

AN ABSTRACT OF THE THESIS OF

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PROCEDURES ON MEMORY

Abstract approved:

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Are the moods induced by two different induction techniques the same mood? Memorial effects indicate that the Velten relative to Cook's technique, may induce a different mood state, but the two have never been directly compared using the same methodology. The present study attempted this comparison. Subjects (N=64) were blocked on sex and randomly assigned to one of four treatment conditions in a 2 (Technique: Velten or Cook) X 2 (Sex: male or female) X 2 (Mood: happy or sad) X 3 (Sentence Affect: happy, sad, and neutral) mixed factor design. Mood was successfully induced. Velten's but not Cook's subjects demonstrated better recall for sentences congruent with the mood at

encoding. Subjects made happy with the Cook in contrast to Velten's technique recalled more sad sentences. Cook females exposed to the Cook mood induction technique regardless of mood recognized more sentences than their male counterparts. It appears that the mood induced by the different techniques may be qualitatively different. Interestingly, the difference seems more pronounced for the happy than sad moods.

THE EFFECTS OF DIFFERENT MOOD INDUCTION PROCEDURES ON
MEMORY

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CHAPTER 1

INTRODUCTION

The induction of Velten's (1968) laboratory analogues of depressed, happy and neutral moods requires subjects to read, think about, and then read again a series of 60 self-referent statements appropriate in tone and content to the mood being induced. The self-referent statements range in intensity from "Today is neither better nor worse than any other day" to "God I feel great!" for the happy mood, and "Today is neither better nor worse than any other day" to "I want to go to sleep and never wake up" for the depressed mood. Velten's procedure is a non-hypnotic way of inducing mood based on the notion that emotions are caused by inner thought(s) or "self-talk" about particular experiences, rather than the experiences themselves (Ellis, 1963).

The effectiveness of Velten's induction procedure (VIP) has been demonstrated repeatedly. For example, Teasdale and Fogarty (1979) used the VIP to study the effects of induced happy and depressed moods on accessibility. After mood induction, subjects were presented with a stimulus word and asked to recall memories of pleasant and unpleasant past personal

explain what Velten's

support for effectiveness

experiences. Pleasant memories were less accessible in the depressed state than in the happy state. In a similar study, Teasdale, Taylor, and Fogarty (1980) used the VIP to make subjects feel elated or depressed. Subjects were then given a stimulus word to cue memories of past personal experiences. Once in a neutral mood, subjects rated the pleasantness. Retrieval of happy memories were decreased and unhappy ones increased.

In contrast to using self-referent statements, Cook and Weaver's (1986a) mood induction procedure (CIP) combined music, facial feedback, and suggestion in a combination that may tap several processes important in inducing mood, such as physiological determinants (e.g. heart rate and respiration), past memories, and association with characters. Clark (1983) demonstrated that music could effectively induce mood and subsequently increase the recall of experiences congruent with the tone of the music. Clark and Teasdale (1985) reported that subjects remembered more negative than positive words while listening to depressing music, whereas their elated counterparts recalled more positive than negative words. Laird, Wagener, Halal, and Szegda (1982) developed a mood induction technique based on facial feedback which

Explanation of Cook's procedure

Support for success

involved maintaining a frown, smile, or some other facial expression for a set period of time so as to induce the mood. In the first of two studies conducted by Laird et al. (1982), two groups of subjects read either sad editorials or humorous anecdotes while maintaining a neutral facial expression. Recall was significantly better for the sad editorials when frowning during retrieval and for the humorous anecdotes when smiling.

Mood has also been induced using hypnotic suggestion (Bower, 1981). Subjects were asked to recollect and then reexperience some happy or sad event, reliving the emotion felt at the time and retaining it while performing some task. Bower, Gilligan, and Monteiro (1981) used hypnosis to induce mood and then exposed subjects to simulated psychiatric interviews of a patient talking about happy and sad incidents from his childhood. At recall, subjects who had read the story while happy recalled more happy than sad incidents, whereas sad readers recalled more sad than happy incidents.

Music, facial feedback, and hypnosis as induction techniques, however, have problems. Prior to the music mood induction, subjects were instructed to think of

Other Mood Induction

memories or events that were congruent to the affect of the music, potentially imposing demand characteristics on the subjects. Facial feedback on the other hand, has only been effective for people described as basing their self-knowledge more on cues from their own behavior (self-producing cues) than on cues from the environment (situational cues) (Laird et al., 1982). Similarly, only 25% of the population are amenable to hypnosis. Thus, the latter two induction techniques potentially eliminate many people and compromise the generalizability of any results (Cook & Weaver, 1986a). Furthermore, those who can be hypnotized may also comply with demand characteristics (Bower, 1981). Cook and Weaver (1986a) reported that a combination of the above three procedures (i.e., listening to music and a story while maintaining an affectively congruent facial expression) produced a 90% rate of successful induction without having to encourage the subjects prior to induction to feel a certain way. The success rate has been validated in subsequent research (e.g., Weaver, McNeill, Van Dillen, & Arganbright, 1988).

With reliable induction techniques, cognitive researchers have attempted to assess the effects of emotion on memory. This line of inquiry led Bower

problems inherent in each technique

problems inherent in each technique

(1981) to modify the semantic network theory of memory (Collins & Loftus, 1975; Collins & Quillian, 1972). He included emotions as concepts to which memorial representations of congruent events, facial expressions, autonomic responses, and other emotion related information are linked. Excitation of an emotion (i.e., feeling an emotion) activates this associated information. In turn, activation of any associated information can excite the emotion node.

One prediction from Bower's modification is the mood congruity effect, which predicts better recall of material affectively congruent to the person's mood at encoding. Bower and Cohen (1982) have proposed that affectively congruent information is elaborated more by the information stored in long-term memory and activated by the mood state. The interconnections that form between the input and memorial information become potential retrieval cues at recall (Anderson & Reder, 1979). The more retrieval cues formed at encoding, the better the likelihood of reinstating them at recall (Tulving & Thomson, 1973). It is important to note that mood congruity is unlike mood state dependence in that the mood at retrieval is neutral rather than matching the encoding mood.

Mood congruity has been empirically supported. Bower et al. (1981) had happy and sad subjects read a brief story containing happy and sad idea units. The next day subjects in a neutral mood recalled more ideas congruent with their encoding mood. Weaver (1986) made subjects feel happy, sad, or neutral after which they affectively appraised happy, sad, and neutral sentences. After neutral retrieval mood induction, females clearly demonstrated mood congruity and males marginally so. In a similar study, Weaver et al. (1988) had happy and sad subjects affectively appraise and after neutral mood induction recall 36 sentences. Females in this study also showed mood congruity.

A factor influencing both mood and memory is sex. Velten (1968) used only females as subjects because "women and girls are slightly more suggestible than men and boys" (Weitzenhoffer, 1953, p. 77). More recent studies use both males and females, and some (e.g., Weaver, 1986; Weaver et al., 1988) have reported no sex differences for induced mood.

Cook and Weaver (1986b) reported that females recalled more idea units than males. In addition, although recall did not differ between males and females who were in a happy mood, recall was better for sad and

Support for mood congruity

neutral mood females than their male counterparts. Weaver (1986) in his dissertation, reported that females recalled more than males. Weaver et al. (1988) reported that greatest recall was obtained for sad sentences appraised by sad females. Bower et al. (1978) reported that "males showed a somewhat larger effect of mood congruency than did females" (p. 582).

