Journal of Mental Imagery, 1995, *19*(1&2) 133-150

Mood Inductions for Four Specific Moods: A Procedure Employing Guided Imagery Vignettes With Music

JOHN D. MAYER, JOSHUA P. ALLEN, and KEITH BEAUREGARD
University of New Hampshire

Despite widely acknowledged differences among happiness, anger, fear, and sadness, there exists no set of experimental procedures that are parallel in form for inducing such specific moods. Four specific mood inductions are developed using guided imagery to engage foreground attention and emotional music to set a background state. Vignettes and music are rated in Experiment 1, the inductions are tested in Experiment 2 and perform quite well, and the external validity of the inductions is demonstrated in Experiment 3.

Recent progress in mood research has depended in part on the advent of experimental procedures for inducing happiness and sadness (Bower, 1981; Chartier & Ranieri, 1989; Clark, 1983; Larsen & Sinnett, 1991; Pignatiello, Camp, & Rasar, 1986; Velten, 1968). Although happy and sad mood inductions exist, their influence may not be altogether specific to their intended moods. Mood inductions for sadness also often bring about related negative moods such as anger and fear (Polivy, 1981). Because negative moods also co-occur in nature (Watson & Clark, 1992), perhaps any experimentally valid recreation of a given negative mood should be expected to have accompanying it nontargeted negative moods. Still, this lack of mood specificity has discouraged attempts to develop inductions beyond those that already exist for happiness and sadness.

Nonetheless, specific mood inductions can be useful even if their effects influence other nontargeted moods to a modest degree. The logic of research interpretation often requires only relative rather than absolute dif-

Authors' address: Department of Psychology, Conant Hall, University of New Hampshire, Durham, New Hampshire 03824. Send reprint requests to first-named author.

This research was supported in part through a Biomedical Research Support Grant, University of New Hampshire (2 S07 RR07108-17), 1990-1991. We gratefully acknowledge the assistance of Kathy Rashed, who helped write many of the vignettes used in Experiment 1.

ferences in moods across groups. Relative differences in mood levels are frequently sufficient to conclude that the mood with the highest level is causing the effect, given appropriate controls. Moreover, specific mood inductions of some sort will be necessary to study individual moods, which are widely acknowledged to possess diverse characteristics (Ekman & Oster, 1979; Izard, 1977; Plutchik, 1984). To promote research in this area, the present paper describes a set of parallel procedures for the induction of four specific moods: happiness, anger, fear, and sadness.

Procedures for Inducing Moods

A variety of mood induction procedures exist, including the Velten procedure (Velten, 1968), music inductions (Clark, 1983; Pignatiello, Camp, & Rasar, 1986), and various other approaches (Bower, 1981; Polivy, 1981). The strongest mood inductions often combine two procedures to influence mood because it is believed that multiple inductions contribute additively to a mood (Bower, 1981; Clark, 1983). Such dual induction procedures may also enhance specificity because each of the two inductions can be individually targeted to the specific mood of interest.

Successful combinations of inductions typically employ a first induction that occupies foreground attention and a second one that contributes to background atmosphere. Foreground attention is often manipulated by guided imagery or a number of alternative techniques. The "guided imagery" label describes a procedure in which participants are asked to imagine themselves as vividly as possible in a series of described situations (e.g., "You are sitting in a restaurant with a friend and the conversation becomes hilariously funny and you can't stop from laughing"). (See Ahsen [1989], "Guided Imagery: The Quest for a Science," for a general discussion of guided imagery theory and practice).

This guided imagery designation distinguishes such a procedure from other popular methods in which guided imagery plays a secondary role or is absent, including: (a) *self-description procedures,* in which the participant reads a graded set of self-referential statements (e.g., "I am physically feeling very good today"; Velten, 1968), (b) *personal memory procedures* in which the participant retrieves his/her own personal emotional memories to enter a mood (Pignatiello, et al., 1986), (c) *hypnotic-memory procedures* in which the participant enters into a trance and re-experiences an earlier emotional memory (Bower, 1981), (d) *visual narrative procedures* in which the participant views a scene from a movie or video tape expected to induce a mood, and (e) *situational procedures,* in which the experimenter constructs a social situation (e.g., involving praise) to induce a mood.

Guided imagery, as described above, is one of the better alternatives for mood inductions. Self-description procedures yield fairly modest and short-lived mood effects (Albersnagel, 1988; Chartier & Ranieri, 1989; Larsen & Sinnett, 1991). Personal memories vary from individual to individual and, therefore, the experimenter abdicates any control of the specific information the individual is recalling. Hypnotic memory inductions leave open the problem of whether any obtained experimental effects are due to hypnosis, memory-within-hypnosis, or demand, rather than to the induced moods. Similarly, employing visual narrative procedures may lead to effects from the plot of the film rather than the induced mood. Because guided imagery techniques can be employed with seven or eight brief, diverse, vignettes, the influence of any one plot or motif is minimized.

