socially unskilled if they viewed themselves on video-tape while feeling sad and rejected, but see themselves as competent and socially skilled if they looked at themselves while feeling happy.

In a 2-day experiment, we first interviewed subjects for 20 minutes about personal topics as they were video-taped with their knowledge and consent. The next day they learned how to score video-taped interviews for positive prosocial or negative antisocial behaviors. Examples of positive behaviors were smiling, leaning forward, and contributing friendly remarks; negative behaviors were frowning, looking away, and so on. Following this training, they were hypnotized. Half of them were asked to remember and replay in imagination a moment of social success when they had performed

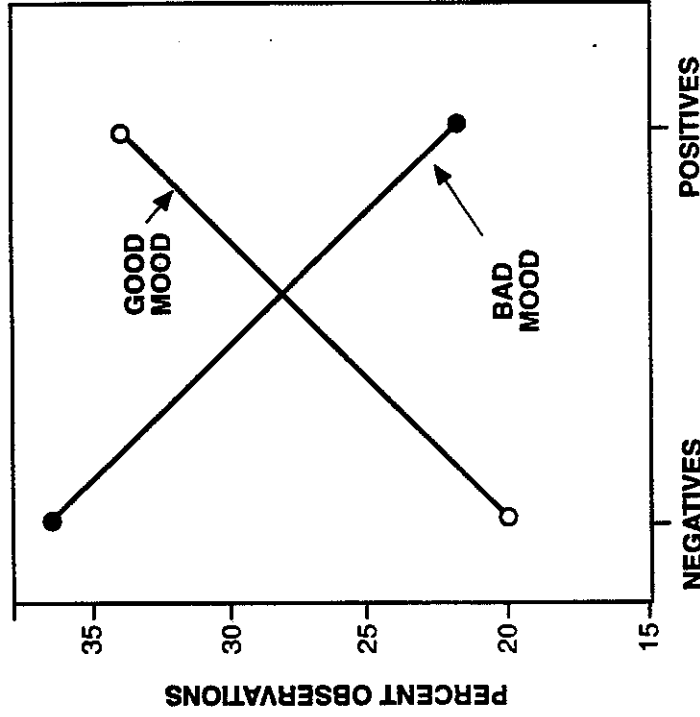


FIG. 7.9. Proportions of observations where people perceive themselves on video as emitting positive, prosocial or negative, antisocial behaviors when the perceivers themselves are in a good or bad mood. (Based on data reported by Forgas, Bower, & Krantz, 1984, adapted by permission.)

well and felt good about themselves. The others were asked to recall and replay a moment of social failure when they had felt embarrassed or socially rejected because of something they had done that they deemed awkward or shameful. Subjects were then asked to maintain their mood while they looked at the 20-minute video-tape of themselves being interviewed the previous day. Every 5 seconds they marked at least one positive, negative, or neutral behavior they observed in themselves.

Figure 7.9 shows the percentages of their observations that fell into the prosocial and antisocial categories. People in bad moods saw

themselves in the video-taped interview as exhibiting many more negative, socially inept actions than positively skilled ones. In contrast, subjects in good moods saw themselves exhibiting more positive, prosocial actions. These differences are "all in the eye of the beholder," insofar as neutral judges rated the two groups as having equal proportions of positive and negative behaviors. Remember that these are moment-by-moment perceptual judgments, so the fact that they vary with the observer's mood tells us that whether actions are seen as positive or negative depends more on the observer than on the stimulus; and that just underscores the ambiguity of body language and normal conversations. It thus appears that social behavior is almost a blank screen where viewers project a picture according to their mood. They can even project a picture onto themselves, one that matches their current feelings.

Such emotional influences on social judgments can be explained by the associative network theory. The perceiver's mood activates and primes into readiness certain mood-congruent concepts, hypotheses, and inference rules that are then used for classifying the ambiguous gestures, phrases, and expressions of a person during conversation, whether that person is a stranger or oneself.

I have been discussing how our emotions alter our thinking, judgments, and ways of viewing the world and ourselves. Now, to relate this work to multiple personalities, I present one more result, namely, the ways emotions influence the way we think about our own personality and identity.

