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Mood-Congruent Retrieval: A Methodological Comparison

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MOOD-CONGRUENT RETRIEVAL:
A METHODOLOGICAL COMPARISON

by

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VITA

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INTRODUCTION

Are emotionally charged memories recalled more easily when your current mood matches the memory? Evidence suggests that affective states can serve as retrieval cues for memories that are emotionally charged. Consequently, our memory processes may be biased by the mood we are in at the time of recall. Much of this research has been conducted to investigate a hypothesis of "mood-congruent retrieval" which suggests that the kind of information we are most likely to recall in a particular mood state will be congruent with our mood at the time of remembering. More specifically, congruent information is hypothesized to be more accessible. Studies of this phenomenon have primarily involved putting subjects into either a positive or negative mood by means of some affect induction technique, and then measuring the effects of their moods on some recall task. Although most of this research finds support for a mood-congruent recall effect for positive states (i.e., people in "happy" moods tend to remember more positive things), the results with respect to negative mood states are less consistent.

The present study also examined the influence of positive and negative mood states on the retrieval of affectively-toned information. An additional focus of this research, however, was to determine whether the inconsistencies of earlier research are due, in part, to differences in the methodologies used to manipulate moods and measure memory. The following literature review identifies potential sources of inconsistency stemming from the use of different methodologies.

REVIEW OF RELATED LITERATURE

A myriad of mood induction techniques appear in the literature on mood-congruent retrieval. For example, investigators have tried to put people into positive and negative moods in ways ranging from having them win or lose at a computer game to hypnotizing them. According to Isen (1984), however, a distinction should be made between mood manipulations that may have a "direct" effect on cognitive processes (e.g., those in which subjects are asked to imagine and remember a happy or sad time, or to read statements that suggest that they feel a particular mood state) and manipulations that may have only an "indirect" effect on cognition (e.g., those in which subjects are given success or failure feedback in order to manipulate their mood covertly, without their awareness). The need for a distinction between direct and indirect procedures suggests that various types of mood inductions may influence both cognition and memory in different ways. If a direct mood induction is able to prime "affective" concepts either separately or in conjunction with altering a subject's mood, it becomes difficult to distinguish whether it is the subject's mood or a cognitive

component in the manipulation that is biasing a subject to retrieve mood-congruent memories. This potential difference between types of mood inductions may play a role in explaining discrepancies in study findings appearing in the literature.

Researchers have also used a variety of recall measures to assess the influence of mood on memory. The dependent measures appearing in the literature, however, can be placed into two general categories: verbal recall measures and recall measures of actual life experience. The first type of measure requires subjects to recall verbal material (e.g., words or sentences) learned earlier in an experimental session. The second type of measure has subjects recall personal memories of actual life experiences. Because retrieving a memory from past experience may be different than recalling words from a list seen briefly moments before, it also seems important to explore whether different types of recall measures have influenced study findings.

The existing literature is organized and reviewed according to the methods used to manipulate mood and measure memory. Based on these two characteristics, studies in this area can be grouped into the following designs: (1) indirect mood inductions paired with verbal recall measures, (2) direct mood inductions paired with verbal recall measures, and (3) direct mood inductions paired with the recall of actual life experiences. Our review of the literature did not discover any studies combining an indirect mood

induction with a recall measure of actual life experience.

INDIRECT MOOD INDUCTION AND RECALL OF VERBAL MATERIAL

Two studies have investigated the effect of an indirect mood induction on the recall of verbal material (Isen, Skalker, Clark & Karp, 1978; Laird, Wagener, Halal & Szgeda, 1982). Isen, et al, (1978) used success and failure at a computer game to manipulate positive or negative feeling states. Prior to the game subjects were instructed to listen carefully to a tape of pleasant, unpleasant and neutral words. Following the mood induction procedure, subjects were asked to recall as many of the words as possible. Their findings indicated that subjects who won the computer game (i.e., the "success" group) just prior to recall remembered significantly more positive words than those who lost. The success group, however, did not differ significantly from the failure group on the recall of any other words.

A second study using verbal recall and indirect mood manipulation was conducted by Laird, et al (1982). The facial expressions of subjects were manipulated into positions of either a smile or a frown with the expectation that such expressions would induce emotional state.[1] Subjects read both funny selections from Woody Allen stories and anger-provoking editorials on the killing of dolphins. Following the mood induction, they were asked to recall as much of the two passages as possible. As expected, facial expression influenced recall; the Woody Allen stories were better

remembered when smiling whereas the editorials were better remembered when frowning. In other words, positive mood facilitated the recall of positive material and negative mood facilitated the recall of negative material. Laird, et al (1982) also conducted a second study to examine the effects of angry, sad and fearful moods on memory. Again, facial expression was used to manipulate mood, and affectively--toned sentences were used as a recall measure. The findings confirm a symmetric retrieval effect for positive and negative material with subjects recalling more sentences whose tones were consistent with facial expression at the time of recall. The authors suggest that the memory effects demonstrated may be a function of specific emotions rather than global positive or negative feeling states.

DIRECT MOOD INDUCTION AND RECALL OF VERBAL MATERIAL

Other investigations on the effect of induced mood state on memory have used verbal recall measures and more direct methods for manipulating moods (Bower, Gilligan & Monteiro, 1981; Bower & Mayer, 1985; Bower, Monteiro & Gilligan, 1978; Clark & Teasdale, 1985; Clark, Teasdale, Broadbent & Martin, 1983; Gerrig & Bower, 1982; Gotlib & McCann, 1984; Mecklenbrauker & Hager, 1984; Nasby & Yando, 1982; Teasdale & Russell, 1983).