To this first guided imagery mood induction procedure, that captures foreground attention, may be added an induction that influences the person's background state with mood-supportive music, hypnotic enhancements, or other alternatives (Bower, 1981; Clark, 1983). Although hypnosis was initially the preferred background procedure (Bower, 1981), it has been criticized for enhancing demands on subjects, employing subjects who differ from normals in being highly hypnotizable, and requiring specially trained experimenters (Mayer & Bower, 1985). The musical induction avoids these criticisms while also establishing a mood-supportive background state.

The combined guided imagery with music procedure has several advantages for creating inductions of specific moods. Although either guided imagery or music can be designed to target a specific mood, we predicted that using them together would enhance such specificity. Any given guided imagery vignette is only a framework to which the individual brings her or his own mental constructions. Because experimenter control is incomplete, the specificity of the mood cannot be guaranteed (Ahsen, 1989). Similarly, music inductions yield moods that are very nonspecific in the absence of guided imagery. Sutherland, Newman, & Rachman (1982), who studied music inductions without guided imagery, report "The sad mood induced by music was however accompanied by broad changes that included anxiety, tiredness, and apprehension as well as by sadness" (p. 130). Participants in music inductions tend to use a variety of strategies to alter their moods including images but also involving, "concentrating hard on the music, sighing. . .intensifying an already existent headache. . . " (Clark, 1983, p. 43). Therefore, a combined guided imagery with music procedure could lead to a more controlled, specific and effective induction (Clark, 1983; Mayer, Gayle, Meehan & Haarman, 1990; Pignatiello, et al., 1983).

Guided Imagery with Music Mood Induction

Previous use of the guided imagery with music mood induction has typically begun with subjects listening to a piece of music for one minute. As they continued listening, they next imagined themselves in situations described by guided imagery vignettes which were presented at 30- to 60-sec. intervals (the exact timing makes little difference; Mayer, et al., 1990).

Pre- and post-mood measures were made on a 21-point scale from sad (-10) to happy (10). Overall, we found that the initial mood, on average, was slightly positive (e.g., + 2), that the sad mood induction typically caused more mood change, and that final happy and sad moods appeared symmetrical around the zero-point of the 21-point scale.

The present experiments develop the above approach so that it can be used to induce any of four moods. To develop four specific mood inductions in Experiment 1, we obtained ratings of both guided imagery vignettes and musical pieces on their happy, angry, fearful, and sad mood content. Experiment 2 employed the top rated materials from Experiment 1 to induce the four specific moods, and Experiment 3 examined cognitive changes as a result of the mood induction procedure.

Experiment 1

Experiment 1 was designed to rate the emotional content of guided imagery vignettes and musical pieces, and to obtain specific emotion content ratings (happy/angry/fearful/sad) on 20 musical pieces, and 75 one- and two-sentence guided imagery vignettes. Four specific mood inductions were then developed on the basis of the results.

Method

Judges

Ten music judges (5 women and 5 men) and 10 vignette judges (5 women and 5 men) were employed. All 10 vignette judges and four of 10 music judges were drawn from the introductory psychology pool, but six of the musical judges were graduate students because the task required 2 hours of listening.

Materials

Musical selections. The 20 musical selections were nonvocal classical music pieces drawn from prior happy and sad music mood induction procedures (e.g., Bower & Mayer, 1989), supplemented by pieces from fear- and anger-orientated musical anthologies (see the Musical References section for a complete list).

Vignettes. The 75 vignettes (25 happy, 13 angry, 15 fearful, 22 sad) were

drawn from prior inductions (Bower & Mayer, 1989; Mayer, Gayle, Meehan, & Haarman, 1991) or written by the authors and laboratory members for this study.

Rating scale. Each guided imagery vignette and musical piece was rated on four 5-point scales (1[none] to 5 [a lot] according to four basic emotions). Each of the four basic emotion scales was anchored by a cluster of closely related terms: (a) Happy-Lively-Joyful, (b) Mad-Angry-Hostile-Furious, (c) Fearful-Nervous-Scared-Afraid, and (d) Sad-Blue-Depressed-Unhappy.[1]

Procedure

The music judges listened individually on personal stereo systems to the musical pieces, which had been arranged in a counterbalanced order. After hearing each piece, the judges completed the four emotion rating scales pertaining to it. The vignette judges worked similarly; after reading each vignette, the judge completed the four emotion rating scales pertaining to it. Pages of vignettes were counterbalanced.

Results and Discussion

Interjudge agreement on the happy, angry, fearful, and sad content of the musical selections was high (coefficient alpha $r(20) = .94$,. 85, . 86, and .97, respectively); as was the interjudge agreement on the guided imagery vignettes, (coefficient alpha $r(75) = .99, .96, .96$, and .96). A musical piece's or vignette's rated emotional value was calculated by averaging across raters. We then selected those musical pieces and vignettes that had relatively high ratings on the target mood and low ratings on the nontarget moods to create a given mood induction. The music and vignettes we selected for each induction, as well as their ratings on the four moods, can be seen in Table 1.