Both Velten's (1968) and Cook's (1986a) techniques have been effective at inducing happy and sad moods, but it is not clear whether the induced moods are the same. Ellis, Thomas, and Rodriguez (1984), using the Velten technique, suggested that sadness impairs cognitive effort, thus reducing elaboration and subsequently decreasing recall. Bower (1981) and Weaver (1986), on the other hand, suggest that sadness facilitates the elaboration of sad material thus increasing its recall. The two ideas support different predictions about memory (especially for sad subjects) but have been tested by two different mood induction techniques. Consequently, the Velten technique has never been tested in a methodology designed to produce the mood congruity effect (Bower, 1981). Furthermore, it is unclear whether the different results are attributable to the different mood induction techniques or the different

methodologies. The purpose of the present study is to compare the effects of the Velten and Cook happy and sad mood inductions with a methodology designed for producing mood congruity. The present study attempts to answer the following research question: Will males and females exposed to the Velten or Cook techniques differentially remember happy and sad sentences?

CHAPTER 2

METHOD

Subjects

The subjects were 64 volunteer Introductory Psychology students from Emporia State University of which 32 were male and 32 female.

Design

Subjects were blocked on sex and randomly assigned to one of eight conditions resulting from a 2 (Mood: happy or sad) x 2 (Technique: Velten or Cook) x 2 (Sex: male or female) x 3 (Sentence Affect: happy, sad, and neutral) mixed factorial design. Mood, Technique, and Sex were between subjects, and Sentence Affect, a within subjects independent variable. Memory was first measured by sentence recall operationalized as the number of sentences correctly recalled by each subject for each affective category. The second dependent measure, recognition, was operationalized as the number of correctly selected target sentences minus the number of false alarms (i.e., foils labeled as target sentences). The subject's mood was evaluated at three points during the study: prior to the experiment, after the induction of the encoding mood, and after the induction of the retrieval mood.

Materials

Consent and Demographic Form. A consent form (see Appendix A) was typed on 8 1/2 x 11" white paper. Included on the form was a brief description of the study and questions asking subjects how their day had been, age, place of residence, major, and number of classes and exams they had had that day. Also included was the preinduction assessment scale which is a 7 point Likert type scale ranging from very happy (1) to very sad (7).

Postinduction Mood Scales. A modified Wessman and Ricks (1966) Elation-Depression Scale with "happy" and "sad" substituted for "elation" and "depression" was typed on 8 1/2 x 11" white typing paper. The scale contained 11 sentences (see Appendix B).

Mood Induction Procedures. The present study used the abbreviated version of Velten's (1968) technique proposed by Teasdale and Fogarty (1979). This version used 15 of Velten's (1968) 60 self-referent statements. The 15 statements were randomly selected, one from each cluster of four consecutive statements in the original Velten procedure (see Appendix C). Each statement was typed in capital letters on an unlined index card. For each card, subjects had 16 seconds to read the statement

to themselves, think about it, and read it again aloud, trying to feel the mood suggested by the statement. Neutral retrieval mood was 15 neutral statements.

Cook's mood induction procedure required that subjects, depending on their randomly predetermined condition, first be instructed to "smile while you listen carefully to the music and story" (happy mood induction) or "frown while you listen carefully to the music and story" (sad mood induction) (see Appendix D for text of stories). Happy subjects then listened to a two minute excerpt of "Coppelia" written by Leo Delibes and played by the Orchestre du Theatre National de l'Opera on the Angel label. The sad mood group listened to two minutes of "Russia Under the Mongolian Yoke" from Alexander Nevsky, written by Sergei Prokofieff, played by the Reiner/Chicago symphony on the RCA label, and recorded at half speed. The next part of the tape contained a two minute biographical sketch (adapted from the Paul Smith story in Bower, Gilligan, & Monteiro, 1981) about either a happy, sad, or neutral female or male (see Appendix D). The sketches were fictional self-reports, approximately 250 words long, of an individual's life. There were two versions of each sketch; one about a female character recorded by a

female actress and one about a male character recorded by a male actor. Neutral retrieval mood involved listening to scales being played on a piano and a story.

Stimulus Sentences. The to-be-remembered stimuli in the present study were 36 happy, sad, and neutral sentences (see Appendix E) that were selected from a pool of stimulus sentences which were affectively rated by students similar to the ones used in the present study. The 12 sentences in each category rated as the best were selected as the stimuli.

All sentences were written in the active voice, consisting of subject, verb, object, and prepositional phrase, and ranging in length from eight to nine words. They contained no personal pronouns or any reference to a particular gender. These sentences were randomly ordered such that no three of the same affect appear consecutively. Two neutral sentences were added to the beginning of the stimuli as practice and to control for the primacy effect (Glanzer & Cunitz, 1966).

Filler Task. A one minute filler task consisting of circling threes on a table of random numbers was administered immediately after the last stimulus sentence was presented (see Appendix F).

Recall and Recognition Task. Recall required one

sheet of 8 1/2 by 11" white, lined, notebook paper and a pencil. The recognition task in the present study was 36 happy, sad, and neutral sentences selected from a pool of sentences rated by students in a study similar to the present one. For recognition, the 36 stimulus sentences and 36 distracters were randomly ordered and typed on sheets of 8 1/2 x 11" white typing paper (see Appendix H).

Apparatus. An Eazy-20 (#9515722) personal computer and Zenith black and white 11" monitor were used to present the two practice and 36 stimulus sentences. Two keys (V and M) were designated to make the happy and sad judgments. A Sony cassette tape player (model# PHP-2700) with Sony headphones (model# A-0483) were used to present the music and story.

Procedure. All instructions were given before mood was induced (see Appendix G for script). All subjects, individually run by a 23 year old white male experimenter, and were first introduced to the various pieces of equipment. They were then instructed to read and sign a consent form and complete a brief biographical questionnaire.

After the paper was removed, subjects assigned to the Cook procedure were told that a pair of adjustable

headphones would be given to them and some music followed by a story would be presented. Subjects were instructed to listen carefully to both and maintain a natural smile or frown for as long as the music and story lasted. They were then asked to demonstrate the facial expression. Subjects assigned to the Velten procedure were told that statements would be presented one at a time every 16 seconds indicated by a tone. They were told to try and feel the mood suggested by the statement as they read it to themselves, thought about it, and read it again aloud.

After the above, all subjects were instructed to pull out the keyboard to a comfortable position after they finished reading the statements. Subjects were told to place the index fingers of each hand on the marked keys of the keyboard and to press the space bar when they were ready to begin the display of stimulus sentences. The sentences were displayed individually for a set period of time. Subjects were told to read them carefully, decide whether the sentences were happy or sad, and then press H for happy or S for sad. Subjects in the Cook condition were instructed that a story would be heard with the headphones. Subjects in the Velten technique were given 15 neutral statements to

read. Subjects were then asked if there were any questions.

After questions were answered, the study began. As soon as the mood inductions were finished, all subjects completed the Wessman and Ricks scale by reading the 11 statements and circling the one that corresponded to how they currently felt. All subjects then read and appraised the stimulus sentences with their respective mood induction procedures. After all stimulus sentences were appraised, subjects completed a one minute filler task consisting of circling as many of the number "3's" as possible on a sheet of random numbers to clear short-term memory. They were then exposed to a neutral mood induction, after which subjects completed the second administration of the Wessman and Ricks (1966) mood scale.

Immediately upon completion of the retrieval mood induction scale, the experimenter gave the subjects a sheet of paper and asked them to write down as many of the sentences they could remember that had been displayed on the computer screen. Subjects were told to write down all fragments of the sentences even if they were not sure the information had been presented. Subjects had five minutes to complete this exercise

which was followed by a recognition task that required them to circle "yes" if the sentence had been presented on the computer screen or "no" if it had not. At the end of the experiment, subjects were thanked for their participation and debriefed. Through debriefing and questioning, all subjects left in a neutral to positive mood (see Appendix G).

Scoring and Statistics. Two judges scored the recall protocols independently for gist, and any discrepancies were resolved by coming to an agreement on the scoring. For the recognition task, each target sentence was scored correct if it was recognized as one of the original stimulus sentences displayed. One-quarter point was given for each sentence part recalled (subject, verb, object, and prepositional phrase). A target recognition score was obtained by adding the total correctly recognized stimulus sentences minus the total missed for each of the three affect categories. The maximum possible correct was 12 for each category or 36 overall.