Bower and his associates have conducted several studies examining the effect of hypnotically-induced mood on the

recall of verbal material. For example, Bower, et al (1981) conducted three experiments in which subjects read stories containing both happy and sad elements, and were hypnotized into happy and sad moods. The study reported no effect of mood at the time of recall for positive and negative material contained in the stories. Similarly, Bower, et al (1978) and Bower & Mayer (1985) used hypnosis to induce mood in subjects who had previously learned lists of abstract nouns differing in emotional tone. Again, in four experiments (three from Bower, et al, 1978) mood at the time of retrieval did not influence the type of verbal material recalled. However, Bower, et al (1978) did note that in two of three of their experiments the first word recalled by the majority of subjects was consistent with their mood at the time of retrieval.

The most commonly used direct mood induction techniques are those modeled after the Velten Mood Induction Procedure (Velten, 1968). This procedure involves having subjects read a series of statements designed to put them in either an elated or depressed mood state. For example, to induce depression, subjects read a number of statements such as "I feel sad and blue" and, to induce elation, subjects read statements such as "I feel cheerful, confident."

Several studies using a modified Velten mood induction have examined memory for verbal material (Gotlib & McCann, 1984; Mecklenbrauker & Hager, 1984; Teasdale & Russell,

1983). For example, Teasdale & Russell (1983) examined whether different verbal materials used as recall measures produce different findings. They suggested that Bower and his associates failed to replicate mood-congruent retrieval because of the type of word list they used (i.e., abstract nouns). Therefore, using a modified Velten procedure for inducing mood and a list of personality trait words to measure memory, Teasdale & Russell examined whether elated and depressed mood states had different effects on memory. As predicted, significantly more positive trait words were remembered by the elated mood group than by the depressed mood group, and significantly more negative words were recalled by the depressed mood group than by the elated mood group.

A similar study conducted by Gotlib & McCann (1984) investigated whether mood states induced by a modified Velten procedure would influence memory for a list of adjectives differing in emotional valence. Unlike any of the studies discussed thus far, Gotlib & McCann (1984) also included a group of control subjects in a neutral mood. Their results, however, produced no indication of mood-congruent retrieval; the elated, depressed and control groups did not differ significantly in their memory for positively or negatively toned adjectives.

Mecklenbrauker & Hager (1984) used a modified Velten mood manipulation to examine recall for positive and negative

elements embedded in a narrative story. Again, no evidence of mood-congruent retrieval was found with the elated and depressed groups recalling approximately equal amounts of the positive and negative elements.

Another set of studies used music to manipulate mood directly (Clark & Teasdale, 1985; Clark, Teasdale, Broadbent & Martin, 1983)[2]. Clark & Teasdale (1985) investigated the effects of musically-induced mood states on memory for both pleasant and unpleasant personality trait words and abstract nouns. The music for the depression induction was "Russia under the Mongolian Yoke" by Prokofiev, played at half speed. The music for the elation induction was "Coppelia" composed by Delibes, played at normal speed. Although the authors predicted that mood state would have a stronger effect on memory for trait words than abstract nouns, they found no such difference. However, a symmetric mood-congruent retrieval effect was found for women in their study. In other words, women in happy and sad moods remebered significantly more happy and sad words, respectively. Men, on the other hand failed to show any mood-congruent retrieval.

Similarly, Clark, et al (1983) examined whether a musically induced mood state (1) affects subjects' ability to discriminate between rapidly presented positive, negative and neutral words, and (2) affects recall of words presented in a lexical decision-making task. Their findings showed

no indication of mood-congruent retrieval. In fact, subjects tended to recall mood-incongruent words more easily.

Finally, Nasby & Yando (1982) used a direct mood induction technique in a study of fifth grade children. The children were asked to describe and imagine an experience in their life that made them feel either really happy, really sad, or neither. Prior to the mood induction subjects were presented with a list of adjectives classified as either highly or slightly positive and highly or slightly negative. Each subject would think about two personal experiences followed by a recall session of the adjectives. As compared to subjects in both the sad mood group and the control group, the subjects in the happy mood group recalled significantly more positive adjectives. No significant differences were found for the recall of negative adjectives.

DIRECT MOOD INDUCTION AND RECALL OF LIFE EXPERIENCE

A number of studies have also examined the effect of induced mood states on memory of actual life experience (Bower, 1981; Forgas, Bower & Krantz, 1984; Madigan & Bollenbach, 1982; Mathews & Bradley, 1983; Natale & Hantas, 1982; Riskind, Rholes & Eggers, 1982; Snyder & White, 1982; Teasdale & Fogarty, 1979; Teasdale & Taylor, 1981; Teasdale, Taylor & Fogarty, 1980).

Several studies using a Velten mood induction technique have examined whether recall latencies for positive and

negative memories differ in elated and depressed mood groups (Riskind, et al, 1982; Teasdale & Fogarty, 1979). Teasdale & Fogarty (1979) examined whether memories about pleasant and unpleasant personal experiences were retrieved faster in an elated or depressed mood. Although they found that the retrieval time for pleasant memories was significantly shorter for subjects in an elated mood, no significant differences were found for the retrieval of negative memories. Using a similar procedure for manipulating mood, Riskind, Rholes & Eggers (1982) looked for differences among mood groups in the amount of time needed to generate positive and negative memories. Their findings indicated a symmetric mood-congruent difference between positive and negative memory latencies (i.e., those in elated moods retrieved positive memories more quickly and those in depressed moods retrieved negative memories more quickly).