For the happy mood induction materials, both music and vignettes were rated near 5 on happiness and near 1 for the negative moods, on the 5-point scale employed. For each of the three negative moods, the vignettes were rated at about 4.5 for the target mood and 1.5 for other moods. Only the angry and fearful music was less specific, with the angriest music also producing equal amounts of fear in subjects, presumably because they imagined themselves the target of the anger. Any such nonspecific music

[1] A second music rating scale asked individuals to rate the content of the music (as opposed to how the music made them feel). These content ratings were so similar to the feeling ratings that they are not further reported or discussed.

was expected to be disambiguated when combined with the more specific vignettes. Overall, the rating and selection of mood induction stimuli was probably near optimal for these types of materials.

Table 1
Four Specific Mood Inductions (Happy, Angry, Fearful, Sad) on a 5-point Scale (1=None; 5= A Lot)

	H	*A*	*F*	*S*
Happy Mood Induction				
Music				
Delibes (1870). Mazurka from *Coppelia.*	**4.7**	1.4	1.2	1.1
(Alternate:) Bach (1721). *Brandenburg Concerto #2*	**4.1**	1.4	1.4	1.1
Vignettes				
1. You just got a new job, and it's even better than you expected.	**4.9**	1.0	1.6	1.0
2. You wake up on a Saturday after a number of wintry-cold rainy days, and the temperature is in the high sixties.	**4.8**	1.0	1.0	1.0
3. You buy a lottery ticket and you win $100.00 instantly.	**4.8**	1.0	1.0	1.0
4. You and a friend go to a nice restaurant. The meal, the conversation, and the atmosphere are all perfect.	**4.7**	1.0	1.3	1.0
5. You get out of class or work early. It's a beautiful day and you and some friends go for an ice cream.	**4.6**	1.0	1.1	1.1
6. You spend a day in the mountains; the air is clean and sharp, the day sunny, and you take a swim in a beautiful lake.	**4.9**	1.0	1.0	1.0
7. You unexpectedly run into someone you like. You go for coffee and have a great conversation. You discover you think alike, and share many of the same interests.	**4.9**	1.0	1.3	1.0
8. It's your birthday and friends throw you a terrific surprise party.	**4.9**	1.0	1.3	1.1
Vignette Mean	**4.8**	1.0	1.2	1.0
Angry Mood Induction	H	A	F	S
Music				
Moussorgsky (1867). *Night on Bald Mountain.*	2.0	**3.0**	3.1	1.4
(Alternate:) Hoist (1918). Mars, from *The Planets.*	1.4	**2.6**	3.0	1.0
Vignettes				
1. A student stole the exam in an important course you're taking.The professor takes it out on everyone by making such a tough exam that you get a very low grade even though you understood the material.	1.1	**4.3**	1.0	2.7
2. A friend of yours was sexually assaulted by a convicted rapist just released on parole.	1.0	**4.7**	2.8	2.6

Angry Mood Induction (continued)

	H	*A*	*F*	*S*
3. Your boss decides to promote another employee who is related to him to a position he knew you wanted. He tells you that you didn't work hard enough, even though he knows you worked much harder and better than his relative.	1.1	**4.5**	1.0	2.4
4. It's a very hot day, and you have been standing in a long, slow line at the Department of Motor Vehicles for over an hour. Kids are screaming all around you when two of the four clerks close their windows for no apparent reason.	1.0	**4.5**	1.3	2.3
5. Someone put a big scratch in your car while it was parked in the lot and didn't even bother to leave a note.	1.0	**4.8**	1.3	1.9
6. The landlord doesn't like you and has been accusing you of unsanitary conditions even though you keep your apartment very clean. You arrive home only to see an eviction notice on your door.	1.0	**4.6**	1.8	1.8
7. Somebody files a false legal claim against you.	1.0	**4.3**	2.7	2.0
8. A strange-seeming student in your class told the professor that you cheated on the last exam when you didn't. The professor tells you you'll have to take the exam over again because he can't be sure you didn't cheat.	1.0	**4.5**	1.9	1.9
Vignette Mean	1.0	**4.5**	1.7	2.2

Fear Mood Induction

	H	*A*	*F*	*S*
Music				
Ives (1906). *Halloween.*	1.5	2.5	**3.6**	1.3
(Alternate:) Herrmann (1960). *Psycho.*	1.1	1.6	**2.8**	2.6
Vignettes				
1. You are riding alone in an elevator when a man walks in and pulls out a knife. He stares at you without saying what he wants.	1.0	1.9	**4.9**	1.7
2. You're in an overcrowded carriage at the top of a ferris wheel when the mechanism malfunctions and the wheel jams. A thunder storm is developing, and the wheel sways in the wind, its metal creaking.	1.2	1.7	**4.0**	1.6
3. Your car breaks down on a back street in the dangerous part of the city. You start to go for help when you see several teenage boys walking toward you carrying weapons.	1.4	1.5	**4.7**	1.9
4. You are driving down an unfamiliar road on a stormy night when your car skids out of control.	1.0	1.5	**4.7**	1.4
5. You are driving down the road when a tractor trailer going in the opposite direction crosses over into your lane.	1.0	2.0	**4.6**	1.1
6. You're in your bedroom late at night when you hear someone enter your apartment. No one else you know has a key.	1.0	1.5	**4.5**	1.1
7. You're swimming in a dark lake and something big, slimy, and prickly brushes against your leg.	1.2	1.0	**4.7**	1.0
8. You're having a nightmare about someone chasing you and you fall into a bottomless pit. You start to scream in your sleep.	1.0	1.1	**4.6**	1.4
Vignette Mean	1.1	1.5	**4.6**	1.4