The data was analyzed using a 2 (Mood: happy or sad) x 2 (Technique: Velten or Cook) x 2 (Sex: male or female) x 3 (Sentence Affect: happy, sad, and neutral) mixed factorial analysis of variance design in which

Mood, Technique, and Sex was a between subjects factor and Sentence Affect a within subjects factor. Specific comparisons, when appropriate, were accomplished by using the Fisher's least significant difference.

CHAPTER 3

RESULTS

The present study was designed to assess the differential effects of two different mood induction techniques and gender on recall of happy, sad, and neutral sentences. Mood state was measured three times in the present study: after signing the consent form, after encoding mood induction, and after inducing the neutral retrieval mood. Each measure was separately analyzed by a 2 (Technique: Velten or Cook) x 2 (Sex: male or female) x 2 (Mood: happy or sad) between subjects analysis of variance.

The ANOVA on the preinduction mood scores failed to yield any statistically significant main effects or interactions (see Table 1 for means and standard deviations). The overall mean of 3.11 on a 1 (sad) to 7 (happy) scale indicated that subjects were in a slightly sad to neutral mood when beginning the experiment.

The ANOVA for the encoding mood ratings revealed statistically significant main effects for Sex, $F(1, 63) = 7.00, p < .01$; and Mood, $F(1, 63) = 191.86, p < .001$. The Technique X Sex X Mood interaction was also significant, $F(1, 63) = 4.09, p < .05$. Overall, females reported feeling less neutral ($M = 6.50$) than did the

Table 1
Means and Standard Deviations
Premood Rating Scale*
Technique by Sex by Mood

	Velten			Cook			Overall
	Happy	Sad	Total	Happy	Sad	Total	
Female	2.75 (.89)	3.25 (1.39)	3.00 (1.14)	3.00 (1.19)	2.87 (.64)	2.93 (.91)	2.96 (1.02)
Male	3.12 (.83)	3.00 (.75)	3.06 (.79)	3.37 (.74)	3.50 (1.19)	3.43 (.96)	3.24 (.87)
Total	2.93 (.86)	3.12 (1.07)	3.03 (.96)	3.18 (.96)	3.18 (.91)	3.18 (.93)	3.11 (.94)

* Scale ranged from 1 (very sad) to 7 (very happy).

males ($M= 6.00$). Happy mood scores ($M= 7.62$) were higher than sad mood ($M= 4.84$). See Table 2 for the means and standard deviations.

The three way interaction was further analyzed using Fishers least significant difference (LSD) test set at the $p. < 05$ level. Females made sad by the Velten technique did not become as sad as subjects in the three other sad conditions (see Table 3). No differences existed among the four happy groups.

The third $2 \times 2 \times 2$ analysis of variance on retrieval mood failed to reveal any statistically significant findings (see Table 4 for means and standard deviations). The overall mean of 6.62 indicated that all subjects were in a neutral to slightly happy mood at recall. Overall, no differences among the treatment conditions were evident at the beginning of the experiment and after the neutral retrieval mood induction.

Recall scores were analyzed with a 2 (Technique: Velten or Cook) $\times 2$ (Sex: male or female) $\times 2$ (Mood: happy or sad) $\times 3$ (Sentence Affect: happy, sad, and neutral) mixed factor analysis of variance. The within subjects factor was Sentence Affect. See Table 5 for means and standard deviations. A significant main

Table 2
Means and Standard Deviations
Encoding Mood Rating*
Technique by Sex by Mood

	Velten			Cook			Overall
	Happy	Sad	Total	Happy	Sad	Total	
Female	7.87 (1.12)	5.62 (1.19)	6.74 (1.15)	7.87 (.64)	4.62 (.52)	6.24 (.58)	6.49 (.86)
Male	7.62 (.74)	4.50 (.75)	6.06 (.74)	7.12 (.64)	4.62 (.52)	5.87 (.58)	6.00 (.66)
Total	7.74 (.93)	5.06 (.97)	6.40 (.95)	7.50 (.64)	4.62 (.52)	6.05 (.58)	6.24 (.76)

* Scale ranged from 1 (very sad) to 11 (very happy).

Table 3
 Technique by Sex by Mood Interaction
 Encoding Mood

Conditions and their means:

VMS	CFS	CMS	VFS	CMH	VMH	CFH	VFH
4.50	4.62	4.62	5.62	7.12	7.62	7.87	7.87

Legend:

Technique:

V= Velten C= Cook

Sex:

M= male F= female

Mood:

S= sad H= happy

Means underlined are not significantly different.

Table 4
Means and Standard Deviations
Retrieval Mood*
Technique by Sex by Mood

	Velten			Cook			Overall
	Happy	Sad	Total	Happy	Sad	Total	
Female	6.50 (1.07)	6.50 (1.31)	6.50 (1.19)	6.62 (.74)	6.75 (.46)	6.70 (.60)	6.60 (.89)
Male	6.62 (.92)	6.62 (.92)	6.62 (.92)	6.75 (1.03)	6.62 (.52)	6.70 (.77)	6.66 (.84)
Total	6.56 (.99)	6.56 (1.11)	6.56 (1.05)	6.70 (.88)	6.70 (.49)	6.70 (.68)	6.63 (.86)

* Scale ranges from 1 (very sad) to 11 (very happy).

Table 5
Means and Standard Deviations
Sentence Recall

Technique by Sex by Mood by Sentence Affect

Sentence Affect	Velten			Cook			Overall
	Happy	Sad	Total	Happy	Sad	Total	
Female							
Happy	2.12 (1.53)	1.75 (.82)	1.93 (1.17)	2.19 (1.54)	2.19 (.85)	2.19 (1.19)	2.06 (1.18)
Sad	1.28 (.78)	2.19 (1.35)	1.73 (1.06)	2.44 (1.15)	2.28 (1.10)	2.36 (1.12)	2.04 (1.09)
Neutral	1.44 (.73)	0.69 (.56)	1.10 (.64)	1.06 (2.16)	1.62 (.77)	1.34 (1.46)	1.22 (1.05)
Total	4.84 (3.04)	4.63 (2.73)	4.76 (2.87)	5.69 (4.85)	6.09 (2.72)	5.89 (3.77)	5.32 (3.32)
Male							
Happy	1.66 (.98)	1.50 (.74)	1.58 (.86)	1.56 (.80)	1.53 (1.43)	1.54 (1.11)	1.56 (.98)
Sad	1.78 (.70)	1.56 (1.02)	1.67 (.86)	2.22 (1.23)	1.34 (1.01)	1.78 (1.12)	1.72 (.99)
Neutral	0.72 (.77)	1.22 (1.06)	0.97 (.91)	0.69 (1.01)	1.22 (1.00)	0.95 (1.00)	0.96 (.95)
Total	4.16 (2.45)	4.28 (2.82)	4.22 (2.63)	4.47 (3.04)	4.09 (3.44)	4.27 (3.24)	4.24 (2.93)
Overall	4.50 (2.74)	4.45 (2.77)	4.49 (2.75)	5.08 (3.94)	5.09 (3.08)	5.08 (3.50)	4.78 (3.12)

effect was obtained for Sex, $F(1, 63) = 3.86, p < .05$. Females ($M=5.34$) recalled more sentences than males ($M=4.21$).

Sentence Affect was also significant $F(2, 128) = 13.15, p < .0001$. A LSD test performed on the three means revealed that more happy ($M=3.68$) and sad ($M=3.69$) relative to neutral ($M=2.18$) sentences were recalled. Happy and sad sentence recall did not differ.