Other studies using Velten mood induction procedures have had subjects generate personal memories and then rate them on their affective tone (Madigan & Bollenbach, 1982; Mathews & Bradley, 1983; Natale & Hantas, 1982; Snyder & White, 1982; Teasdale & Taylor, 1981; Teasdale, Taylor & Fogarty, 1980). Several of these studies reported symmetric mood-congruent retrieval effects with elated subjects recalling more happy and fewer sad memories than depressed subjects (Natale & Hantas, 1982; Snyder & White, 1982; Teasdale & Taylor, 1981; Teasdale, Taylor & Fogarty, 1980). In

two studies conducted by Madigan & Bollenbach (1982) however, only an asymmetric mood-congruent retrieval effect for positive memories was reported. Finally, Mathews & Bradley (1983) combined a Velten mood induction and a musical procedure comparing depressed subjects to subjects in a neutral mood. As expected, they found that the memories generated by the depressed group were significantly more negative than those generated by the controls.

Two studies using hypnosis to induce mood have examined recall for personal experiences. Forgas, Bower & Krantz (1984) found that subjects hypnotized into bad moods recalled more about stressful experiences in their lives than subjects hypnotized into good moods. Similarly, subjects in good moods remembered more about comfortable experiences than subjects in bad moods. In a similar study, Bower (1981) found that when subjects kept a day to day recording of their emotional experiences they recalled more pleasant incidents when in a good mood, and more unpleasant incidents in a bad mood.

Table 1 summarizes the findings and methodologies appearing in the literature. The following section discusses the role that methodological differences may have played in producing some of the inconsistent findings.

METHODOLOGICAL CONCERNS

As is evident from Table 1, studies investigating

TABLE 1

Study	Mood Induction and Design**	Recall Measure	Results*
Bower (1981)	DIRECT**	EXPERIENCE	0
Forgas, et al (1984)	DIRECT	EXPERIENCE	±
Madigan & Bollenbach (1982)	DIRECT	EXPERIENCE	+
Mathews & Bradley (1983)	DIRECT**	EXPERIENCE	-
Natale & Hantas (1982)	DIRECT	EXPERIENCE	±
Riskind, et al (1982)	DIRECT	EXPERIENCE	±
Snyder & White (1982)	DIRECT	EXPERIENCE	±
Teasdale & Fogarty (1979)	DIRECT**	EXPERIENCE	+
Teasdale & Taylor (1981)	DIRECT**	EXPERIENCE	±
Teasdale, et al (1980)	DIRECT**	EXPERIENCE	±
Bower, et al (1981)	DIRECT	VERBAL	0
Bower & Mayer (1985)	DIRECT	VERBAL	0
Bower, et al (1978)	DIRECT**	VERBAL	0

TABLE 1, continued

Study	Mood Induction and Design**	Recall Measure	Results*
Clark & Teasdale (1985)	DIRECT	VERBAL	± ***
Clark, et al, (1983)	DIRECT	VERBAL	0
Gerrig & Bower (1982)	DIRECT	VERBAL	0
Gotlib & McCann (1984)	DIRECT	VERBAL	0
Mecklenbrauker & Hager (1984)	DIRECT	VERBAL	0
Nasby & Yando (1982)	DIRECT	VERBAL	+
Teasdale & Russell (1983)	DIRECT	VERBAL	±
Isen, et al (1978)	INDIRECT	VERBAL	+
Laird, et al (1982)	INDIRECT	VERBAL	±

* +=only positive mood facilitated recall of positive material
-=only negative mood facilitated recall of negative material
±=both (i.e., symmetric mood-congruent retrieval)
0=neither (i.e., no significant mood-congruent effects)
** within-subjects design (all others between-subjects designs)
*** for women only

the effects of induced positive and negative mood states on the retrieval of emotionally charged material have yielded inconsistent results. With the exception of seven studies, inducing a positive mood during recall facilitated the retrieval of positive material from memory. Of the seven studies that did not find this effect, all involved direct mood manipulation: four used hypnosis as an affect induction technique, two used the Velten procedure and one used a musical manipulation. Moreover, all of the recall measures used in these seven studies were verbal rather than actual life experience measures.

The results with regard to the recall of negative material are considerably more inconsistent. Half of the studies appearing in Table 1 concluded that negatively-toned material is more accessible when subjects are in a negative mood during retrieval. The remaining studies found no relationship between mood state and recall of negative information. One explanation for the inconsistent pattern of results is that positive and negative mood states may not have symmetrical influences on retrieval. An alternative explanation to be tested in the present study, however, is that the various methods used to induce affective states and the variety of measures used to assess memory may be contributing to the inconsistency.

The following section considers the strengths and limitations of various mood induction procedures and various

recall measures.

MOOD INDUCTION PROCEDURES

Direct Mood Manipulations. As discussed earlier, a distinction can be made between mood manipulations that may have a direct effect on cognitive processes, and those that may have only an indirect effect on cognition. Because the dependent measures in all of these studies concern the cognitive process of memory, the more direct mood manipulations are criticized for having potential "priming" effects rather than pure mood effects (see for example, Blaney, 1986; Isen, 1984). In other words, thinking about feeling happy may stimulate or prime a network of happy memories without necessarily changing the mood of the subject. Therefore, it may be difficult to distinguish between an induced affective state as a retrieval cue and the cognitive manipulation used in the induction as a possible cue for certain memories. Furthermore, some of the direct mood inductions may be capable of inducing a mood as well as separately priming concepts. Although it seems critical that studies of this type use mood manipulation checks, only about half of the studies appearing in the literature actually did use them.

A second limitation concerns the possibility of "demand characteristics" with the more direct mood induction techniques. When subjects are aware that the purpose of the experiment is to manipulate their mood state, they may

react to the social pressure of the situation and respond as though their mood has been altered.

An additional problem with some of the more direct mood induction procedures is that they use highly selected samples and therefore can be criticized for limited external validity. For example, when hypnosis is used to induce mood, only a select group of highly "suggestible" subjects may be used (see for example Bower, 1981; Bower, et al, 1981; Bower & Mayer, 1985). Similarly, many of the studies using the Velten mood induction procedure use "cut-off" or criterion scores for selecting their subjects (see for example Teasdale & Fogarty, 1979; Teasdale & Taylor, 1981). Subjects who fail to meet an acceptance criterion (i.e., fail to report feeling the degree of mood expected) are excluded from the study.

