

Self-Regulation of Mood: Strategies for Changing a Bad Mood, Raising Energy, and Reducing Tension

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Four studies evaluated the success of behaviors and strategies used to self-regulate bad moods, raise energy, and reduce tension. Study 1 ($N = 102$) used an open-ended questionnaire to identify behavioral categories. Studies 2 and 4 surveyed a representative sample ($N = 308$) with a fixed-response questionnaire to quantify behaviors, general strategies, and individual differences. Study 3 used psychotherapist ($N = 26$) judgments of the likely success of the strategies. Therapist and self-rating converged on success of strategies and gender differences. These studies clarify and confirm previous research findings, particularly gender differences in controlling depression. Exercise appears to be the most effective mood-regulating behavior, and the best general strategy to change a bad mood is a combination of relaxation, stress management, cognitive, and exercise techniques. Results support a 2-dimensional biopsychological model of mood.

Behavioral scientists have been interested for some time in the tendency of people to monitor their mood states and to act in such a way as to self-regulate these moods to comfortable levels (e.g., Carver & Scheier, 1981; Cialdini, Darby, & Vincent, 1973; Clark & Isen, 1982; Morris & Reilly, 1987; Thayer, 1989). Analyses of the self-regulation of mood in particular seem to be gaining increasing momentum within the past couple of years. This is perhaps because mood is now recognized as a central element of human behavior, and mood management is basic to many of our common daily activities. The widespread interest is evident, for example, in a recently edited book by Wegner and Pennebaker (1993) that includes descriptions of research from at least a dozen laboratories dealing with different aspects of mood regulation (also see Larsen, 1993; Tice, 1993).

That people do in fact self-regulate mood is clear from research by Mayer, Salovey, and their associates (e.g., Mayer & Gaschke, 1988; Mayer, Salovey, Gombert-Kaufman, & Blainey, 1991) detailing the meta-experience of mood and various management strategies. This work demonstrates that in addition to sensing their mood levels, people also make judgments about that mood as they monitor the significance of it, evaluate the mood, and make certain rudimentary change decisions. The management of the mood experience as it is occurring apparently is an integral psychological process. A promising new and somewhat related advancement in the field is the development of various measures and general conceptualizations concerning individual differences in mood regulation (e.g., Catanzaro &

Mearns, 1990; Salovey, Hsee, & Mayer, 1993; Swinkels & Giuliano, in press).

Comprehensive Surveys of Behaviors That Regulate Mood

Directly applicable to the present research are studies in which people were surveyed concerning all the ways that they try to change their moods. Rippere (1977) asked a sample of people in London, "What's the thing to do when you are feeling depressed?" She found that the most frequently mentioned categories (with examples of consensual items in parentheses) were, social (see people), cognitive (think of reason for it), exercise (go for a walk), direct action (rectify the situation), distraction (keep busy), and listen to music. In an attempt to study coping behaviors for avoiding depression, Parker and Brown (1982) gave questionnaires to two sets of Australian patients in general medical practice ($n_s = 176$ and 103). The list of behaviors was compiled from literature and interviews. Again on the basis of our category names, the order of frequency was cognitive, distraction, direct action, and music. The social category was mentioned ninth in this listing.

In a Gallup poll conducted on 1,007 Americans and commissioned by the Christian Broadcasting Network, a number of categories of behavior for relieving depression were obtained (Gallup & Castelli, 1989). These included a general category that grouped alone, distraction, and music (77%); social (68%); eat (64%); religious practice (48%); exercise (40%); and shopping (31%). In an attempt to avoid biases associated with self-report, Morris and Reilly (1987) surveyed the literature and identified bodies of empirical studies related to the following kinds of mood regulation (their names are given here with examples they used for each category in parentheses): self-reward (e.g., pleasant activities); alcohol and tension reduction; expressive behavior (e.g., facial and postural change); cognitive restructuring; problem directed (e.g., increased effort and persistence); and affiliation.

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In the studies described above, some attempt was made to evaluate the success of the various behaviors identified to self-regulate mood. For example, in rank order, Rippere (1977) found that the most effective behaviors were associated with categories that we have named *social*, *cognitive*, *exercise*, and *direct action*. *Music*, *sleep*, and *enjoyable activities* were also judged effective. Parker and Brown's (1982) Ss judged the most effective techniques to be cognitive, social, distraction, religious activities, and direct action (music was also judged moderately effective, and exercise was not rated). The Gallup poll identified religious practices as most effective, followed by exercise, social, and distraction categories. Although no specific quantitative indexes of success were offered in Morris and Reilly's (1987) survey of the research literature, our reading of their article suggests that they judged cognitive techniques and distraction to be the most supported. On the other hand, self-reward and affiliation apparently were judged as including mixed evidence.