Sad Mood Induction

	H	*A*	*F*	*S*
Music				
Chopin (1839). Opus 28,/# 6, from *Preludes.*	1.2	1.4	1.3	**4.3**
(Alternate:) Prokofiev (1938). Russia... from *Alexander Nevsky.*	1.0	1.4	2.6	**3.7**
Vignettes				
1. You read in the newspaper that a teacher you used to house-sit for recently past away.	1.1	1.1	1.0	**4.1**
2. You are told by a young relative that she has cancer and only six months to live.	1.0	2.0	2.8	**4.5**
3. You have been dating someone and you thought it looked quite promising, when the person calls you up and tell you he/she doesn't want to see you any more.	1.1	2.7	1.3	**4.5**
4. A pet you were really fond of has died.	1.1	2.0	1.1	**4.6**
5. Your best friend just got married and is moving far away from you.	1.9	1.2	1.2	**4.3**
6. No one remembers your birthday.	1.0	2.7	1.0	**4.6**
7. A relative of yours, with whom you've shared a close relationship, has been diagnosed as having cancer and has only a short time to live.	1.0	1.9	2.6	**4.6**
8. A beloved pet dies of old age. You have very fond memories of your pet and are reminded of them every time you see a similar breed.	1.2	1.1	1.1	**4.2**
Vignette Mean	1.2	1.8	1.5	**4.4**

Experiment 2

In Experiment 2, we tested the performance of the mood inductions assembled in Experiment 1. Each participant underwent the four mood inductions in a counterbalanced order. We predicted that distinct happy, angry, fearful, and sad moods would be induced.

Method

Subjects

Thirty-six students drawn from a standard Introductory Psychology subject pool received course credit for their participation.

Design

A within-subjects design was employed in which each participant first recorded his or her incoming mood, and then underwent a counterbalanced sequence of the four mood inductions, recording his or her mood after each.

Mood Scales

A 16-item mood adjective scale measured four individual moods: (a) happiness: *cheerful, happy, lively, joyful;* (b) anger: *angry, furious, mad, hostile;* (c) fear: *scared, fearful, afraid, and nervous;* and (d) sadness: *blue, depressed, unhappy,* and *sad.* Adjectives were selected on the basis of factor analyses (Mayer, Stevens, Bryan, & Nishikawa, 1992; Watson & Clark, 1992), and each adjective was responded to on a 4-point Likert scale anchored by (1) Definitely do not feel and (4) Definitely feel. A scale was scored by summing its four adjectives and subtracting four points from the total. This yielded a 0-12 point range for each scale with a roughly meaningful zero-point indicating that a person definitely did not feel any of the moods inquired about on the particular scale.

Mood Inductions

Subjects were first asked to enter a specific mood. If agreeable (all were), they donned headphones and began listening to the music selected for the specific mood being induced (see Table 1). After one minute, subjects were signalled by a light to read the first vignette of the specific induction (Table 1). They were signalled at subsequent 30 sec. intervals to proceed to the next vignette until all eight vignettes for the given induction had been read.

Procedure

Subjects, tested in small groups, were given consent forms to fill out, and recorded their incoming mood. Subjects then underwent the four counterbalanced mood inductions. Between each induction participants were told to allow their mood to return to neutral. After the session they were debriefed concerning the experiment. Subjects administered final negative moods were allowed the opportunity to undergo a final happy mood induction to improve their mood.

Results and Discussion

Moods were measured five times: once at baseline, and once after each of the four mood inductions. Each of the four specific scales measuring happy, angry, fearful, and sad mood had good reliabilities (coefficient alpha r's between .75-.90). As is typically found, the baseline levels indicated that happiness was far higher than the lower levels of anger, fear, and sadness which were near equal among themselves ($M(36) = 7.9$ versus 1.6, 1.7, and 2.2, respectively; Hotelling's $F(3,33) = 45.1$, $p < .001$). Because of the potential non-equivalence of positive (e.g., happiness) and negative (e.g.,

anger, fear, sadness) mood reports due to higher levels of happiness, we first analyzed the happiness induction both by itself and in relation to the negative moods as a group. After providing evidence for the specificity of the happy mood induction, we then examined the negative moods as a group and the evidence for their individual specificities.