An especially interesting variant of an emotional bias arises when subjects describe themselves. Several different types of self-ratings can be taken. One is to ask subjects to estimate their subjective state of well-being or their satisfaction with themselves and their life situation. It turns out that people who are temporarily happy report far greater satisfaction than do sad people, even if the cause of their current mood is a passing irrelevancy such as whether it is a sunny, beautiful day or a dull, overcast day (Schwarz & Clore, 1983a). Also, if you take a medical history or health-status report, people who are

temporarily sad will find more things wrong with themselves, have more symptom complaints, and rate their health status far lower than will people who are temporarily happy, despite the fact that their emotions may be due to some irrelevancy such as their favorite football team having just won or lost a crucial game.

Of special interest here is that people's reports of their so-called stable personality characteristics can be significantly altered depending on their passing mood. The simplest way to conduct these experiments is to first induce a mood in subjects by some means, such as having them write about some happy or sad events from their lives. Then, using a bogus cover story to mask the true purpose, subjects are led to believe that, as part of a second, unrelated study, they should fill out a personality questionnaire, checking those stable, enduring personality traits that describe what they are really like.

The mood-related effects can be quite dramatic (see Wright & Mischel, 1982). If we compare the trait adjectives people choose to describe themselves, the temporarily happy subject is likely to check such traits as "confident, worthy, socially skilled, lovable, successful, lively, and strong." In contrast, temporarily sad subjects are likely to describe themselves as "helpless, cautious, weak, incompetent, apathetic, guilty, discouraged, and unlovable." Even with these basically well-adjusted college students, a temporary mood-shift can dramatically influence their self-descriptions, their self-image, and their reported personality. It is as though they cannot discount or cancel out their current, temporary feelings: they err by taking their current feelings and thoughts as partial indicators of what they are really like most of the time (see Schwarz & Clore, 1983a, 1983b). Incidentally, people are usually quite unaware of how much their temporary mood state is influencing the way they describe their personality.

These changes in self-descriptions can be explained again in terms of selective mood dependent retrieval. We may think of our self-concept as a unit in memory that has hundreds of associations attached to it—all kinds of demographic facts as well as trait labels,

behavioral happenings, opinions about us gathered from acquaintances, as well as self-observations. Some of these are positive, some are negative, many are simply neutral. When we are in a positive mood, this positive activation will spread to the positive opinions and positive memories about ourselves. These highly available thoughts come flooding to mind and this biased evidence tricks us into believing that we are really a wonderfully competent person in all facets of our lives. Of course, the sadness of the depressed person works in the same exaggerated way but with just the opposite result.

These mood changes affect not only a person's self-described personality but also his or her overt behavior. Subjects we have induced to feel happy will have an upright expansive posture with their heads held high and their shoulders thrown back; our subjects induced to feel sad appear to be caved in, huddled over, pensive, and fatigued. Their expressive styles are also radically different. Happy people are bubbly, smiling, energetic, and outgoing; they speak loudly and quickly, and move quickly. Sad people are just the reverse: they are slow moving, speak slowly and softly, and appear depleted and downcast (see, e.g., Clark, 1983; or Goodman & Williams, 1982, for reviews).

Although these behaviors are quite familiar, I want to make two points that relate to multiple personality. First, different temporary emotional states can produce what appear to be quite different behavioral styles and personalities, even in normal individuals. And along with these personality differences, moods also create partial amnesia for memories acquired in different emotional states, as I noted before.

Second, I think these results may help us understand some phenomena of multiple personality disorders. As I read the literature on multiple personalities, I was struck by how often each alternate ego was characterized by a different dominant emotional state or different prevailing affective tone, often one surrounding its identification with another person who exemplified that emotional

style. For example, one alter ego may exemplify hostile vengeance, with its basic script having been acquired in identification with someone who abused the patient as a child.

There is much support for this view that personality splitting usually occurs along affective lines, with each alter ego dealing with a related set of conflicts and feelings. At a speech a few years ago at the American Psychiatric Association, Dr. Cornelia Wilbur, who treated the famous patient Sybil, said, "In the analysis of the various alternate personalities of a multiple personality, we find individuals who deal with rage and hatred, individuals who deal with hypocrisy and dishonesty in others, alternates who deal with envy and jealousy in themselves and in others, and individuals who encapsulate intense affect and conflict of all kinds" (Institute of Noetic Sciences, 1985, p. 13). Dr. Bennett Braun published similar ideas in a theoretical paper in 1984. He wrote: "Multiple personalities . . . are created via repeated dissociation that occurs under extreme stress (most often child abuse). These dissociations often have similar affective states . . . that chain them together so that they can develop a history of facts and memories . . . and a set of response patterns (that are operantly learned and maintained)" (p. 173).