Certain common behaviors are apparent from these studies of people around the world. For example, social and cognitive behaviors were among the most frequently used to change negative moods. Moreover, these behaviors generally were judged as among the most effective. Distracting activities (hobby, read, and work) also were commonly reported to modify mood, and generally these were judged as moderately effective. Exercise, as well as music, food, and religious practices were present in most analyses, particularly those generated by Ss. Exercise, when included, was judged as among the more effective techniques. Religious practices were assessed in the Gallup poll to be most effective, but other studies either did not include these behaviors or judged them to be less effective. Considering the research as a whole, it is not clear what the relative frequency of these various mood-change behaviors is. Perhaps more important, it is not clear how they should be grouped and thus conceptualized. The need for further research along these lines is apparent.

Gender Differences in Mood Regulation

There has been a moderate amount of research to identify various individual differences in the use of mood-regulating behaviors. In relation to the studies to be presented below, perhaps the most important individual-difference variable is gender. The most significant findings concerning mood come from a wide variety of studies which suggest that women are twice as likely as men to be depressed (e.g., McGrath, Keita, Strickland, & Russo, 1990; Nolen-Hoeksema, 1987). As a means of accounting for these gender differences, Nolen-Hoeksema and her colleagues (see Nolen-Hoeksema, 1991, for a recent review) have done a series of empirical and theoretical analyses in which a response theory of depression was postulated. According to this theory, women are more likely to use rumination, and men distraction, in dealing with depression. Presumably, these two strategies are differentially effective. Therefore, when women use the rumination strategy and repeatedly focus on their negative condition, it is assumed that they are predisposed to continuing the depression. Distraction, on the other hand, is viewed as relatively more effective in dealing with depression. The evidence that there are such sex differences in these two strategies is promising but not extensive and conclusive at the present time.

Research by Nolen-Hoeksema, Morrow, & Fredrickson (1993) is most clear-cut regarding women's tendency to use rumination, but in that research, distraction was not confirmed as a male strategy. The present research may offer some clarification of the evidence concerning these gender differences, as well as clarification of how effective and ineffective strategies are defined.

Social support is probably an important mood regulator, and gender differences in the seeking of social interaction has been the subject of a number of studies. These studies seem to indicate that women are more likely to seek social interaction when depressed or under stress (Amirkhan, 1990; Flaherty & Richman, 1989; Funabiki, Bologna, Pepping, & FitzGerald, 1980; Houtman, 1990). Food as a mood regulator apparently also is used differently by men and women. Both experimental and questionnaire studies suggest that women are more likely than men to use food in response to stress and to depression (Forster & Jeffery, 1986; Funabiki et al., 1980; Grunberg & Straub, 1992). Moreover, these findings are consistent with the literature that shows a greater tendency of women than men to be diagnosed with eating disorders (e.g., Hsu, 1989).

On the other hand, men are more likely than women to use alcohol and drugs (Berkowitz & Perkins, 1987; Dube, Kumar, Kumar, & Gupta, 1978; Engs & Hanson, 1990; Richman & Flaherty, 1986), and at least some of this use may occur in response to depression (Berger & Adesso, 1991; Nolen-Hoeksema, 1987). In any event, these substances are often viewed as mood regulators (Morris & Reilly, 1987; Thayer, 1989). The present research was designed to offer some additional evidence with regard to each of these individual-difference variables.

Theoretical Bases of Present Research

The present research arose from the above work and from a theory of mood originated by Robert E. Thayer (Thayer, 1978, 1989). In this theory, mood is assumed to be closely associated with central states of general bodily arousal with conscious components of energy (vs. tiredness) and tension (vs. calmness). Two-dimensional models of mood have gained increasing acceptance in recent psychological research. The same two dimensions as the arousal-related ones described above are sometimes given other descriptive labels (e.g., Positive and Negative Affect; Watson & Tellegen, 1985).¹ The emphasis on general bodily arousal in this conceptualization indicates that many systems of the body (e.g., cardiovascular, skeletal-muscular, and cognitive) interact in a somewhat general or holistic manner together with positive and negative moods. One relevant implication of these assumed general arousal conditions in relation to

¹ Alternatively, two slightly different dimensions are often assumed (e.g., Russell, 1980). A circumplex model of mood is another theoretical alternative (Larsen & Diener, 1992). In one sense, the differences between these various conceptualizations are not great because they often have to do with different rotation solutions for factor-analytic derived dimensions concerning self-report data. However, they are likely to be of greater importance if fixed biological mechanisms underlying the dimensions are considered.

mood regulation is that change in one system is likely to simultaneously affect other systems.