We first compared the happy induction to the baseline, in a Rated Mood (happy/angry/fearful/sad) x Time (pre/post happy mood induction) repeated measures MANOVA (all subsequent *F*'s are Hotelling's). Not surprisingly, happiness was overall more prevalent than the other emotions across the baseline and happy induction ($F(3,33) = 83.5$; $p < .001$). Table 2 shows that the happy induction improved the already high initial levels of happiness from $M(36) = 7.9$ (top line of Table 2, on left) to a higher level of $M(36) = 9.1$ (Table 2, on left), and even more dramatically reduced the initial negative moods of the participants to near zero ($M(36) = 0.6, 0.9, \& 1.2$). Because there were one positive and three negative moods measured, overall mood levels were, therefore, reduced (Hotelling's $F(1,35) = 5.87$; $p < .025$). The differential influence of the happy mood induction on happy mood was reflected by a significant Rated Mood x Time interaction ($F(3,33) = 8.96$; $p < .001$).

Turning next to the negative mood inductions, these raised average negative moods from a baseline $M(36) = 1.8$, to an average post-negative-induction level of ($M(36) = 3.1$, $t(35) = 4.2$, $p < .001$), and decisively suppressed the average happy mood from its baseline of $M(36) = 7.9$ down to $M(36) = 3.8$ on average ($t(35) = 8.3$, $p < .001$). To further analyze our data, we employed a repeated measures Induction (angry/fear/sad) x Targeted Mood (targeted/average nontargeted negative mood) MANOVA. For example, for the anger mood induction, anger ratings were targeted, and the fear and sadness ratings were nontargeted (and averaged together).[2]

The purpose of each induction was to raise its target mood specifically, despite the natural covariance of negative moods. Table 2 shows that the negative inductions led to only marginal rises in nontargeted moods, with the average rise for a nontargeted negative mood between ($M(36) = 0.4$ to 1.8). In contrast, targeted moods rose strongly from baseline for each specific negative induction (M's$(36) = 3.9$ to 5.7) and to a significantly higher

[2] This analysis is used below to indicate the specificity of each negative induction; it is unclear whether a multivariate, within-subject contrast for the unpleasant moods appropriate to the present data is available.

degree than nontargeted moods ($F(1,35) = 158.1$, $p < .001$). Follow-up tests indicated that each negative induction was individually significant in raising its specifically targeted emotion at a level above the nontargeted emotions (Anger: $F(1,35) = 33.0$; Fear: $F(1,35) = 19.5$; Sad: $F(1,35) = 67.6$; all $p < .0001$). Finally, a Target x Induction interaction indicated that some inductions, notably sadness, were somewhat more effective at elevating their target mood than others ($F(2,34) = 6.0$, $p < .01$).

A further examination of Table 2 indicates that each induction raised its targeted emotion to the highest level, both within and across inductions, but that the greatest specificity among moods occurred in comparisons across inductions. That is, happiness levels following the happiness induction were 4.9 to 6.1 points higher than following comparison inductions. The equivalent comparisons for the other mood inductions and their targeted moods were, for anger, from 2.7 to 5.1 points higher than following the comparison inductions, for fear, from 3.0 to 4.7 points higher, and for sadness from 3.9 to 6.7 points higher. Each mood differed significantly across the four mood inductions at beyond the $p < .001$ level (Happy $F(3,33) = 31.9$; Angry $F = 25.4$, Fearful $F = 25.6$, and Sad $F = 50.3$). This roughly 3-point advantage of the targeted negative mood represents about 33% to 75% of the measured range of a given negative mood. Moreover, additional specificity can be obtained by dropping subjects who fail to meet a preset minimum criterion for mood change. In summary, the set of inductions create four specific mood groups in which the target mood is optimized.

Table 2
Effects of the Mood Inductions on Participants' Mood Reports

	Mood Reports							
Exprimental	Reported Mood Levels				Conditionalized on Baseline			
Condition	*Happiness*	*Anger*	*Fear*	*Sadness*	*Happiness*	*Anger*	*Fear*	*Sadness*
Initial Mood Level	7.9	1.6	1.7	2.2	-	-	-	-
Mood Inductions								
Happy	*9.1*	0.6	0.9	1.2	*1.3*	-1.0	-0.8	-1.0
Angry	4.3	*5.7*	2.0	3.8	-3.6	*4.1*	0.4	1.6
Fear	3.9	3.0	*5.5*	4.0	-3.9	1.4	*3.9*	1.8
Sad	3.1	2.8	2.7	*7.9*	-4.8	1.2	0.9	*5.7*

Experiment 3

Experiments 1 and 2 presented a group of mood inductions for four specific moods (happy, angry, fearful and sad). Other musical imagery mood-inductions for happy and sad moods have been widely employed, with the preponderance of evidence suggesting that these experimental procedures generate moods that have effects similar to those of natural moods (Bower, 1981; Mayer, Gaschke, Braverman, & Evans, 1992), and with only limited evidence to-date to the contrary (Parrott & Sabini, 1990).

Even though such inductions are widely regarded as a useful experimental procedure (e.g., Larsen & Sinnett, 1991), some researchers have argued that these effects might occur in part for reasons of cognitive priming (Blaney, 1986) or demand (Buchwald, Strack, & Coyne, 1981; Polivy & Doyle, 1980). Considerable debate has been devoted to this problem with no resolution thus far.