The Technique by Mood by Sentence Affect interaction was borderline significant, $F(2, 128) = 2.56, p < .08$. The interaction was further analyzed by the LSD; results are presented in Table 6. The important result was that subjects made happy with the Cook relative to Velten's technique (CH) recalled more sad sentences (see Table 6).

A 2 x 2 x 2 between subjects analysis of variance was performed on recognition scores (see Table 7 for means and standard deviations). Only the Technique by Sex interaction was statistically significant, $F(1, 63) = 4.86, p < .05$. The LSD test revealed that the means of females ($M=64.93$) and males ($M=66.43$) exposed to the Velten technique and females ($M=66.99$) exposed to the Cook technique recognized more sentences than males ($M=63.24$) exposed to the Cook technique (see Tables 7 and 8).

Table 6
 Technique by Mood by Sentence Affect Interaction
 Sentence Recall

Conditions and their means:

CHn	VSn	VHn	CSn	VHs	VSh	CSs	VSs	CSh	VHh	CHh	CHs
.88	.95	1.13	1.41	1.47	1.66	1.81	1.83	1.86	1.89	1.95	2.27

Legend:

Technique:

V= Velten C= Cook

Mood:

H= happy S= sad

Affect of Sentences:

h= happy s= sad n= neutral

Means underlined are not significantly different.

Table 7
Means and Standard Deviations
Sentence Recognition
Technique by Sex by Mood

	Velten			Cook			Overall
	Happy	Sad	Total	Happy	Sad	Total	
Female	64.62 (5.42)	65.25 (4.06)	65.93 (4.74)	67.37 (3.74)	66.62 (4.27)	67.00 (4.00)	66.46 (4.37)
Male	66.87 (2.85)	66.00 (3.07)	66.43 (2.96)	64.62 (4.87)	61.87 (7.88)	64.26 (6.37)	65.34 (4.66)
Total	65.74 (4.30)	65.62 (3.56)	65.68 (3.84)	65.99 (4.30)	64.24 (6.07)	65.63 (5.18)	65.65 (4.51)

Table 8
Technique by Sex Interaction
Recognition

Conditions and their means:

CM	VF	VM	CF
63.24	<u>64.93</u>	66.43	<u>66.99</u>

Legend:

Technique:

V= Velten C= Cook

Sex:

M= male F= female

Means underlined are not significantly different.

CHAPTER 4

DISCUSSION

The rationale for the present study was derived from two opposing theoretical positions about mood's effect on memory. The first position maintained that memory is poorer for sad relative to happy people and for sad relative to happy material (Ellis et al., 1984). The second position (Bower, 1981; Bower & Cohen, 1982; Bower et al., 1981; Gilligan & Bower, 1984) proposes that the relationship between mood and memory is one of mood congruity, that is, better memory for material congruent in affect with the person's mood at encoding, regardless of the mood state.

The two positions have been supported by methodologies different in their selection of a mood induction technique. The first position is based on evidence using the Velten technique, whereas data to support mood congruity has been obtained using both hypnosis and a combination of suggestibility, facial feedback, and music. One explanation, then, for the different data is that the mood induction techniques could be actually inducing "different" mood states. The present study was an attempt to directly compare the

effects that the two different states have on recall of happy, sad, and neutral sentences, using mood measures and memory data to determine whether the two moods induced the same mood state.

Mood

The analysis of the initial preinduction measure, encoding mood, and retrieval mood, suggests that both Velten's and Cook's techniques were similarly effective in differentially inducing mild happy, sad, and neutral mood states. As can be seen from the means and standard deviations in Tables 1, 2, and 4, encoding mood significantly differed for subjects in the happy and sad mood conditions, whereas no mood differences existed in the preinduction and neutral retrieval mood scores. In addition, inducing a neutral mood immediately prior to recall seemed to ensure that any differential effect of mood on memory could be more clearly attributed to the mood at encoding, and not retrieval.

Sad females exposed to Velten's sad induction did not become as sad as either their male counterparts or the subjects exposed to Cook's sad technique. Velten used only females in his dissertation research because they were considered to be more suggestible (Weitzenhoffer, 1953); yet, here the males were sadder

than the females. In the present study, sad subjects were included if they experienced a lowering of mood state as compared to their preinduction status. For example, two subjects who experienced a drop from very happy to little happy were included in the analyses.

Memory

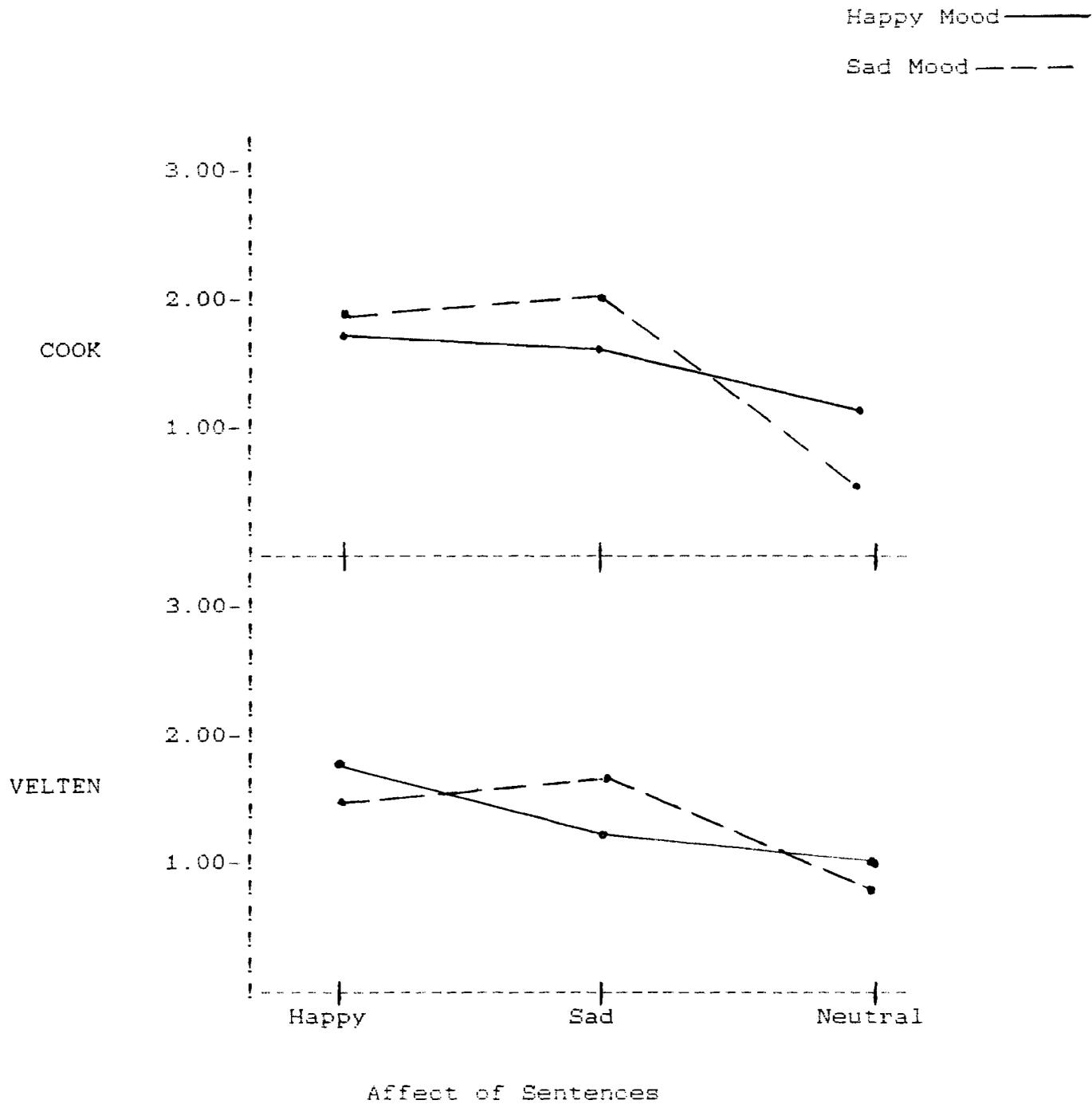
In this study, recall provided a basis by which to evaluate the similarity or differences between induced mood states. If the moods induced by the different techniques are similar, then their effects on memory should also be similar. In particular, mood congruity has been obtained using Cook's mood induction procedure. In the present study, Velten's technique was subjected to the same methodology necessary to elicit mood congruent recall.