Indirect Mood Manipulations. Although indirect mood manipulations have been used less frequently than direct induction techniques, they may have several advantages. First, they may more accurately mimic ways that moods come about in everyday life, thereby offering more "natural" manipulations of mood. For example, the experience of success and failure feedback is something fairly common to the college student population from which most of the studies in this area draw their samples. Furthermore, indirect procedures are probably less vulnerable to experimental

demand than those involving more direct cognitive manipulation. A potential confound with some of the indirect negative mood inductions, however, is that they may lead to motivation problems on the recall task. For example, providing someone with false feedback telling them that they did poorly on a test may decrease their motivation to continue participating in the experiment or try very hard on the recall task.

Two other issues regarding mood induction techniques should be mentioned here: the use of manipulation checks and the use of control groups of subjects in neutral moods. Unfortunately, very few manipulation checks of the mood inductions have been used in this research area. This would seem essential in all studies manipulating mood, but most especially in mood induction procedures which are indirect. Because the influence of negative affect is not clearly understood, it is crucial that the moods be checked for intensity. One explanation for the inconsistent findings with regard to negative affect is that the mood states produced in some experiments may not have been intense enough to have an effect on memory.

A final limitation concerns the use of control groups. With the exception of four of the studies reviewed (Gotlib & McCann, 1984; Madigan & Bollenbach, 1982; Nasby & Yando, 1982; Natale & Hantas, 1982) subjects in positive moods were compared only to subjects in negative moods. Blaney (1986) suggested that in the absence of a control group,

differences between a positive and negative mood group may really be a "drift away from positivity toward neutrality" (p.238). Clearly, the absence of manipulation checks and control groups limit construct validity and may have important effects on a study's results.

MEMORY MEASURES

Verbal Recall Measure. An important issue in studies requiring subjects to recall word lists, sentences or parts of stories is that they often report very low overall recall rates (see for example Teasdale & Russell, 1983; Isen, et al, 1978). In most cases, subjects are given only one presentation of the material. Therefore, an effect would have to be quite strong to be detected with such low baseline rates of recall. As mentioned above, the seven studies that did not report a mood-congruent retrieval effect for positive states all involved the use of a verbal recall measure. It is possible that the studies finding no significant memory effect may actually reflect the difficulty in using this type of measure rather than lack of a relationship between mood and memory.

Actual Life Experience Measures. Although studies using both verbal material and personal memory measures have found mood-congruent retrieval effects, recall measures of personal memory have one clear advantage: they may more

accurately reflect the process under study. Retrieving a personal memory to a cue word seems to be a more "natural" measure of memory than requiring subjects to retrieve words to which they had only a brief exposure.

RESEARCH DESIGN

The preceding review and discussion attempted to demonstrate that the inconsistencies appearing in the literature with regard to the effect of induced mood states on memory may be, at least in part, a function of various methodological characteristics. One important point suggested by this review is that various types of mood inductions may influence memory in different ways. Moreover, it appears that indirect mood manipulations may better mimic naturally occurring moods and may produce "purer" or more interpretable mood states than more direct cognitive manipulations. Similarly, memory measures of actual life experience may be both more natural and better able to detect the influence of mood than verbal recall measures. Finally, the quality of research in this area has been limited by the neglect to include control groups and manipulation checks in research designs.

Although the above discussion suggests that indirect mood manipulations and actual life memory measures may have advantages over their counterparts, a study incorporating both of these methods has not been found in the literature. Furthermore, in order to examine adequately how different

methodologies affect study findings, comparisons must be made between direct and indirect mood induction procedures on both types of recall measures including comparison to a control group in a neutral mood. The present study, therefore, incorporated each of these features into its design to examine the differential effects of a direct and indirect mood induction procedure on recall for both verbal material and personal life memories. The overall design was therefore a 2 (direct vs. indirect mood induction) X 3 (positive, negative and neutral) factorial replicated using two dependent measures (verbal recall and actual life experience recall).

This study attempted to re-examine the phenomenon of mood-congruent retrieval while addressing some of the methodological concerns outlined above. By directly comparing the effects of a direct and indirect mood manipulation on recall for both verbal material and personal life memories we hoped to discover whether different patterns of results would emerge and shed some light on past inconsistencies in the literature. Based on the notion that the direct manipulations may have the ability to prime emotionally-toned concepts as well as alter a subjects mood, it was predicted that differential effects of induced moods on recall for both verbal material and actual life memories would be greater with the direct mood induction than with the indirect mood induction. This prediction therefore, assumes that

any influences of priming on memory are above and beyond the influences stemming from the subjects' moods.

METHOD

Subjects.

The subjects for this experiment were 180 Intoductory Psychology students at Loyola University of Chicago who participated for course credit. All subjects were randomly assigned to an experimental or control condition.

Design and Materials.

Each experimental session was carried out in 3 stages: a mood induction, a mood assessment, and a memory measure. Two types of mood inductions were used (direct or indirect), each involving a positive and negative mood manipulation and a control condition. Two types of memory measures were also used, one involving the recall of verbal material, the other requiring the recall of actual life memories. Each subject participated in only one type of mood induction, one mood or control condition, and one type of memory measure. Therefore, each subject was randomly assigned to one of 8 experimental or 4 control conditions.

Dependent Variables.

Verbal Recall Measure. At the beginning of each experimental session, subjects in the verbal recall condition were instructed to listen to a taped list of 36 words which they would be asked to recall later in the experiment.