According to Thayer's theory, self-regulation of mood involves behaviors that modulate energy and tension to optimal levels. Moreover, an important part of this theory is that a self-regulated shift in either dimension (primarily), or in both dimensions in a complex interaction may be sought by an individual to produce the optimal mood. Use of this two-dimensional model allows understanding of certain self-regulation phenomena in which a mood regulator (e.g., nicotine, alcohol, sugar, or exercise) appears in some circumstances and in some post-ingestion time frames to activate, and in others to deactivate, the individual. Examples in the experimental literature of how these apparent paradoxical reactions may occur with the same mood regulator have been discussed elsewhere (Thayer, 1989; Thayer, Peters, Takahashi, & Birkhead-Flight, 1993) and therefore will not be reviewed here.

An additional point deriving from Thayer's theory is that these preferred levels of energy and tension might be higher under certain conditions (e.g., required physical activity or active social interactions) and lower under other conditions (preparing for sleep). Furthermore, optimal mood states are assumed to be associated with reduced tension and higher energy (calm-energy), but many people (e.g., Type A persons) probably find a moderate degree of both tension and energy to be pleasurable (tense-energy). Finally, the most negative mood states are assumed to involve a combination of relatively lower energy and higher tension (tense-tiredness). Optimal moods other than those described above could be different under circumstances in which people seek to maintain bad moods (e.g., Parrott, 1993), but we assume that such negative moods are not commonly sought unless they involve either a moderate degree of energy or, at least, relatively low levels of tension.

To summarize these points in a way directly relevant to the empirical studies to be presented below, it would be predicted that self-regulation of mood to optimal levels could depend on a wide variety of activities that either raise energetic arousal, reduce tense arousal, or affect the two systems simultaneously (Thayer, 1991). Because our biopsychological mood theory assumes an integral relationship among various physiological and psychological systems, activities such as exercise or techniques involving control of thoughts, and physiological responses such as skeletal-muscular relaxation, all would be integrally related to mood improvement. For example, moderate exercise has proved to be one of the most effective mood-regulating behaviors, probably because its primary mood effect is enhanced energy, but a secondary effect is reduced tension (Thayer et al., 1993). Furthermore, because negative moods in particular are assumed to have an important cognitive underlay (Thayer, 1989), cognitive restructuring strategies would be important in mood regulation.² Finally, because skeletal-muscular tension is assumed to be an integral part of tense arousal (Thayer, 1989), behaviors that affect this bodily system would be important in mood regulation.

The present research was based on the above work on mood, mood regulation, and associated individual differences. In a series of studies, we hoped to elucidate behaviors that are commonly used to regulate common moods that many people ex-

perience daily. Additionally, we wished to place those self-regulatory behaviors in a meaningful theoretical framework and in a modest way to test that theory. Furthermore, we hoped to obtain information about the relative efficacy of the various behaviors that people use, because this would have great practical value. Finally, we sought to interpret these self-regulatory behaviors in the context of important individual differences.

Study 1: Identifying Mood-Change Categories³

Although previous research identified a variety of behaviors that people use for dealing with negative moods, there was some inconsistency in those results. Therefore, we sought to systematically distinguish the most common behaviors and activities that are used by adults to change a bad mood. Also, because of our theoretical orientation, which indicates that mood can be conceptualized with two dimensions (Thayer, 1989), we wished to identify the behaviors used specifically to enhance energy and reduce tension.

As an overview, our strategy was to obtain a fairly heterogeneous age and occupational sample of adults and to request anonymous open-ended written answers about various aspects of self-regulation. With this method, we hoped to impose as little structure as possible on the kinds of answers that people would provide about mood regulation and thus to obtain a wide array of responses. These responses could then be content analyzed, enabling us to use the resultant categories to construct a fixed-response questionnaire. Such an instrument would facilitate further studies of mood change efficacy and of individual differences in mood regulation.

Method

This study involved 68 women and 34 men who ranged in age from 18 to 88 years. Most were college students from various upper-division classes, and many of these were returning students. However, half of this college-student population were Introductory Psychology Subject Pool participants. About a third of the other respondents were professionals and nonprofessionals from the general population, and 20% of our sample were members of a local Leisure World Retirement Community.