Overall, females recalled more than males. These results are consistent with others studies (e.g. Weaver 1986; Weaver et al., 1988) that support women's proclivity for verbal material (Sherman, 1978). Somewhat surprising, Cook's technique did not produce the mood congruent effect as expected; however, Velten's technique did (See Figure 1). The use of the Velten technique in a mood congruent methodology can produce mood congruent memory. Thus, it is possible for

Figure 1

Technique by Mood by Sentence Affect Interaction

Recall



subjects made sad by the Velten technique to realize greater recall for sad than for happy sentences, suggesting elaboration of the sad sentences and the presence of at least some cognitive effort (cf Ellis et al. 1984). Velten mood induction in the present study used only 15 of the 60 statements whereas subjects in Ellis et al. (1984) read all 60. It is conceivable, then, that only mild sadness was induced by reading the 15 statements, whereas reading the 60 statements produces a more depressed like state characterized by diminished cognitive effort and poorer memory.

Subjects whose moods were induced by Cook's technique did not demonstrate mood congruity primarily because Cook's happy relative to sad subjects recalled more sad sentences. The results suggest that the quality of the moods induced, at least as reflected in the recall data, do differ. The recognition results also imply a difference in the techniques but not in the individual moods.

Given the implication of this study's results, the author proposes as a next study a replication with several design changes. For example, an equal number of happy, sad, and neutral distractor sentences and target

sentences would be used for the recognition task. It may be that recognition is better for sentences similar in affect to the mood induced. Another suggestion is to measure latency to appraise which would provide more information as to the effects of the mood induced on sentence appraisal. Finally, the Velten technique used in this study was an abbreviated version. Results support the induction of a mild mood. However, using Velten's original 60 statements for mood induction may produce a more intense mood state. Determining the effects on memory of a more intense mood state using the mood congruent methodology might be informative.

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Appendix B

Wessman and Ricks Scale

Please read all the following statements, then circle the number that corresponds to how you feel now.

1. Utter sadness and gloom. Completely down. All is black and leaden.
2. Tremendously sad. Feeling terrible, miserable, "just awful."
3. Sad and feeling very low. Definitely "blue."
4. Spirits low and somewhat "blue."
5. Feeling a bit low. Just so-so.
6. Feeling neutral.
7. Feeling pretty good, "O K."
8. Feeling very good and cheerful.
9. Happy and in high spirits.
10. Very happy and in very high spirits. Tremendous delight and buoyancy.
11. Complete happiness. Rapturous joy and soaring ecstasy.

Appendix C

15 Happy Self-Referent Statements

Card 1

TODAY IS NEITHER BETTER NOR WORSE THAN ANY OTHER DAY

Card 2

IF YOUR ATTITUDE IS GOOD, THEN THINGS ARE GOOD, AND MY
ATTITUDE IS GOOD

Card 3

I'M GLAD I'M IN COLLEGE-----IT'S THE KEY TO SUCCESS
NOWADAYS

Card 4

IT'S ENCOURAGING THAT AS I GET FARTHER INTO MY MAJOR,
IT'S GOING TO TAKE LESS STUDY TO GET GOOD GRADES

Card 5

I FEEL ENTHUSIASTIC AND CONFIDENT NOW

Card 6

MY FAVORITE SONG KEEPS GOING THROUGH MY HEAD

Card 7

I'M FULL OF ENERGY, AND AM REALLY GETTING TO LIKE THE
THINGS I'M DOING ON CAMPUS

Card 8

IT WOULD REALLY TAKE SOMETHING TO STOP ME NOW!

Card 9

I'M TOO ABSORBED IN THINGS TO HAVE TIME FOR WORRY

Card 10

THINGS LOOK GOOD

Card 11

I FEEL AN EXHILARATING ANIMATION IN ALL I DO

Card 12

MY THINKING IS CLEAR AND RAPID

Card 13

LIFE IS SO MUCH FUN; IT SEEMS TO OFFER SO MANY SOURCES
OF FULFILLMENT

Card 14

THIS IS GREAT-----I REALLY DO FEEL GOOD I AM ELATED
ABOUT THINGS

Card 15

GOD. I FEEL GREAT!

15 Sad Self-Referent Statements

Card 1

I FEEL A LITTLE LOW TODAY

Card 2

I CAN REMEMBER TIMES WHEN EVERYBODY BUT ME SEEMED FULL
OF ENERGY

Card 3

I DO FEEL SOMEWHAT DISCOURAGED AND DROWSY-----MAYBE
I'LL NEED A NAP WHEN I GET HOME

Card 4

JUST A LITTLE BIT OF EFFORT TIRES ME OUT

Card 5

JUST TO STAND UP WOULD TAKE A BIG EFFORT

Card 6

I'M GETTING TIRED OUT

I CAN FEEL MY BODY GETTING EXHAUSTED AND HEAVY

Card 7

I WANT TO GO TO SLEEP-----I FEEL LIKE JUST CLOSING MY
EYES AND GOING TO SLEEP RIGHT HERE

Card 8

I FEEL WORN OUT

MY HEALTH MAY NOT BE AS GOOD AS IT'S SUPPOSED TO BE

Card 9

THINGS ARE WORSE NOW THAN WHEN I WAS YOUNGER

Card 10

I FEEL TIRED AND DEPRESSED; I DON'T FEEL LIKE WORKING
ON THE THINGS I KNOW I MUST GET DONE

Card 11

I FEEL HORRIBLY GUILTY ABOUT HOW I'VE TREATED MY PARENTS
AT TIMES

Card 12

IT TAKES TOO MUCH EFFORT TO CONVINCING PEOPLE OF ANYTHING
THERE'S NO POINT IN TRYING

Card 13

I JUST DON'T CARE ABOUT ANYTHING
LIFE JUST ISN'T ANY FUN

Card 14

EVERYTHING SEEMS UTTERLY FUTILE AND EMPTY

Card 15

I WANT TO GO TO SLEEP AND NEVER WAKE UP

15 Neutral Self-Referent Statements

Card 1

JAPAN WAS ELECTED TO THE UNITED NATIONS ALMOST FOURTEEN
YEARS AFTER PEARL HARBOR

Card 2

THIS BOOK OR ANY PART THEREOF MUST NOT BE REPRODUCED IN
ANY FORM

Card 3

MANY STATES SUPPLY MILK FOR GRAMMAR SCHOOL CHILDREN

Card 4

THE ORIENT EXPRESS TRAVELS BETWEEN PARIS AND ISTANBUL

Card 5

THERE ISN'T A SCIENTIFIC EXPLANATION FOR EVERY U.F.O.
SIGHTING

Card 6

THERE IS A SMALL ARTICLE IN THE LOCAL NEWSPAPER WHICH

INDICATES ACCEPTANCE OF THE KIDNAPPERS' TERMS

Card 7

99.1% OF ALASKA IS OWNED BY THE FEDERAL GOVERNMENT

Card 8

A RECENT STUDY REVEALED THAT ONE HALF OF ALL COLLEGE
STUDENTS WERE UNABLE TO FIND SUMMER JOBS

Card 9

WEST SOMOA GAINED ITS INDEPENDENCE IN 1965

Card 10

THE SPEAKER OUTLINED A PLAN WHEREBY THE CURRENT DEFICITS
COULD BE ELIMINATED

Card 11

NO MAN WORKED HARDER THAN HE

Card 12

BOEING'S MAIN PLANT IN SEATTLE EMPLOYS 35,000 PEOPLE

Card 13

IT WAS THEIR SIXTH CONSECUTIVE BEST SELLER

Card 14

CHANGES WERE MADE IN TRANSPORT OF LUMBER AFTER THE
BORDER INCIDENT

Card 15

THE CHINESE LANGUAGE HAS MANY DIALECTS, INCLUDING
CANTONESE, MANDARIN, AND WU

Appendix D

Text of Stories Used For Mood Induction

Happy Mood Story

This is a brief summary of Bob/Beth Jones' life story as recalled at age twenty during two interviews:

Bob/Beth initially recalled some happy experiences at the age of four. He/she recalled the uttermost happiness of playing with his/her family at home. He/she recalled the glee and fascination when he/she rode piggyback on his/her father's back, seeing the broad smile glistening on his/her mother's face as he/she watched, and the joyous, exuberant laugh of his/her brother's voice in the background. He/she also recalled the giggles of his/her sibling as they lay awake at night telling lighthearted jokes, the happiness of his/her grandmother's face at one of his/her festive birthday parties, and the delight and joy present at holiday family gatherings.

Bob/Beth arrived relatively animated for the second interview, and reported of his/her early teenage years. He/she recalled a jubilant backpacking outing in the mountains during the fall season, a fun-filled beer

party with his/her close friends from school, the elation in hearing his/her first rock and roll record album, and the exhilarating high he/she felt in going to his/her first rock concert.

Other memories quickly flashed through his/her awareness: the delight of meeting an old friend, the jubilation of witnessing a last-second victory in an exciting football game, and the hilarious performance he saw of a stage comedian in a night club. Bob/Beth experienced himself/herself as a passive but involved observer to these fleeting incidents. However, as the story ended, he/she knew a shift inside of him/her had occurred. Because of the overwhelming cheerfulness of his/her story, Bob/Beth felt extremely happy as he/she concluded the interviews.

Sad Mood Story

This is a brief summary of Bob/Beth Jones' life story as recalled at age twenty during two interviews:

Bob/Beth initially recalled some sad experiences at the age of four. He/she recalled the overwhelming sadness when his/her dog was run over by a car, his/her grief at his/her grandfather's death, and the despair of

watching a hard-earned quarter seep through the grating of the sewer. Going back to his/her early years at grammar school, he/she recalled the dejection of being cut from his/her soccer team, and the glumness encountered upon resignedly realizing the inevitability of a return visit to the dreaded dentist. Additionally recalled was the dismal and cheerless memory of staying inside on a gloomy, rainy day, and his/her crestfallen stature upon receiving news of his/her sister's auto accident.

Bob/Beth arrived somewhat depressed for the second interview, and reported of his/her early teenage years. He/she recalled the despondency experienced in hearing rumors of the break-up of the Beatles, the despair of not obtaining tickets to a Rolling Stones concert, and the sadness in discovering a warp in a newly-purchased double album.

The thoughts continued at a quick and natural rate: the flunking of an important final exam; the grief in his/her best friend's voice when he/she informed Bob/Beth of his/her rejection by college admission committees; the remorsefulness after losing his/her

allowance; and the overwhelming sorrow in hearing his/her mother had developed cancer. Bob/Beth experienced himself/herself as a passive but involved observer to these fleeting incidents. However, as the story ended, he/she knew a shift inside of him/her had occurred. Because of the overwhelming misery in his/her story, Bob/Beth felt extremely sad as he/she concluded the interviews.

Neutral Mood Story

This is a brief summary of Bob/Beth Jones' life story recalled at age twenty during two interviews:

Bob/Beth initially recalled some memories at the age of four. He/she recalled a visit to a nearby city where he/she saw a large corporate skyscraper with bronze glass windows that mirrored the adjacent buildings, and a doorway in the front of the skyscraper with detailed carvings along the border. He/she also recalled the even length of the grey asphalt city blocks, the mannequins in department store windows, and the number of buses traveling on the street gathering passengers every few blocks.

Bob/Beth arrived for the second interview, and

reported of his early teenage years. He/she recalled the details of the house he/she lived in at that time, and gave descriptions of those surroundings. He/she recalled the green hedge lining the yard at one end, with flower beds in front that contained various flowers interspersed between herb and vegetable patches. Additionally recalled were the expanse of green lawn to the street, the aluminum mailbox at one corner of the yard where mail could be placed for collection, and the number of maple and elm trees on the property.

Appendix E
Stimulus Sentences

Happy Sentences

1. The company rewarded the staff with a big raise.
2. The campers spent a beautiful day on the riverbank.
3. The student received a letter from the family.
4. The senior achieved an excellent grade on the test.
5. The runner completed the race in first place.
6. The parents saw their first child in the nursery.
7. The committee welcomed the stranger with a reception.
8. The worker enjoyed the relaxation during vacation.
9. The applicant found a job with excellent benefits.
10. The team won a trophy for its performance.
11. The organization honored its retirees at the
banquet.
12. The employee bought a car with the bonus.

Sad Sentences

1. The gardener lost the ring in the field.
2. The trainer abused the animals in the circus.
3. The vandals shattered the windows with rocks.
4. The fire destroyed the stove in the kitchen.
5. The accident injured the pedestrians on the sidewalk.
6. The crowd trampled a spectator after the concert.

7. The robber injured bystanders in the market.
8. The individual ignored a friend with a problem.
9. The hiker broke a leg before the trip.
10. The foreigner felt homesick for family.
11. The addict stole money from a friend.
12. The surgeon mourned the loss of the patient.

Neutral Sentences

1. The renter occupied a room in the building.
2. The reader lit the lamp beside the table.
3. The athlete wore sneakers with laces.
4. The student checked the book from the library.
5. The caretaker watered the lawn for one hour.
6. The musician entered the bus with an instrument.
7. The clerk ate breakfast in the cafeteria.
8. The professor wrote the sentence on the board.
9. The tenant washed clothes in the basement.
10. The writer read the articles in the magazine.
11. The owner built an awning over the entrance.
12. The voters elect leaders in November.

Practice Sentences

1. The stove heated the soup in the pot.
2. The children opened the can of food.

Appendix F

Filler Task

Name _____

Starting at the top of the first column and moving down, carefully, but rapidly search for the number three (3). Everytime you see a three (3), circle it. Continue searching until Ken says "stop."