The word list, used previously by Isen, et al (1978) and Teasdale & Russell (1983) consisted of 18 personality trait words and 18 neutral, non-trait words. (See Appendix A for the complete list). Of the 18 personality trait words, six were positively-toned, six were negatively-toned and six were neither positive nor negative in tone. The trait words were selected from a list of 555 words rated for likeableness by Anderson (1968, cited in Isen, et al, 1978 and Teasdale & Russell, 1983).

The list was presented to subjects in the following way: the first 6 words and the last 6 words were always neutral, non-trait words, with the order of the remaining 24 words counterbalanced between the 7th and 30th position in the list.

After the mood induction was complete, subjects were asked to recall as many of the words from the list as possible. They were allowed two minutes to do this.

Actual Life Memory Measure. Subjects in this condition were presented with a series of ten neutral stimulus words and asked to write down the first memory that came to mind (see Appendix B for the complete list). Subjects were

instructed that this could be any memory, even one from childhood, but that it was important that it was an actual memory and not just a current thought association.

After retrieving a memory for all ten words, subjects were asked to go back and rate each memory on a 7-point scale from +3 (extrememly happy) to -3 (extremely unhappy). These ten ratings are averaged to form an overall composite score.

Procedures.

Direct Mood Manipulation. The direct mood induction involved having subjects self-generate mood states by thinking about happy or sad personal experiences. All participants listened to a 12 minute, affect-induction recording modeled after a procedure used by Wright & Mischel (1982). The tape instructed them to imagine situations that would leave them feeling either very happy, very sad or neither happy nor sad for the control condition (see Appendix C for the complete script). At the beginning of each tape, all subjects were asked to relax, make themselves comfortable, and pay careful attention to the instructions that followed. The remainder of the tape requested that they think about either a real or hypothetical situation that would create happy, sad or neutral feelings, depending on the particular mood condition. Throughout the recording, subjects were asked to continue generating vivid imagery of the situation by

"hearing the sounds," or "seeing all the details of the situation." Participants listened to the tapes individually, wearing head phones and were told that closing their eyes may make it easier to concentrate.

Indirect Mood Manipulation. The indirect mood induction involved having subjects complete a 10-item test of visual--spatial ability, under the pretense that the experiment was a study about "problem-solving ability and memory." Following the test, subjects were asked to wait quietly while their tests were being scored. Participants in the two experimental conditions (positive or negative mood) were then given false feedback about their test performance. They received computer-generated feedback forms designed to make the feedback seem as "official" as possible. Subjects in the positive mood condition were told that their performance on the test was well above average, (a score of 8 correct, where the average score was 5). Similarly, subjects in the negative mood condition were told that their performance was well below average (a score of 2 correct, where the average score was 5). Both groups were also told that the visual-spatial test is often used as a predictor of future success in college and careers. This information was designed to enhance the "importance" of the test, and thus make it more likely to alter subjects' moods. Subjects in the control condition received no feedback about their scores or any information about the test.

Mood Assessment.

The Multiple Affect Adjective Checklist (MAACL) Today Form was administered to all participants as a manipulation check (Zuckerman & Lubin, 1965). The MAACL is a self-administered questionnaire consisting of 132 adjectives and 3 subscales designed to measure the affective states of anxiety, hostility and depression. Only the depression subscale was scored for the manipulation check.

The order of administration was counterbalanced to avoid the possibility that the checklist itself had any mood-altering properties. For subjects in the direct mood induction conditions, the MAACL was filled out either immediately following the affect induction recording, or at the end of the experimental session. Similarly, for subjects in the indirect mood induction conditions, half of them filled out the MAACL after receiving the false feedback (or after the test for the control condition), or at the end of the experimental session.

Informed consent was obtained from all participants before the experiment began. In order to avoid the possibility of experimenter bias or demand, the amount of subject-experimenter interaction was kept to a minimum across all procedures. Wherever possible, instructions were administered on paper or on tape, and the experimenter was not in the room unless necessary. Following completion of the mood induction, mood assessment and memory measure, all subjects

were debriefed, both orally and in written form.

RESULTS

Mood Induction Manipulation Check

Subjects' responses on the MAACL served as a manipulation check for both the direct and indirect mood inductions. In order to examine whether there were any differences due to the timing of the manipulation check or type of mood induction, we conducted a 3 (positive vs. negative vs. neutral) X 2 (direct vs. indirect) X 2 (early administration of the MAACL vs. late administration of the MAACL) analysis of variance (ANOVA). This analysis revealed a significant main effect of mood condition F (2,176) = 86.540, $p < .01$. No other main effects or interactions were significant. Newmann-Keuls tests indicated that all three group means differed significantly ($p < .05$). Therefore, both of the mood manipulation techniques successfully induced positive and negative mood states. (See Table 2 for group means.)

Comparison of Direct and Indirect Mood Inductions

The major question addressed in this study is whether direct and indirect mood manipulations have differential effects on memory. Underlying this question, however,

Table 2

Mean Scores and Standard Deviations on the Manipulation Check (MAACL) by Mood Group

Positive	SD	Control	SD	Negative	SD
7.72	4.83	14.63	6.58	23.98	8.26
(60)		(59)		(58)	

Note. Higher scores indicate more depressed affect.
Cell n's are in parentheses.
All three means differed significantly ($p<.05$).

is the more primary hypothesis of mood-congruent retrieval. To examine both of these questions, we conducted 2 (Type of Mood Induction) X 3 (Mood Group) ANOVA's on each of the memory measures.

Actual Life Memory Measure

For subjects completing the memory measure of actual life experiences, we investigated differences among the mean memory ratings by computing an average rating across all ten memories. Thus, a mean rating of greater than zero would indicate overall positive memories, whereas a mean rating of less than zero would indicate overall negative memories.