Along these lines, Experiment 3 addressed the issue of external validity of the present inductions; that is, happy and sad mood inductions were tested to see whether they produced effects obtained by happy and sad natural moods, as well as by alternative happy and sad mood inductions. Anger and fear inductions were not used because the specific effects they should produce are unknown at present. Specifically, Experiment 3 tested the hypothesis that happy and sad mood inductions produce the same mood-congruent judgment effect which has been found with both happy and sad experimentally-induced and naturally-occurring moods (see Fiske & Taylor, 1991, for a review). The mood-congruent judgment effect occurs when, for example, mood congruent events are judged more likely than non-congruent events. That is, a happy person will think good weather will be more likely for a picnic than will a sad person. We hypothesized that happy mood inductions would lead to more positive judgments; sad mood inductions to more negative judgments.

Method

Participants

Thirty-seven undergraduates, blind to the research hypothesis, participated in the experiment as a laboratory experience within their course on research methods.

Mood Inductions

The happy and sad mood inductions previously described in this paper were employed.

Scales

The dependent measures included a scale of pleasant-unpleasant mood (Brief Mood Introspection Scale; Mayer & Gaschke, 1988) and two roughly parallel scales of pleasant-unpleasant judgment, here referred to as A and B. The two judgment scales comprised 12 items each, drawn from Mayer and Hanson (1995). A sample item read: "What is the probability of a married couple getting a divorce within five years of their marriage?" followed by seven alternatives (0-10% 11-20% 21-40% 41-60% 61-80% 81-90% 91-100%). Both 12-item scales yield an overall score for the pleasant-unpleasant quality of judgment which was expected to become more pleasant in happier moods.

Overall Procedure

Subjects were randomly assigned to receive either a happy or a sad mood induction. After receiving the mood induction, they then completed (a) judgment scale A or B (assigned randomly), (b) the mood scale, and (c) the alternative form of the pleasant-unpleasant judgment scale. To insure that all the participants finished in a mood no worse than when they started, sad mood induction participants received a final happy mood induction.

Results and Discussion

Findings revealed a significant effect of mood induction on mood (M(happy) = 9.3 versus M(sad) = 2.4; t = 3.26, $p < .003$; on the BMIS). A 2 (happy/sad mood condition) x 2 (Form A/Form B pleasant-unpleasant judgment scale) repeated measures ANOVA indicated that, as predicted, happy subjects made more positive judgments than sad subjects (M(happy) = 14.9, M(sad) = 10.2; $F(1,36) = 7.25$, $p < .025$). A second main effect indicated that the two judgment scales had different means because of their varying item content (M(Form A) = 10.4, M(Form B) = 14.7; $F(1,36) = 20.39$, $p < .001$). There was no interaction between mood condition and the judgment scales ($F(1,36) = .09$, n.s.). Thus, these mood induction procedures cause the same effects on judgment as do other moods, be they experimentally induced or natural.

Discussion

This paper described a set of specific happy, angry, fear, and sad mood inductions which were developed using two types of material: guided

imagery vignettes with specific emotional content to engage foreground attention, and emotional music to enhance the background. As a result of Experiment 1, near optimal stimulus materials were selected for such inductions; Experiment 2 combined and administered these to participants. Overall, we found that participants began with stronger happy than unhappy moods; that the happy mood induction further raised happiness and suppressed the negative moods; and that the negative mood inductions suppressed happiness and raised levels of the targeted negative mood. Further, each negative mood induction hardly influenced its nontargeted mood at all, whereas it raised its specifically targeted mood substantially so that each mood induction raised its targeted mood to the highest level within a given induction despite the differing initial baselines and natural covariance among negative moods. We also found that anger following the anger induction was highest relative to anger levels following the happy, fear, and sad inductions, and that, similarly, happiness was highest in the happy induction relative to following the anger, fear, and sad inductions; the same held true for fear and sadness. Thus, using the four inductions together can lead to convincing relative comparisons across mood groups. (Further specificity can be obtained by requiring subjects to meet a minimum criterion of mood change.) Finally, in Experiment 3, we found that the happy and sad mood inductions exhibited external validity by causing a mood congruent judgment effect commonly obtained with other laboratory mood inductions and with natural mood (Fiske & Taylor, 1991).

As noted above, most evidence indicates that mood induction procedures do, in fact, produce a valid version of a naturally occurring mood. Most, although not all, findings with experimental mood also occur with natural mood. There have also been justifiable concerns over whether such inductions are due partially to cognitive priming or even experimenter demand effects (Buchwald, Strack, & Coyne, 1981; Polivy & Doyle, 1980). The distinctions among real mood change, cognitive priming, and experimenter demand are ongoing problems shared by virtually all mood induction procedures in use today. Because people are presumably aware of some influences of their mood, the sorting out of mood, priming, and demand issues is a project in process that will need to be further addressed with all experimental mood induction techniques. Even so, some case can be made that demand is insufficiently complex to explain the findings obtained with mood induction procedures such as the present ones. For example, the asymmetrical induction strengths found here and elsewhere for positive and negative moods are unlikely to be a part of a naive subject's implicit theory of mood (cf. Mayer & Bower, 1985; Mayer, Stevens, Bryan & Nishikawa, 1992). Given the above, experimental mood inductions

appear to be a valuable technique that is perhaps optimally used as a converging operation with the study of natural and clinical moods.