Eugene Bliss (1980) noted a similar tendency for alternate egos to fulfill different coping functions, to express specific emotions, and to deal with particular problems. He wrote, "The activation or emergence of an alter ego usually indicates that the subject herself experiences an intense emotion that has previously been delegated to a personality whose speciality it is—be it fear, anger, rejection, loneliness, or a sense of inadequacy" (p. 1390).

In a well-documented case reported by Ludwig, Brandsma, Wilbur, Bernfeldt, and Jameson (1972), a young man named Jonah had three alter egos. One ego state (King Young, the lover) came out when Jonah wanted to make sexual advances to women, another (Usoffa Abdulla, the warrior) came out when Jonah got into fights and brawls, and the third ego (Sammy, the slick con man and shyster) came out to help get the other two out of trouble. Jonah is a clear

example of different sets of beliefs, values, and memories clustered around different motivational complexes and dominating themes.

I suggest that these different ego states may be intensely involving role enactments originally brought on as defenses in different emotional situations. With practice, these roles become completely suffused and bound up with these distinctly different emotions, so that they create separate memory compartments. Thus, when Jonah felt angry and aggressive, that state recruited a set of memories, beliefs, and behavioral scripts relevant to expressing aggression, and this configuration emerged as the character of Usoffa Abdulla. When Jonah got into a situation where he felt sexually aroused, that emotional state triggered a different set of memories, beliefs, and behavioral scripts that were manifested in the role of King Young, the lover.

Furthermore, I think that these parallels between mood-state dependent memory and multiple personality even extend to a few qualifiers of their features. First, the amnesia between personalities is often not symmetric; the alternate personalities typically know about events that happened when the host personality was in control, whereas the host is usually blacked out and amnesic regarding events that happened when the alternates were in control. But such asymmetric amnesia is often found too in laboratory studies with drugs and mood changes. For example, alcohol produces such asymmetries: events learned when people are drunk are state-bound in that the events are recalled best if they get drunk again. However, events learned when people are sober are about equally well recalled whether they are sober or drunk (see Eich, Weingartner, Stillman, & Gillin, 1975).

A second qualifier in our parallel is that the dissociations between the different mood states are *not* 100%, all-or-none; rather, they are graded or partial, showing more or less access to memories in the alternate states. Even in our best demonstrations of mood-dependency, subjects in an opposite mood could still recall about half of the material they recalled when in the original mood. Interestingly,

a similarly *partial* amnesia also occurs with many multiple personalities. For instance, the objective studies of Jonah's memory by Ludwig and his associates demonstrated that most of Jonah's alter egos showed partial memory for neutral word lists learned by the other personalities.

A third qualifier to our parallel of mood dependency and dissociation is that memory from one mood or personality state to another varies dramatically according to which memory indicator we use. The memory index that shows the greatest loss, or amnesia, is what we call *free recall* or *unaided recall*. In free recall, we give almost no memory aids or cues at all to the subject except for the prompt, "Tell me what you were doing during such and so time" (such as during a blackout or during a mood shift). This open-ended question produces relatively poor recall inasmuch as the person is left to his or her own devices for reinstating the original context and generating his or her own internal cues or reminders. In contrast to this deficit with free recall tests, the amnesia appears far less severe if we test the person with more explicit cues, prompts, and reminders. For example, if we test our subjects' memory by forced recognition where they select which of two items they had learned before, then we rarely find a state-dependent memory loss from either drugs or emotional states (for a review, see Eich, 1980).

The point is that retrieval depends on the power of the cues, prompts, and reminders used to test for a certain memory; and I would expect that the amnesias shown clinically across multiple personalities would appear significantly less massive if the person were tested with stronger prompts or recognition reminders for events that had happened to them while they were in an alternate state.

The discrepancy between different memory indicators became salient for me recently while reviewing the evidence for dissociation produced by post-hypnotic amnesia. I mention the topic here because post-hypnotic amnesia is often viewed as a model of memory dissociation of the sort seen in multiple personality. In fact, Eugene Bliss' theory (Bliss, 1980) is that multiple personality arises when

patients use frequent self-hypnosis to cope with their many traumatic abuses.