Respondents provided written answers to a variety of general questions regarding methods used to modify bad moods, as well as to change energy and tension states (e.g., If you are in a bad mood, do you believe it is possible to change that mood? If so, how do you usually do it?). We assured participants of their anonymity before they agreed to answer our questions.

Results and Discussion

The written answers were read thoroughly and discussed by three researchers, and 32 categories of behavior were distinguished that covered methods of changing bad moods, enhanc-

² A cognitive intermediary is probably also involved in energy-modulating behaviors (e.g., Wright & Brehm, 1984), but in comparison with tension variations, energy modulation is assumed to be more closely tied to such broad biological variables as health, sleep, time of day, food, and exercise.

³ We thank Mary Ann Cejka and Bonnie Shrewsbury for their excellent work on this study (Thayer, Cejka, & Shrewsbury, 1989).

ing energy, and reducing tension. There was full agreement about the 32 categories, but as a partial test of this agreement, kappa scores were computed on independent scorings by two judges of three items from 35 questionnaires (average $\kappa = .82$).

There was a great deal of overlap across methods of changing different kinds of moods. However, the relatively small number of categories mainly resulted because we summarized and combined similar answers. For example, one of the categories in response to changing a bad mood was designated *call, talk to, or be with someone*, and in our judgment, this constituted three similar kinds of responses. Another category was designated *control thoughts* (think positively, concentrate on something else, don't let things bother me, give myself a "pep talk"), and this also involved several similar kinds of responses included on the questionnaire in parentheses after the name of the condition. Our aim was to combine similar behaviors as much as possible so as to arrive at a relatively small number of different categories of mood-changing behaviors. Thus, the fixed-response questionnaire that we planned to construct would be easy for subjects to complete. (Space limitations do not allow presentation of the 32 obtained categories here, but the questionnaire items described in Studies 2 and 4 correspond to these categories.)

As expected, categories obtained for energy-raising and tension-reducing behaviors tended to be similar to categories relating to general and undifferentiated mood states. For example, of the 17 categories of behavior reportedly used to raise energy, only 2 were not part of the 29 categories used to change a bad mood. And of the 22 behavioral categories reported to reduce nervousness, tension, or anxiety, only one was not part of the 29.

The most commonly reported categories regarding changing a bad mood were affiliative-communicative (e.g., call, talk to, or be with someone); cognitive self-control (e.g., give myself a pep talk); analysis-reflection (e.g., try to figure out why the mood occurred). Other common categories involved exercise and listening to music. The most reported categories regarding short-term activities usually used to enhance energy were drinking caffeinated beverages, eating, exercising, and listening to music. In response to questions about short-term activities usually used to reduce nervousness, tension, or anxiety, the most reported categories were affiliative-communicative, exercise, relaxation techniques, rest, music, and food.

Study 2: Strategies, Success, and Individual Differences in Changing a Bad Mood⁴

Although the data from Study 1 provided useful answers concerning ways in which people try to change a bad mood, raise energy, and reduce tension, the population was too restricted for adequate generalization. Furthermore, we hoped to learn more about important individual differences that may exist regarding these behaviors. Finally, we hoped to obtain information about the relative efficacy of different methods used to self-regulate mood. Therefore, a second study was planned in which the categories obtained above could be placed into a fixed-response questionnaire and administered to a more representative sample of the general population. With this questionnaire, we also

planned to obtain ratings about the relative success of different behaviors.

Method

Subjects

The 308 respondents included 191 women and 110 men (7 were missing gender identification) ranging in age from 16 to 89 years (mean = 34.5 years, $SD = 20$). Education levels included for 93, 6–12 years of school; for 172, 13–16 years; and for 31, 17+ years (12 were missing information). With regard to occupation, 50 were high school students; 95 were college students; 42 were retired; 34 were manual and service workers; and 73 were professional, business, and social service workers (plus 14 other). On the basis of self-identifications of weight, the sample included 31 rated as underweight, 191 rated as average, and 79 rated as overweight (7 were missing information).