10480	15011	01536	02011	81647	91648	69179	14194	62590	36207	20969	99570	91291	90700
22368	46573	25595	85393	30995	89198	27982	53402	93965	34095	52666	19174	39615	99505
24130	48360	22527	97265	76393	64809	15179	24830	49340	32081	30680	19655	63348	58629
42167	93093	06243	61680	07856	16376	39440	53537	71341	57004	00849	74917	97758	16379
37570	39975	81837	16656	06121	91782	60468	81305	49684	60672	14110	06927	01263	54613
77921	06907	11008	42751	27756	53498	18602	70659	90655	15053	21916	81825	44394	42880
99562	72905	56420	69994	98872	31016	71194	18738	44013	48840	63213	21069	10634	12952
96301	91977	05463	07972	18876	20922	94595	56869	69014	60045	18425	84903	42508	32307
89579	14342	63661	10281	17453	18103	57740	84378	25331	12566	58678	44947	05585	56941
85475	36857	53342	53988	53060	59533	38867	62300	08158	17983	16439	11458	18593	64952
28918	69578	88231	33276	70997	79936	56665	05859	90106	31595	01547	85590	91610	78188
63553	40961	48235	03427	49626	69445	18663	72695	52180	20847	12243	90511	33703	90322
09429	93969	52636	92737	88974	33488	36320	17617	30015	08272	84115	27156	30613	74952
10365	61129	87529	85689	48237	52267	67689	93394	01511	26358	85104	20285	29975	89668
07119	97336	71048	08178	77233	13916	47564	81056	97735	85977	29372	74461	28551	90707
51085	12765	51821	51259	77452	16308	60756	92144	49442	53900	70960	63990	75601	40719
02368	21382	52404	60268	89368	19885	55322	44819	01188	65255	64835	44919	05944	55157
01011	54092	33362	94904	31273	04146	18594	29852	71585	85030	51132	01915	92747	64951
52162	53916	46369	58586	23216	14513	83149	98736	23495	64350	94738	17752	35156	35749
07056	97628	33787	09998	42698	06691	76988	13602	51851	46104	88916	19509	25625	58104
81525	72295	04839	96423	24878	82651	66566	14778	76797	14780	13300	87074	79666	85725
29676	20591	68086	26432	46901	20849	89768	81536	86645	12659	92259	57102	90428	25280
00742	57392	39064	66432	84673	40027	32832	61362	98947	96067	64700	64584	96096	98253
05366	04213	25669	26422	44407	44048	37937	63904	45766	66134	75470	66520	34693	90449
91921	26418	64117	94305	26766	25940	39972	22209	71500	64568	91402	42416	07844	69618
00582	04711	87917	77341	42206	35126	74087	99547	81817	42607	43808	76655	62028	76630
00725	69884	62797	56170	86324	88072	76222	36086	84637	93161	76038	65855	77919	89006
69011	65795	95876	55293	18988	27354	26575	08615	40801	59920	29841	80150	12777	48501
25976	67948	29888	88604	67917	48708	18912	82271	65424	69774	33611	54262	85963	03547
09763	83473	73577	12908	30883	18317	28290	35797	05998	41688	34952	37888	38917	89050
91567	42595	27958	30134	04024	86385	29880	99730	55536	84855	29080	09250	79656	73211
17955	56349	90999	49127	20044	59931	08115	20542	18059	02008	73708	83517	36103	42791
46503	18584	18845	49618	02304	51038	20655	58727	28168	15475	56942	53389	20562	87338
92157	89634	94824	78171	84610	82834	09922	25417	44137	84813	25555	21246	35509	20468
14577	62765	35605	81263	39667	47358	56873	56307	61607	49518	89656	20103	77490	18062
98427	07523	33362	64270	01638	92477	66969	98420	04680	45585	46565	04102	46880	45709
34914	63976	88720	82765	34476	17032	87589	40836	32427	70002	70663	88863	77775	69348
70060	28277	39475	46473	23219	53416	94970	25832	69975	94834	19661	72828	00102	66794
53976	54914	06990	67245	68350	82948	11398	42978	80287	88267	47363	46634	06541	97809
76072	29315	40980	07391	58745	25774	22987	60059	39911	96189	41151	14222	60697	59583
90725	52210	83974	29992	65831	38857	50490	83765	55657	14361	31720	57375	56228	41546
64364	67412	33339	31926	14883	24413	59744	92351	97473	89296	35931	04110	23726	51900
08962	00358	31662	25368	61642	34072	81249	35648	56891	69352	48373	45578	78547	81788
95012	68379	93526	70765	10592	04542	76463	54328	02349	17247	28865	14777	62730	92277
15664	10493	20492	38391	91132	21999	59516	81652	27195	48223	46751	22923	32261	85653

Appendix G

Mood Induction Instructions

Cook and Weaver Induction Procedure:

Hello, please put your jacket and books over here (pointing to the chair and table in front of oneway mirror) and be seated comfortably (pointing to chair in front of computer).

Before I tell you what I would like you to do, let me introduce the various pieces of equipment to you (pointing as you do). First is the computer keyboard. Note that some of the keys are covered. I will explain what this means later. Next is the computer screen on which some sentences will be displayed and I will also be telling you more about that in a little bit. Here we have the printer and beside it is the tape player that allows us to enter the program into the computer. This box allows us to use two headphones at the same time. Here are the two headphones --- one for you and one for me. This is a cassette tape player.

(Placing consent form in front of subject). Before we begin I would like you to read the following statements carefully. If you agree with them, then please sign your name here (pointing). Note that your ID number appears at the top of this form and will appear on all other forms in order to protect your confidentiality. (After subject signs) Now I would like you to read carefully and answer the biographical questions at the bottom of the form. (When subject is finished, remove the form).

Now let me tell you about the study. First, I will give you a pair of headphones and I will be using a pair too. They adjust to your head for comfort. You will then hear some music followed by a story and I would like you to listen carefully to both. While listening to both, I would like you to smile (or frown). I know it sounds unusual but it is important to the study. It is important that the smile (or frown) be natural and comfortable and not strained because I want you to maintain it as long as the music and story last. Now let me see you smile. Look at them with a smile (or frown) on your face to model what you want --- watch to make sure that the smile is not too big. The frown, on

the other hand, tends to be not too well pronounced. The corners of the mouth should be slightly pointing down and the lower lip stuck out a bit (like a pout). When the story is finished, you can put the headphones around your neck. Then I'd like you to pull out the keyboard to a position that is comfortable to you. Place the index fingers of both hands on the marked keys like so (demonstrate). (Note: control subjects see only one blank key so they will use the same index finger each time so tell them to put one index finger on the marked key). When you are ready to start the display of sentences, press the space bar. The sentences will be displayed one at a time for a set period of time. Do not worry the sentences will not be flashing at you; you will have plenty of time to read them. When the sentence appears on the screen, I would like you to read the sentence carefully. After reading the sentence carefully I would like you to: press the blank (for control subject), decide whether the sentence is happy or sad (for happy-sad). Once you have decided, then press: H for happy or S for sad. After all sentences are presented, there will be a story to be heard with the headphones. Are there any questions? (After answering all questions) Okay, here are the headphones. Put them on so they are comfortable for you. Remember to maintain you smile (or frown) throughout the music AND story. Let me see you smile (or frown) one more time. Ready? (start tape and monitor facial expression during music only --- reminding subjects to maintain smile or frown).

(After tape is finished, you put your headphones around you neck to model for subject). Before you pull out the computer keyboard, please read these 11 statements and then circle the one that corresponds to how you currently feel (watch that they circle just one). (Removing form) Now pull the keyboard out to a position that is comfortable to you. Then place your fingers on the marked keys and press the space bar when you are ready. (After subjects press space bar) Remember you are reading each sentence carefully and deciding if it is happy or sad.

(After sentences are completed) You can push the keyboard under the stand. (Putting random number table in front of subjects) I would now like you to start at the top of the first column of numbers and working down circle all the threes that you see. If you get to the

bottom before time is called then go to the next column. Begin when you are ready and I will tell you when to stop. (After one minute) Stop. (Remove number table) Now put on the headphones for a story that I would like you to listen carefully to. (After story, put mood scale in front of subject) Now I would like you to read these eleven statements carefully and circle the ONE that best describes how you feel right now.

(Removing scale and putting notebook paper in front of subject) Now what I would like you to do is write down as many of the sentences as you can remember that were displayed on the screen. You will have time to think. Even if you remember a fragment of a sentence or just a word, write that down. And if you remember something that you are not sure about, then write that down too. You may begin when you are ready and I will tell you when to stop. (For those who finish early, ask that they take another minute and remind that to write down what they remember even if they are not sure it was presented).

(After five minutes) Stop. (Removing recall and putting recognition task in front of subject) Now I would like you to read each of the following sentences carefully. If you think the sentence was displayed on the screen, then circle a "Y" for yes. If you do not think the sentence was displayed on the screen, then circle "N" for no. You may begin when you are ready.

(Removing recognition task). This concludes the study. Thank you very much for participating. How do you feel? I do have a favor to ask ---please do not tell anyone about the study for the next two weeks as they may also be subjects. The study is basically an attempt to determine if how you feel affects what you remember. I have no expectations as to what the results will be --- I am just exploring the issue and I do thank you for helping me out.