This ANOVA revealed no significant Mood Induction X Mood Group interaction (F (2,85) = .279, n.s.) nor a main effect of mood induction (F (2,85) = .312, n.s.). Therefore, we found no evidence to suggest that the two mood inductions are producing different effects on memory for actual life experience. (See Table 3 for cell means.)

This analysis did reveal, however, a significant main effect of mood group F (2,88) = 4.392, $p<.05$, with the positive mood group reporting the most positive ratings (mean=0.69) and the negative mood group reporting the least positive ratings (mean=0.09). A Newman-Keuls test revealed, however, that although the positive mood group differed significantly ($p<.05$) from both the negative mood group

and the controls (mean=0.22), the negative mood group did not differ significantly from the controls. Given that all of the group means are positive in sign and the positive mood group differed significantly from the control group, these data provide evidence to support a mood-congruent recall effect for positive states. The results do not, however, provide any support for a negative mood-congruent retrieval effect.

Verbal Recall Measure

A similar set of analyses were conducted using components of the verbal recall measure as dependent variables. Initially, we planned to examine differences among the total number of positive and negative words remembered from the list. However, during data coding we discovered that a large number of subjects were "recalling" words that were not on the original word list. Moreover, most of the words were positive or negative in affective tone. Because the possibility exists that the subjects mood may also have influenced or biased recall for these "extra" words, we decided to include them in our analyses.

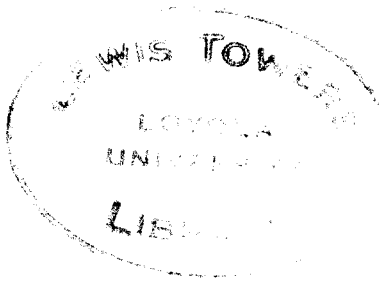
The affective tone of the "extra" words was coded by two separate judges. The inter-rater reliability on this coding was .88 ($p<.01$). Thus, six dependent variables were subsequently analyzed: the mean number of positive and negative words remembered from the list, the mean number of "extra" positive and negative words recalled, and the

Table 3

Mean Ratings and Standard Deviations on the Actual Life Experience Measure by Type of Mood Induction and Mood Group

	Pos.	SD	Cont.	SD	Neg.	SD
Direct	0.56[b] (14)	.855	0.26[a] (16)	.862	0.03[a] (15)	.759
Indirect	0.80[b] (16)	.641	0.19[a] (14)	.986	0.15[a] (14)	.727

Note. Higher means indicate more positive ratings. Cell n's are in parentheses.
Means with common superscripts do not differ reliably.



total number of positive and negative words recalled overall. Thus, six separate two-way (Mood Induction X Mood Group) analyses of variance were performed.

The two ANOVA's conducted on the mean number of positive and negative words remembered from the original list revealed no significant findings. Furthermore, examination of the "extra" negative words recalled yielded no significant results. The ANOVA on the "extra" positive words, however, did reveal some significant findings. Consistent with the results from the actual life memory measure, there was no main effect of type of mood induction (F (2,85) = .448, n.s.) and no interaction between type of mood induction and mood group (F (2,85) = .104, n.s.). There was, however, a significant main effect for mood group on the mean number of "extra" positive words recalled (F (2,85) = 4.548, $p<.001$). As expected, subjects in the positive mood group remembered more "extra" positive words than subjects in both the negative and control groups. (See Table 4 for cell means.) In addition, when these "extra" positive words were added to the positive words remembered from the list, (producing a measure of "total" positive words) the main effect of mood group was also significant (F (2,85) = 7.39, $p<.05$). Again, there was no interaction between type of induction and mood group (F (2,85) = .973, n.s.) nor a main effect of mood induction on the "total" positive words remembered (F (2,85) = .012, n.s.). (See Table 5 for cell means.)

Table 4

Mean Ratings and Standard Deviations on Extra Positive Words and Total Positive Words by Type of Mood Induction and Mood Group

	Pos.	SD	Cont.	SD	Neg.	SD
Direct						
"Extra" Positive	0.86^{a} (14)	.86	0.29^{bc} (14)	.73	0.07^{b} (15)	.25
Indirect						
"Extra " Positive	0.93^{a} (15)	1.10	0.57^{c} (14)	.65	0.14^{bc} (14)	.36
Direct						
Total Positive	1.57^{ef} (14)	1.16	1.07^{fg} (14)	1.27	0.80^{g} (15)	.86
Indirect						
Total Positive	1.67^{e} (15)	1.78	1.43^{eg} (14)	1.39	0.43^{g} (14)	.65

Note. Higher means indicate more positive ratings.
Cell n's are in parentheses.
Means with common superscripts do not differ reliably.

The pattern of means in both of the significant analyses are consistent with mood-congruent recall. Newman-Keuls tests, however, indicated that the mood-congruence only holds for positive mood. For the analysis on the mean number of "extra" positive words recalled, the results were identical to those found with the actual life memory measure: the positive mood group (mean=0.90) differed significantly ($p<.05$) from both the negative group (mean=0.10) and control group (mean=0.43), yet the other combination of means did not differ significantly. A Newman-Keuls test on the "total" number of positive words recalled found that only the positive mood group (mean=1.62) differed significantly ($p<.05$) from the negative mood group (mean=0.62). Neither the positive or negative mood group differed from the controls (mean=1.25).

DISCUSSION

The primary question addressed in this research is whether or not different types of mood inductions produce different patterns of influence on memory. Our findings provide no evidence to suggest that they do. The pattern of results with respect to mood-congruent retrieval was strikingly similar across the two types of recall measures and both types of mood inductions. Although these data allow no conlusions to be drawn concerning exactly how the mood inductions operate, they provide no evidence that the resulting effects on memory are reliably different. Overall, therefore, our results fail to support the notion that different kinds of mood inductions have contributed to inconsistencies in the literature. The predictions made in this study were based on the notion that a distinction should be made between various types of mood manipulations and their potential processes of influencing mood. Other aspects of this study's findings, however, may cast doubt on the need for such a distinction.