Questionnaire

From the findings of Study 1, a three-part questionnaire was constructed. Instructions included requests to "Indicate the usual way that you try to change a bad mood" (Part 1); "Indicate what activities you usually use to prepare yourself if you are tired (fatigued), and in a short while (within 30 minutes) you have something to do that requires alertness and attention (energy)" (Part 2); and "Indicate what activities you usually use if you are nervous, tense or anxious, and you try to change that feeling" (Part 3). Among the various questions asked in Study 1, questions similar to these three appeared to elicit the widest array of responses and yet to meet the theoretical aims of our research. Items were included and grouped on the basis of previous content analyses (Part 1 = 29; Part 2 = 17; Part 3 = 22). Although there was some difference, content in the items in Parts 2 and 3 tended to parallel that of Part 1, as might be expected if energetic and tense arousal are the two main components of mood. However, individual items reflected the specific subject of each part, where appropriate. For example, in Part 2 the relevant item indicated, "Evaluate or analyze the situation to determine the cause of the fatigue" as opposed to "determine the mood cause" in Part 1.

As a means of identifying important items that might have been left out in these groupings, each of the three parts included a section in which respondents were asked to list common behaviors that they use and that were not included in the list. In each part, the questionnaire also requested that respondents indicate their most common way of changing the bad mood and that they rate the success of that way on a 9-point Likert-type scale. Finally, common demographic information was requested, and in order to obtain an additional general individual-difference measure, the Extraversion scale of the Eysenck Personality Questionnaires (EPQ; H. J. Eysenck & S. B. Eysenck, 1985) was included at the end of 69 questionnaires administered to college students.

Procedure

All participants were volunteers, and special care was taken to assure them that their responses to the questionnaire would be anonymous. Because anonymity is so important in a study such as this, we informed subjects in advance about how they would place their completed and unsigned forms in a manila envelope together with others, or mail them in unidentified envelopes. Approximately 500 questionnaires were dis-

⁴ We thank Bonnie Shrewsbury for her fine work on this study as well as the first one, and Janet Metz for her work on this study (Thayer, McClain, Shrewsbury, Metz, & Newman, 1991).

tributed to those indicating interest among eight different upper-division college psychology classes, two high school sociology classes, a retirement community club, and family, friends, and coworkers of the research team. Respondents completed questionnaires at their leisure and returned them at the next meeting or by mail. The return rate was approximately 62%.

To obtain test-retest reliability information about the questionnaire, four experimenters administered the questions personally to 30 subjects on one occasion; experimenters then met once again with each subject and asked the same questions 1–4 weeks later. This represented a deviation from the usual self-recording procedure followed by the other 278 subjects in our sample. (Except for the reliability findings, other results reported below included data obtained from the first testing of these 30 subjects.)

Results and Discussion

Test-retest reliability analyses were completed in two ways. In the first method, factor scores were calculated for each subject (six for Part 1, and three each for Parts 2 and 3) and correlated in the usual way across the two test occasions. These correlations ranged from .54 to .81, with a median of .76. Second, correlations were obtained for each of the 30 subjects across the two occasions (68 items). The median correlation for these analyses was .73.

The following results include only those obtained in Part 1 (methods to change a bad mood). Results of Parts 2 and 3 concerning energy and tension are presented in Study 4 below, because the results were somewhat different, and because they also involve analyses from Study 3.

Individual Item Responses

In order of frequency, the usual behaviors used to change a bad mood were call, talk to, or be with someone (54%); control thoughts (e.g., think positively, concentrate on something else, don't let things bother me, give myself a "pep talk") (51%); listen to music (47%); avoid thing (person) causing bad mood (47%); try to be alone (47%); evaluate or analyze situation to determine mood cause (47%); try to put feelings in perspective (44%); change location (e.g., go for a drive or go outside) (44%); rest, take a nap, close eyes, or sleep (42%); exercise (this may include taking a walk) (37%); engage in pleasant (fun) activities (35%); use humor (e.g., laugh or make light of situation) (34%); eat something (34%); and watch TV (movie) (32%). (Note that in some discussions below we have combined "Control thoughts. . ." "Evaluate or analyze. . ." and "Try to put feelings in perspective," and thus, the most frequently reported behavior to change a bad mood could be classed as cognitive techniques.)

Considering only the most commonly reported Number 1 ways to change a bad mood, the descending order was: call, talk to, or be with someone; control thoughts; be alone; rest, nap or sleep; tend to chores; exercise; and listen to music. The frequencies of these responses correspond fairly closely to the results obtained in the more limited Study 1 above.

Relative success of behaviors for mood change. On the basis of responses chosen by at least 10 subjects, the order of means of rated success of the reported Number 1 ways was: exercise

(7.2 = mostly successful); listen to music (7.1); call, talk to, or be with someone (6.8); tend to chores (6.7); rest, nap, or sleep (6.7); control thoughts (6.6); evaluate or analyze situation (6.6); put feelings in perspective (6.4); avoid thing (person) causing mood (6.4); be alone (6.0 = between *sometimes* and *mostly successful*).