Almost since the onset of contemporary experimental mood research, mood theorists have been suggesting that each individual emotion or mood has its own meaning, and may, therefore, influence thoughts and behavior in its own unique way (Ekman & Oster, 1974; Izard, 1977; Plutchik, 1984). Although this is a plausible position, little experimental mood research has addressed the issue in part because there have been no available specific mood inductions with which to do so. Our studies offer such specific inductions by employing brief guided imagery vignettes with specific emotional content to capture foreground attention, and supportive background music with parallel emotional content for each of four emotions (happiness, anger, fear, and sadness), thus providing a useful addition to the mood induction armamentarium.

REFERENCES

Ahsen, A. (1989). Guided imagery: The quest for a science. Part I: Imagery origins. *Education, 110,* 2-16.

Albersnagel, F.A. (1988). Velten and musical mood induction procedures: A comparison with accessibility of thought associations. *Behaviour Research and Therapy, 26,* 79-96.

Blaney, P.H. (1986). Affect and memory: A review. *Psychological Bulletin, 99,* 229-246.

Bower, G. (1981). Mood and memory. *American Psychologist, 36,* 129-148.

Bower, G.H., & Mayer, J.D. (1989). In search of mood-dependent retrieval. *Journal of Social Behavior and Personality, 4,* 121-156.

Buchwald, A.M., Strack, S., & Coyne, J.C. (1981). Demand characteristics and the Velten Mood Induction Procedure. *Journal of Consulting and Clinical, 49,*478-479.

Chartier, G.M., & Ranieri, D.J. (1989). Comparison of two mood induction procedures. *Therapy and Research, 13,* 275-282.

Clark, D.M. (1983). On the induction of depressed mood in the laboratory: Evaluation and comparison of Velten and musical procedures. *Advances in Behavior Research and Therapy, 5,* 27-49.

Ekman, P., & Oster, H. (1979). Facial expressions of emotion. *Annual review of Psychology, 32,* 527-554.

Fiske, S. & Taylor, S. (1991). *Social cognition* (2nd edition). New York: McGraw Hill.

Izard, L.E. (1977). *Human emotions.* New York: Plenum Press.

Larsen, R.J., & Sinnett, L.M. (1991). Meta-Analysis of experimental manipulations: some factors affecting the Velten Mood Induction Procedure. *Personality and Social Psychology Bulletin, 17,* 323-334.

Mayer, J.D., & Bower, G.H. (1985). Naturally occurring mood and learning: Comment on Hasher, Rose, Zacks, Sanft, and Doren. *Journal of Experimental Psychology: General, 114,* 396-403.

Mayer, J.D., Gayle, M., Meehan, M.E. & Haarman, A.K. (1990). Toward better specification of the mood-congruency effect in recall. *Journal of Experimental Social Psychology, 26,* 465-480.

Mayer, J.D., Gaschke, Y.N., Braverman, D.L., & Evans, T.W. (1992). Mood-congruent judgment is a general effect. *Journal of Personality and Social Psychology, 63,* 119-132.

Mayer, J.D., & Hanson, E. (1995). Mood-congruent judgment over time. *Personality and Social Psychology Bulletin, 21,* 237-244.

Mayer, J.D., Stevens, A., Bryan, J., & Nishikawa, M. (1992). *The experience of emotion.* Unpublished manuscript.

Parrott, W.G., & Sabini, J. (1990). Mood and memory under natural conditions: Evidence for mood incongruent recall. *Journal of Personality and Social Psychology, 59,* 321-336

Pignatiello, M.F., Camp, C.J., & Rasar, L.A. (1986). Musical Mood Induction: An alternative to the Velten Technique. *Journal of Abnormal Psychology, 95*, 295-297.

Plutchik, R. (1980). *Emotion: A psychoevolutionary synthesis.* New York: Harper & Row.

Polivy, J., & Doyle, C. (1980). Laboratory induction of mood states through the reading of self-referent mood statements: Affective changes or demand characteristics? *Journal of Abnormal Psychology, 89*, 286-290.

Polivy, J. (1981). On the induction of emotion in the laboratory: Discrete moods or multiple affect states? *Journal of Personality and Social Psychology, 41*, 803-817.

Sutherland, G., Newman, B., & Rachman, S. (1982). Experimental investigations of the relations between mood and intrusive, unwanted cognitions. *British Journal of Medical Psychology, 55*, 127-138.

Velten, E. (1968). A laboratory task for induction of mood states. *Behavior Research and Therapy, 6*, 473-482.

Watson, D., & Clark, L.A. (1992). Affects separable and inseparable: On the hierarchical arrangement of the negative affects. *Journal of Personality and Social Psychology, 62*, 489-505.