First, as our manipulation checks indicated, both the direct and indirect mood inductions were equally successful

in altering subjects' moods. This finding does not rule out the possibility that the direct induction technique used in our study influences memory via a cognitive component in the manipulation. It does, however, confirm the induction's ability to (1) induce both positive and negative mood states, and (2) induce a positive mood significantly strong enough to influence memory. Furthermore, because we failed to find that the resulting effects of mood on memory were any stronger for the direct induction than the indirect induction, there is less reason to believe that something other than mood is also influencing memory. In other words, if the direct induction was operating by combining the effects of cognitive priming and a mood equally as strong as with the indirect induction, we should have obtained the expected results of a stronger retrieval effect for the direct technique.

Secondly, because the pattern of results across the two types of memory measures is so similar, it seems unlikely that the direct induction is influencing memory in a completely different way than the indirect induction technique. Again, our results do not allow any statement about how the two inductions operate, yet the similarity in findings across multiple measures suggests that our results are stable to some degree.

This study also addressed the more fundamental hypothesis of mood-congruent retrieval. Consistent with much of the

previous research in this area, our findings indicate that positive mood prompts the retrieval of positive memories. Our results fail to indicate, however, that negative mood facilitates the accessibility of negative memories. The positive mood-congruent effect not only appears equally strong for subjects experiencing both direct and indirect mood inductions, but also holds across two types of dependent measures. These results are not entirely surprising given the number of studies reporting only a positive mood-congruent retrieval effect. However, several explanations seem probable. First, it is possible that past researchers who failed to use control groups and reported symmetric memory effects may have misinterprested their findings. As suggested by Blaney (1986), the negative mood groups memories in past studies may really have been more neutral than negative. In the absence of a neutral control condition it is difficult to discern what is neutral and what is negative.

In addition, some subjects unwillingness to comply with negative mood inductions may have influenced our results. When compared to subjects under direct mood manipulation, subjects under the indirect, covert manipulation, are less aware that their moods are being manipulated. Therefore, there is less reason to believe that they could influence the induction technique intentionally. However, with the direct induction, where subjects are asked to think about unhappy experiences and let these thoughts influence their

present feelings, it is possible that they may not have fully participated in the induction. Subjects could decide that they do not want to feel unhappy, and thus jeapordize the manipualtion. However, because they know that they are supposed to feel unhappy as a result of the induction procedure, they may report that they are feeling low on the manipulation check.

Finally, it may be that the mood-congruence hypothesis needs further examination. The possibility exists that the kind of mild "bad mood" experienced in everyday life does not affect recall even though "good moods" clearly do influence our memories. It may be that more intense negative affect is required to influence memory, and that laboratory manipulations are insufficient to produce strong enough moods. Alternatively, negative memories may be less likely to be retrieved, in general, making a negative mood--congruent recall effect extrememly difficult to detect.

Although a direct comparison between the two types of recall measures is not possible with our data, our analyses do seem to indicate that the verbal recall measure "as it is typically operationalized" yielded less powerful results. The pattern of results across the two recall measures is quite similar, (i.e., both indicate an asymmetric mood-congruent effect for positive states). However, the significant results on the verbal recall measure appeared only when the "extra" words were examined either alone

or in combination with the original word list. These results highlight at least one problem associated with verbal recall measures, (i.e., low baseline rates of recall) and provide some evidence to suggest that the actual life memory measures may provide more powerful results. However, this new coding method of including other words not from the original list may also change the interpretability and improve the usefulness of this measure. Further research concerning how various types of recall measures influence study findings seems important.

To summarize, our data provide stable evidence that a mood-congruent retrieval effect exists for positive states. However, we found no evidence to suggest that a similar effect exists for negative moods and memory. Furthermore, our results provide no indication that past inconsistencies in the literature may be explained by differences in the types of mood inductions employed. However, as our discussion of the findings suggests, several implications of our data seem worthy of examination. Further research in this area should include careful study of the process and operation of inducing negative moods, as well as research concerning various types of recall measures and their processes.

REFERENCES

Bower, G. H. (1981). Mood and Memory. American Psychologist, 36, 129-148.

Bower, G. H., Gilligan, S. G., & Monteiro, K. P. (1981). Selectivity of learning caused by affective states. Journal of Experimental Psychology: General, 110, 451-473.

Bower, G. H., & Mayer, J. D. (1985). Failure to replicate mood-dependent retrieval. Bulletin of the Psychonomic Society, 23, 39-42.

Bower, G. H., Monteiro, K. P., & Gilligan, S. G. (1978). Emotional mood as a context for learning and recall. Journal of Verbal Learning and Verbal Behavior, 17, 573-585.

Clark, D. M., & Teasdale, J. D. (1985). Constraints on the effects of mood on memory. Journal of Personality and Social Psychology, 48, 1595-1608.

Clark, D. M., Teasdale, J. D., Broadbent, D. E., & Martin, M. (1983). Effect of mood on lexical decisions. Bulletin of the Psychonomic Society, 21, 175-178.

Forgas, J. P., Bower, G. H., & Krantz, S. E. (1984). The influence of mood on the perception of social interactions. Journal of Experimental Social Psychology,

20, 497-513.

Gerrig, R. J., & Bower, G. H. (1982). Emotional influences on word recogniton. Bulletin of the Psychonomic Society, 19, 197-200.

Gotlib, I. H., & McCann, C. D. (1984). Construct accessibility and depression: An examination of cognitive and affective factors. Journal of Personality and Social Psychology, 47, 427-439.