Individual differences in mood-change behaviors. Table 1 provides the statistically significant differences (*t* tests) that were obtained for the mood-change items as a function of demographic variables. Age, education, and personality analyses were based on median splits, whereas occupation and weight analyses were based on appropriate self-rated categories. As can be seen, there were a substantial number of differences, with gender accounting for the largest amount, followed closely by age, emphasizing the importance of these variables in mood regulation. Given the diversity of the various differences obtained, we shall comment on these results below in the section on factor analysis and in the general discussion.

Additional questionnaire responses. The fixed-response questionnaire items appeared to be quite inclusive in the respect that there were only 12 responses in the section where subjects were asked about common behaviors engaged in, but not listed. Six of these individualized responses appeared to fit one or a combination of our categories. Of the remaining six, two indicated that they played a musical instrument, one indicated no bad moods, one allowed the mood to change by itself, one indicated getting caught up in the mood, and one did something out of the ordinary. With this relatively small number of isolated responses, it appeared to us that the items included in the questionnaire adequately sampled the behaviors that people commonly use to change a bad mood.

Factor Analyses

Although knowledge of individual behaviors used to change a bad mood is useful, groupings or common dimensions underlying these behaviors may provide very important information about commonality across behaviors and also provide information about more general strategies. Thus, exploratory principal axes factor analyses and varimax rotations were completed on all responses to the 29 items. There was no clear indication about how many factors to rotate on the basis of commonly accepted criteria, probably because of the relative independence of these 29 behavioral categories. There was a slight elbow in the eigenvalue function at three factors. However, we decided that the six-factor solution was the most psychologically interpretable. Because of this uncertainty about how many factors to rotate, we present both the six- and three-factor solutions below. Our presentation, however, mainly focuses on the preferred six-factor solution. Eigenvalues of the first six unrotated factors were 3.93, 2.24, 1.64, 1.50, 1.34, and 1.30 (see Table 2).

Factor 1 was named *Active Mood Management* because it appears to include active attempts to control the bad mood. In relation to the mood theory underlying this investigation (Thayer, 1989), this mood-change strategy includes elements related to both tension reduction (relaxation techniques and stress management) and energy enhancement (exercise). Also, as would be consistent with a general arousal response, the fac-

Table 1
Significant Differences in Mood Regulation Behaviors as a Function of Various Demographic Characteristics

Behaviors	Demographic characteristics					
	Gender	Age	Education	Occupation	Weight	Personality
Emotional activity	F***	Younger***	Less*	Nonprofessional***		
Go shopping	F***					Extravert*
Engage in hobby	M***					
Use humor	M***			Professional*		
Have sex	M**			Professional*		
Eat something	F**	Younger***	Less**		Over**	
Call, talk to someone	F*		Less*			
Control thoughts	M*					
Be alone		Younger***			Under**	Introvert***
Listen to music		Younger***			Under**	
Pleasant activities		Younger**				
Tend to chores		Older***			Over*	
Religious/spiritual		Older**				
Smoke cigarettes			Less**			
Stress management			More*			
Change location				Professional**		
Avoid cause of mood					Over**	
Drugs						Introvert*

Note. M = male; F = female; younger = below median age; older = above median age; less = below median education; more = above median education.

* $p < .05$. ** $p < .01$. *** $p < .001$.

tor contains a central cognitive-change element (put feelings in perspective, evaluate, or analyze). Self-ratings of success of individual items making up this factor place it first in efficacy ($M = 6.8$).⁵

Men had slightly higher factor scores for this dimension, but these differences were not consistent. For example, professional women had higher scores than professional men. Compared with people in all other occupations, professionals also had the highest factor scores on this dimension, $t(306) = 1.91, p < .06$, but this difference is weak. Considering the self-ratings of success, this factor and Factor 2 would appear to be the most efficacious as change strategies.

Factor 2 was named *Seeking Pleasurable Activities and Distraction* because the highest loading items appear to involve enjoyable behaviors that may divert attention from the bad mood. This dimension has a flavor of active engagement, although here the behaviors appear to be more indirect than those represented in Factor 1. Self-ratings of success (6.4) place this factor second in efficacy. Men were much more likely than women to use this change strategy, $t(299) = 4.0, p < .001$, as were professionals compared with people in other occupations, $t(306) = 2.04, p < .05$.