Musical References

Bach, J.S. (1721/1977). *Brandenberg Concerto No.2, BWV 1047 (First Movement; Allegro* (Time: 5:08). J. Levine (Cond.) Chicago Symphony Orchestra. In *Music From Ravinia* series. New York: RCA Victor Gold Seal.[60378-2-RG].

Beethoven, L.V. (1804/1984). *Symphony No. 3 in Eb "Eroica" (Scherzo: Allegro vivace)* (Time: 5: 12). L. Von Dohnanyi (Cond.) The Cleveland Orchestra, Cleveland, OH: TELARC [CD-80090].

Beethoven, L.V. (1813/1982). *Wellington's victory, Opus 91* (Time 15:20).[Selections 3:03 to 9:45, deleting the initial 'Marlborough s'en va-t-en guerre' and 'Brittania rule the waves' melodies and the final 'God Save the King' melody.] E. Kunzel (Cond.) Cincinnati Symphony Orchestra. Cleveland, OH:TELARC.[CD-80079].

Berlioz, H. (1854/1988). *The damnation of Faust (Pandemonium; Scene 19)* (Time: 3:22). E. Kunzel (Cond.) Cincinnati Pops Orchestra. Released in Chiller. Cleveland, OH: TELARC. [CD-80189].

Chopin, F. (1839/1989). *Preludes, Opus 28 (2. A Minor)* (Time: 1:53). A. Rubinstein (Pianist). New York: RCA Victor Gold Seal [60047-2-RG].

Chopin, F. (1839/1989). *Preludes, Opus 28 (6. B minor)* (Time: 1:48). A. Rubinstein (Pianist). New York: RCA Victor Gold Seal [60047-2-RG].

Copland,A.(1944/1981). *Appalachian spring suite (Fourth movement: Fast)* (Time: 3:35). L. Bernstein (Cond.)New York Philharmonic. New York: CBS [MYK 37257].

Delibes, L. (1870/1969). *Coppelia (Mazurka, Act I, No. 3)* (Time: 4:27). R. Bonynge (Cond.) Orchestre de la Suisse Romande. New York: London:Records/Polygram [425 472-2].

Delibes, L. (1870/1969) *Coppelia (Theme slave varie)* (Time:6:47).R. Bonynge (Cond.). Orchestre de la Suisse Romande. New York: London Records/Polygram. [425 472-2]

Herrmann, B. (1942/1988). *Sleigh ride [from the film soundtrack of the Devil and Daniel Webster]* (Time: 1:51). E. Kunzel (Cond.) Cincinnati Pops Orchestra.Released in *Chiller.* Cleveland, OH: TELARC [CD-80189].

Herrmann, B. (1960/1988). *Three selections from [the film soundtrack] Psycho (Prelude and The Mad House)* (Times: 1:31; 1:59, resp.). E. Kunzel (Cond.) Cincinnati Pops Orchestra. Released in Chiller. Cleveland, OH: TELARC [CD-80189].

Holst, G. (1918/1986). *The planets: (Mars, the bringer of war)* (Time: 6:43). A. Davis (Cond.) The Toronto Symphony. Ontario, Canada: EMI Digital.[CDC 547417].

Holst, G. (1918/1986). *The planets (Saturn, the bringer of old age)* (Time: 8:34).Davis (Cond.). The Toronto Symphony. Ontario, Canada: EMI Digital [CDC547417].

Ives, C. (1906/1989). *Halloween* (Time: 1:57). E. Ormandy (Cond.) The Philadelphia Orchestra. Rereleased in *Fright night: Music that goes bump in the night.* New York: CBS [MDK 455 30].

Liszt, F. (1875/1982). *Hungarian Battle March* (Time:4:39). In E.Kunzel (Cond.) Beethoven/Liszt Battle Music, Cincinnati Symphony Orchestra. Cleveland, OH: TELARC [CD-80079]

Moussorgsky, M. (1867/1988). *Night on Bald Mountain (first 8:32(to bell chime) of 10:38)* (Time: 8:32). E. Kunzel (Cond.) Cincinnati Pops Orchestra. Released in *Chiller.* Cleveland, OH: TELARC [CD-80189].

Prokofiev, S. (1938/1987). *Alexander Nevsky Cantata Opus 78 (I. Russia Beneath the Yoke of the Mongols)* (Time: 3:42). A. Previn (Cond.). Los Angeles Philharmonic Orchestra. Cleveland, OH: TELARC [CD-80143].

Rimsky-Korsakov, N. (1888/1986). (Time: 10:39). H. Von Karajan (Cond.) Berliner Philharmoniker. Hamburg, W. Germany: Deutsche Grammophon. [419 063-2].

Wagner, R. (1874/1989). *Die Walkure (Ride of the Valkyries)* (Time: 5:01). E. Ormandy (Cond.) Philadelphia Orchestra. Rereleased in *Fright Night: Music that goes bump in the night.* New York: CBS [MDK 45530].

Waxman, F. (1935/1988). *The Bride of Frankenstein (Part 1)* (Time:5:08). E. Kunzel (Cond.) Cincinnati Pops Orchestra. Released in *Chiller.* Cleveland, OH: TELARC [CD-80189].