Isen, A. M. (1984). Toward understanding the role of affect in cognition. In R. S. Wyer & T. K. Srull (Eds), Handbook of Social Cognition, (Vol. 3, 179-236). Hillsdale, NJ: Earlbaum.

Isen, A. M., Shalker, T. E., Clark, M., & Karp, L. (1978).- Affect, accessibility of material in memory, and behavior: A cognitive loop? Journal of Personality and Social Psychlogy, 36, 1-12.

Laird, J. D., Wagener, J. J., Halal, M., & Szgeda, M. (1982). Remembering what you feel: Effects of emotion on memory. Journal of Personality and Social Psychology, 42, 646-657.

Madigan, R. J., & Bollenbach, A. K. (1982). Effects of induced mood on retrieval of personal episodic and semantic memories. Psychological Reports, 50, 147-157.

Mathews, A., & Bradley, B. (1983). Mood and the self-reference bias in recall. Behavior, Research & Therapy, 21, 233-239.

Mecklenbrauker, S., & Hager, W. (1984). Effects of mood on memory: Experimental tests of mood-state-dependent retrieval hypothesis and of a mood-congruity hypothesis. Psychological Research, 46,355-376.

Nasby, W., & Yando, R. (1982). Selective encoding and retrieval of affectively valent information: Two cognitive consequences of children's mood states. Journal of Personality and Social Psychology, 43, 1244-1253.

Natale, M., & Hantas, M. (1982). Effect of temporary mood state on selective memory about the self. Journal of Personality and Social Psychology, 42, 927-934.

Riskind, J. H., Rholes, W. S., & Eggers, J. (1982). The Velten Mood Induction Procedure: Effects of mood on memory. Journal of Consulting and Clinical Psychology, 50, 146-147.

Snyder, M., & White, P. (1982). Moods and memories: Elation, depression, and the remembering of the events of one's life. Journal of Personality, 50, 142-167.

Teasdale, J. D., & Fogarty, S. J. (1979). Differential effects of induced mood on retrieval of pleasant and unpleasant events from episodic memory. Journal of Abnormal Psychology, 88, 248-257.

Teasdale, J. D., & Russell, M. L. (1983). Differential effects of induced mood on the recall of positive, negative and neutral words. British Journal of Clinical Psychology, 22, 163-171.

Teasdale, J. D., & Taylor, R. (1981). Induced mood and accessibility of memories: An effect of mood state or mood induction procedure? British Journal of Clinical Psychology, 20, 39-48.

Teasdale, J. D., Taylor, R., & Fogarty, S. J. (1980). Effects of induced elation-depression on the accessibility of memories of happy and unhappy experiences. Behavior, Research & Therapy, 18, 339-346.

Wright, J., & Mischel, W. (1982). Influence of affect on cognitive social learning variables. Journal of Personality and Social Psychology, 43, 901-914.

Zuckerman, M., & Lubin, B. (1965). Manual for the Multiple Affect Adjective Checklist. San Diego, California.: Education and Industrial Testing Service.

ENDNOTES

[1] Subjects were identified as responsive to either self-produced or situational cues based on their moods according to a mood adjective checklist administered after their facial expressions were manipulated. Those subjects thus classified as self-produced were the experimental group and those classified as situational served as a comparison group (see Laird, et al, 1982, 648-649).

[2] These musical mood inductions are classified as direct because subjects received instructions to try to feel the particular mood state described by the music.

APPENDIX A

APPENDIX A

List of words used for the verbal recall measure

Non-trait Neutral	Positive	Negative
novel	helpful (+)	hostile (-)
bold		
bear	thoughtful (+)	mean (-)
excitable		
television	pleasant (+)	ungrateful (-)
shy		
apricot	kind (+)	cruel (-)
cautious		
sword	friendly (+)	impolite (-)
proud		
trailer	considerate (+)	rude (-)
unconventional		
chisel		
vanilla		
rock		
jacket		
brick		
carbon		
eagle		
game		
petunia		
zinc		
grasshopper		
engineer		

APPENDIX B

APPENDIX B

List of cue words for actual life memory measure

Cue words

station
dream
public
meeting
speed
rain
sound
secret
reading
people

APPENDIX C

APPENDIX C

Affect Induction Recording Script

Please relax, make yourself comfortable, and focus your attention on the instructions you are about to hear. What we want you to do for the next several minutes is imagine a situation that would leave you feeling very happy (or sad, or neither). This can be a real situation that you have actually experienced, even an event from childhood, or it can be a hypothetical situation. What is important is that that you concentrate. You may find it helpful to close your eyes.

I would like for you to begin imagining a situation which you think would make you feel happy (sad, neither happy or sad).

(15 second pause)

Imagine the situation as vividly as you can.

(15 second pause)

Picture the events happening to you.

(15 second pause)

See all the details of the situation.

(15 second pause)

Picture in your "mind's eye" the surroundings as clearly as possible.

(15 second pause)

See the people or the objects.

(15 second pause)

Hear the sounds.

(15 second pause)

Experience the event happening to you.

(15 second pause)

Think the thoughts you would actually think in this situation.

(15 second pause)

Feel the same (happy, sad, neither) thoughts you would feel.

(15 second pause)

Let yourself react as if you were actually there.

(15 second pause)

Please continue to think about this situation for the next several minutes. If your attention starts to drift, try hard to get back to the situation. Really try to concentrate. More instructions will follow in a few minutes.

APPROVAL SHEET

The thesis submitted by Claudia Lampman-Petraitis has been read and approved by the following committee:

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The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the thesis is now given final approval by the Committee with reference to content and form.

The thesis is therefore accepted in partial fulfillment of the requirements for the degree of Master of Arts.

10/23/87
Date

Linda Heath
Director's Signature