Factor 3 was named *Passive Mood Management* partly because it appears to involve less active engagement than the first two dimensions. Furthermore, watch TV; eat something; and rest, nap, or sleep, seem to be passive ways of reacting to the bad mood. And although go shopping would appear to be active, another interpretation is that this strategy simply places a person in a pleasant environment. Finally, this behavior probably is only an indirect way of controlling the bad mood. (Regarding the assumed passive nature of shopping, analyses of the item grouping may provide an important observation about the mo-

tivation underlying this behavior. The factor grouping suggests that the motivation is the same as that involved with watching TV, resting, or eating.) Women were much more likely than men to use this strategy, $t(299) = 3.08, p < .01$.

Factor 4 was named *Support, Ventilation, and Gratification*. This complex name reflects our uncertainty about the common elements of the behaviors making up this factor. Like Factor 3, this factor also does not appear to involve active engagement with the mood. The first item, call, talk to, or be with someone, might be regarded as seeking social support. However, the factor grouping, and particularly, engage in emotional activity, suggests that call, talk to, or be with someone could be a way of ventilating emotions rather than obtaining social support. However, social support probably is somewhat involved. This strategy and the previous one (Factor 3) were self-rated as less efficacious (5.8 and 5.6, respectively = *sometimes successful*) than strategies represented in Factors 1 and 2. Women were much more likely than men to use this strategy, $t(299) = 5.23, p < .001$. Also, education was negatively correlated with use of this strategy, $t(294) = 3.90, p < .001$ (median split). For example, high school students use this strategy to a greater degree than do

⁵ This rating of factor success, and subsequent ones reported for the other factors in this study and Study 4, are somewhat unreliable because they included all items for which any subjects indicated that the behavior was their Number 1 way of dealing with the mood, and therefore made a success rating. However, for some items, only a small number of Ss provided success ratings, while for other items the number was greater than 10 (our cutoff point for reporting success ratings elsewhere based on reliability considerations). Factor success ratings were means obtained from individual item ratings that were weighted by factor loading.

Table 2
Preferred Six-Factor Solution and Alternative Three-Factor Solution (Varimax Rotations) of Usual Way to Try to Change a Bad Mood

Factor and method	Six-factor solution	Three-factor solution
Factor 1 = Active Mood Management		
Relaxation techniques	.52	.51 ^a
Stress management activities	.51	.36 ^a
Put feelings in perspective	.44	.44 ^a
Evaluate or analyze situation	.41	.40 ^a
Exercise	.39	.38 ^a
Shower, bath, splash water	.36	.30 ^a
Control thoughts	.33	.47 ^a
Have sex	.31	.37 ^a
Humor	.30	.54 ^a
Engage in self-gratification		.37 ^a
Factor 2 = Seeking Pleasurable Activities and Distraction		
Engage in pleasant activities	.49	.50 ^b
Humor	.48	
Engage in hobby	.43	.36 ^b
Listen to music	.39	
Change location	.38	.40 ^b
Avoid thing (person)	.37	
Control thoughts	.30	
Factor 3 = Passive Mood Management		
Watch TV	.45	.50 ^b
Coffee or caffeinated beverage	.38	
Eat something	.37	.56 ^b
Rest, nap or sleep	.36	.35 ^b
Go shopping	.34	.30 ^b
Factor 4 = Social Support, Ventilation and Gratification		
Call, talk to, or be with someone	.56	.32 ^b
Engage in emotional activity (e.g., cry, scream)	.44	.44 ^b
Smoke cigarettes	.38	
Eat something	.37	
Avoid thing (person)		.34 ^b
Factor 5 = Direct Tension Reduction		
Use drugs (other than alcohol, cigarettes, or coffee)	.69	.73 ^c
Drink alcohol	.43	.42 ^c
Have sex	.43	.30 ^c
Factor 6 = Withdrawal-Avoidance		
Try to be alone	.66	.28 ^c
Avoid thing (person)	.34	
Engage in emotional activity (e.g., cry, scream)	.30	

Note. The following items were reported, but did not load at least .30 on any factor: engage in religious/spiritual activity, read or write, and tend to chores.

^a Factor 1. ^b Factor 2. ^c Factor 3.

other groups, $t(306) = 6.13, p < .001$. In general, use of this strategy was negatively correlated with age, $t(295) = 5.68, p < .001$ (median split).

Factor 5 was named *Direct Tension Reduction* because it appears to deal directly with the tension component of a bad mood. It was rated least successful of the six factors (3.5 = *seldom successful*). Men were more likely than women to report use of this strategy, $t(299) = 2.75, p < .01$.