Velten Induction Procedure:

Hello, please put your jacket and books over here (pointing to the chair and table in front of oneway mirror) and be seated comfortably (pointing to chair in front of computer).

Before I tell you what I would like you to do, let me introduce the various pieces of equipment to you (pointing as you do). First is the computer keyboard. Note that some of the keys are covered. I will explain what this means later. Next is the computer screen on which some sentences will be displayed and I will also be telling you more about that in a little bit. Here we have the printer and beside it is the tape player.

(Placing consent form in front of subject). Before we begin I would like you to read the following statements carefully. If you agree with them, then please sign your name here (pointing). Note that your ID number appears at the top of this form and will appear on all other forms in order to protect your confidentiality. (After subject signs) Now I would like you to read carefully and answer the biographical questions at the bottom of the form. (When subject is finished, remove the form).

Now let me tell you about the study. I will present to you a stack of cards one at a time on which statements will be written. I would like you to read, think about, and read aloud each statement. It is important that you try and feel the mood suggested by the statements.

When you are finished reading the statements on the cards, I would like you to pull out the keyboard to a position that is comfortable to you. Place the index fingers of both hands on the marked keys like so (demonstrate). (Note: control subjects see only one blank key so they will use the same index finger each time so tell them to put one index finger on the marked key). When you are ready to start the display of sentences, press the space bar. The sentences will be displayed one at a time for a set period of time. Do not worry the sentences will not be flashing at you; you will have plenty of time to read them. When the sentence appears on the screen, I would like you to read the sentence carefully. After reading the sentence carefully I would like you to: press the blank (for

control subject), decide whether the sentence is happy or sad (for happy-sad). Once you have decided, press: H for happy or S for sad. After all sentences are presented, there will be 15 neutral statements to be read. Are there any questions? (After answering all questions) I would like you to read, think about, and read again aloud each statement.

Before you pull out the computer keyboard, please read these 11 statements and then circle the one that corresponds to how you currently feel (watch that they circle just one). (Removing form) Now pull the keyboard out to a position that is comfortable to you. Then place your fingers on the marked keys and press the space bar when you are ready. (After subjects press space bar) Remember you are reading each sentence carefully and deciding if it is happy or sad. (After sentences are completed) You can push the keyboard under the stand. (Putting random number table in front of subjects) I would now like you to start at the top of the first column of numbers and working down circle all the threes that you see. If you get to the bottom before time is called then go to the next column. Begin when you are ready and I will tell you when to stop.

(After one minute) Stop. (Remove number table) Now read these sentences. (After finish reading the sentences, put mood scale in front of subject) Now I would like you to read these eleven statements carefully and circle the ONE that best describes how you feel right now.

(Removing scale and putting notebook paper in front of subject) Now what I would like you to do is write down as many of the sentences as you can remember that were displayed on the screen. You will have time to think. Even if you remember a fragment of a sentence or just a word, write that down. And if you remember something that you are not sure about, then write that down too. You may begin when you are ready and I will tell you when to stop. (For those who finish early, ask that they take another minute and remind that to write down what they remember even if they are not sure it was presented).

(After five minutes) Stop. (Removing recall and putting recognition task in front of subject) Now I would like you to read each of the following sentences carefully. If you think the sentence was displayed on the screen,

then circle a "Y" for yes. If you do not think the sentence was displayed on the screen, then circle "N" for no. You may begin when you are ready.
(Removing recognition task). This concludes the study. Thank you very much for participating. How do you feel? I do have a favor to ask ---please do not tell anyone about the study for the next two weeks as they may also be subjects. The study is basically an attempt to determine if how you feel affects what you remember. I have no expectations as to what the results will be I am just exploring the issue and I do thank you for helping me out.

Appendix H
Recognition Task

ID _____

Read each sentence carefully and then decide whether the sentence was one you read on the computer screen. If you decide yes, circle the "Y". If you decide no, then circle the "N".

- Y N 1. The robber injured bystanders in the market.
- Y N 2. The carpenter held the hammer by its handle.
- Y N 3. The committee welcomed the stranger with a reception.
- Y N 4. The speaker provided an outline for the talk.
- Y N 5. The worker enjoyed the relaxation during vacation.
- Y N 6. The illness caused the paralysis of the hand.
- Y N 7. The fire destroyed the stove in the kitchen.
- Y N 8. The sharpener put a point on the pencil.
- Y N 9. The children mistreated their parents in the nursing home.
- Y N 10. The dancers liked the music of the band.
- Y N 11. The insects ruined the outing at the park.
- Y N 12. The family sheltered the stray animals in the barn.
- Y N 13. The club sponsored a party for its members.
- Y N 14. The voters elect leaders in November.
- Y N 15. The executives played racquetball in the gym.
- Y N 16. One roommate fought the other over the rent.
- Y N 17. The folks had a wonderful time at the picnic.
- Y N 18. The reader lit the lamp beside the table.

- Y N 19. The clown entertained the spectators at the carnival.
- Y N 20. The crowd trampled a spectator after the concert.
- Y N 21. The caretaker watered the lawn for one hour.
- Y N 22. The hiker broke a leg before the trip.
- Y N 23. The youth wrecked the car before the event.
- Y N 24. The vandals shattered the windows with rocks.
- Y N 25. The runner completed the race in first place.
- Y N 26. The divorce depressed the neighbors on the block.
- Y N 27. The owner built an awning over the entrance.
- Y N 28. The writer read the articles in the magazine.
- Y N 29. The family rented the house on the corner.
- Y N 30. The clerk ate breakfast in the cafeteria.
- Y N 31. The jury convicted the mayor of perjury.
- Y N 32. The graduates received praise for their honors.
- Y N 33. The people lost money during the default.
- Y N 34. The doctor diagnosed cancer in the lung.
- Y N 35. The campers spent a beautiful day on the riverbank.
- Y N 36. The addict stole money from a friend.
- Y N 37. The student received a letter from the family.
- Y N 38. The salesperson combed the hair with the brush.
- Y N 39. The accident injured the pedestrians on the sidewalk.
- Y N 40. The organization honored its retirees at the banquet.
- Y N 41. The employee bought a car with the bonus.
- Y N 42. The driver drove the car down the street.

- Y N 43. The lawyer donated money to the university.
- Y N 44. The professor complimented the class on its performance.
- Y N 45. The individual ignored a friend with a problem.
- Y N 46. The baker dropped the pie on the floor.
- Y N 47. The team won a trophy for its performance.
- Y N 48. The candidate failed the test for graduation.
- Y N 49. The applicants received prizes for their winning efforts.
- Y N 50. The athlete wore sneakers with white laces.
- Y N 51. The renter occupied a room in the building.
- Y N 52. The parents saw their first child in the nursery.
- Y N 53. The foreigner felt homesick for family.
- Y N 54. The trainer abused the animals in the circus.
- Y N 55. The tenant washed clothes in the basement.
- Y N 56. The shopper purchased the food at the store.
- Y N 57. The applicant found a job with excellent benefits.
- Y N 58. The individual visited the store in the mall.
- Y N 59. The narrator told the story to the group.
- Y N 60. The derelict gathered food from the garbage.
- Y N 61. The relatives spent the afternoon with the family.
- Y N 62. The surgeon mourned the loss of the patient.
- Y N 63. The student checked the book from the library.
- Y N 64. The exerciser lost weight during the workout.
- Y N 65. The company rewarded the staff with a big raise.
- Y N 66. The professor wrote the sentence on the board.

- Y N 67. The senior achieved an excellent grade on the test.
- Y N 68. The gardener lost the ring in the field.
- Y N 69. The person read the newspaper in the library.
- Y N 70. The newcomer made fiends at the meeting.
- Y N 71. The musician entered the bus with an instrument.
- Y N 72. The person boiled the rice for twenty minutes.