Now, post-hypnotic amnesia is surely a most dramatic display of dissociation in which subjects apparently are unable to retrieve certain target memories until the hypnotist gives a signal, releasing the amnesia. But upon close scrutiny, various qualifications begin to appear (see Coe, 1978). First, about two thirds of normal subjects do not show any post-hypnotic amnesia. Second, of those who do, about half can have their amnesia broken or breached by strong commands and social pressures to be honest and to try hard to recall. Third, many subjects who do not recall the target items appear to engage in active strategies to avoid searching memory, perhaps by simply thinking about other things. And fourth, a variety of indirect measures of memory, which by-pass consciously controlled forms of recollection, demonstrate that these subjects have perfectly good memory for the material they have supposedly forgotten.

Table 7.1

Memory Indices	
<i>Optional Controllable</i>	<i>Obligatory Uncontrollable</i>
Free Recall	GSR
Narrative Reconstruction	Perceptual Fluency
Feeling of Knowing	Priming Fragments
	Practice Savings
	Interference

Table 7.1 lists these two different kinds of memory indicators. Those in the left column are called *controllable* or *optional* measures where subjects can consciously decide at their option to alter their performance (see Cofer, Chmielewski, & Brockway, 1976). These indicators reveal large forgetting and amnesia effects in mood-state and drug-state experiments, in multiple personality, and in post-hypnotic amnesia.

The measures in the right-hand column are labeled *uncontrollable* or *obligatory*, because these are often indirect, sneaky, outside the person's conscious control, and are difficult to fake. To briefly review these (see Bower, 1990), take the phenomenon of post-hypnotic amnesia. Subjects exhibiting post-hypnotic amnesia will nonetheless show a strong GSR (sweating of the palms) to target items which they've been told to forget. Also, when the allegedly amnesic items are quickflashed in a tachistoscope or spoken over noisy earphones, the subjects will still perceive those items more quickly than control items. Also, if a word has been presented and primed but covered with amnesia, the subject is still very likely to use that word to complete a word fragment. For example, if the word STEEL has been presented under hypnosis and then covered with amnesia, and subjects are later asked to complete a fragment S \_ \_ L with the first word that comes to mind, they are very likely to spell STEEL rather than STILL, STOOL, or STALL.

Amnesic subjects also show big savings in practice on motor tasks such as target tracking in videogames—their improvement in such skills carries over from one practice session to the next, despite subjects professing that they have never seen the task before. Finally, material that is learned and then covered with an amnesia suggestion nonetheless continues to cause its normal amount of interference and forgetting when the person tries to remember some other material. To illustrate, suppose I first teach you to associate 10 women with the names of their first husbands; and then all 10 get divorced and remarry. I then teach you the names of their second husbands; but afterwards I cover this second learning with a hypnotic amnesia suggestion. When I later ask you to recall each woman's first husband, you will still show massive forgetting and interference due to the second learning. Moreover, the forgetting is just as great whether or not I tried to get you to wipe out that second learning with an amnesia suggestion. In other words, interference in memory is not something you can consciously turn on or off at your option; it is an obligatory feature of the human memory system.

I now return to the topic of dissociative disorders. As a memory theorist, these disorders are fascinating to me because they show a pattern of apparently massive forgetting across altered states. However, I think we need more objective memory studies carried out with such patients during their alternate states in order to get a clearer idea of what kinds of information transfers occur between the different states and how the transfer varies according to which memory indicators are used. I would expect that the uncontrollable, obligatory indicators will show large amounts of memory being transferred from one personality state to the other, whereas the controllable indicators (which clinicians mainly rely on) will show state-specific amnesia. But we clearly need some more systematic studies to reach such a conclusion and develop its implications for the understanding of multiple personality and its treatment.

To review my main points, I have discussed mood-dependent retrieval of memories and also indicated the impact of people's temporary emotions on their attitudes, opinions, judgments, forecasts, fantasies, self-image, expressive style, interpersonal behavior—in short, their personality. These studies involved normal, well-adjusted adults who simply were behaving under the spell of some temporary emotion. I view these changes as a mild form of the extreme kinds of personality shifts and memory dissociations that clinicians might see in their patients.

Although my results can provide us with such parallels in normal people, I must confess that I still approach the clinical phenomena of multiple personality and dissociation with a mixture of mystery, awe, and wonderment. It is a challenging task to try to explain any part of those puzzles, and I surely admire the courage and persistence of clinicians who are trying to understand and conduct therapy with such patients.

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### III SCIENTIFIC ANALYSIS

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