Factor 6 was named *Withdrawal-Avoidance* because of the first two items, try to be alone, and avoid thing (or person). Apparently, persons choosing this strategy do not confront the causes of the bad mood, but instead they simply withdraw. Younger people were more likely to use this strategy, $t(295) = 4.72, p < .001$. And, in what would seem to be an expected finding, introverts are more likely to report this strategy for mood change than extraverts, $t(67) = 3.00, p < .05$. An unexpected finding that is difficult to interpret, except possibly with reference to theories of body type (Sheldon, 1942), was that people self-rating themselves as underweight had higher factor scores on this dimension than average and overweight people, $t(299) = 2.34, p < .05$. Self-rating of success of individual items (6.3) place this factor third in efficacy.

In the three-factor solution, the first factor combined the first two factors of the six-factor solution. Thus, it has a flavor of active management of mood together with engaging in distracting and pleasurable activities. Men were much more likely to use this combined strategy, $t(299) = 4.32, p < .001$, as were professionals, $t(295) = 3.04, p < .01$. The second factor in this three-factor solution combined Passive Mood Management with Social Support, Ventilation, and Gratification. Younger people were much more likely to use this strategy, $t(295) = 5.21, p < .001$, as were women, $t(299) = 4.49, p < .001$, heavier people, $t(299) = 2.15, p < .05$, and less educated people, $t(294) = 1.98, p < .05$. The third factor of this three-factor solution appeared to combine Factors 5 and 6 above (Direct Tension Reduction and Withdrawal-Avoidance). Younger people score higher on this factor, $t(295) = 2.72, p < .01$, as do extraverts, $t(67) = 2.18, p < .05$.

Study 3: Validation of Success and Individual Differences in Bad Mood Change

The self-ratings of success for different mood-change behaviors that were obtained in Study 2 provided some indications of the efficacy of the six mood-change strategies. However, it was unclear how valid these ratings were because individuals rated success of behaviors that they usually use (their Number 1 way), and these persons might have found other behaviors to be more successful if they were used instead. Moreover, the degree of distorting influence from personal bias in these ratings was unclear. An independent and more authoritative judgment of relative success was necessary for more confident conclusions about efficacy of the various strategies. Therefore, the present research was designed to obtain that confirmatory judgment. A further purpose of the present study was to learn more about pronounced gender differences among four of the strategies.⁶

⁶ Parts of this study were presented previously as a paper at the American Psychological Society (Thayer, Newman, & McClain, 1992).

Our plan in this study was to use the judgments of mental health professionals to obtain further information about how successful each strategy would be. Our choice of practicing psychotherapists to rate relative effectiveness of the various strategies was based on the belief that such professionals frequently encounter questions about dysfunctional moods and how to change them. Regardless of whether they can answer those questions satisfactorily, at the least, these individuals usually have regularly considered such matters in their work.

Method

Twenty-six doctoral-level psychotherapists who were members of a local mental health association returned mailed questionnaires in this study. These included 24 PhDs, 1 EdD, and 1 MD. There were 15 men and 11 women, and they had a mean level of professional experience of 17.2 years. The six mood-change strategies obtained in Study 2 (without factor names) were listed in counterbalanced random order, and respondents were requested to rate each strategy for probable success in changing a bad mood if that strategy were principally used by the person (9-point Likert-type scale, with anchors including *always* [successful], *mostly*, *sometimes*, *seldom*, and *never*). Furthermore, to obtain more information about the important gender differences found in Study 2, respondents also were asked to indicate whether they thought there were any gender differences for success with each strategy.

Results and Discussion

A high degree of interrater agreement was found concerning likelihood of success for various strategies (coefficient $\alpha = .98$). The two strategies rated as having the most probable success were Active Mood Management (Factor 1), and Seeking Pleasurable Activities and Distraction (Factor 2). These strategies were viewed as *mostly successful* (ratings = 7.0 and 6.6, respectively). Support, Ventilation, and Gratification (Factor 4) was viewed as *sometimes successful* (rating = 4.7). Passive Mood Management (Factor 3) and Withdrawal-Avoidance (Factor 6) were viewed between *seldom* and *sometimes successful* (ratings = 4.2 and 3.9, respectively). Direct Tension Reduction (Factor 5) was viewed as *seldom successful* (rating = 3.2).⁷

Rating differences were statistically significant, $F(5, 25) = 47.12, p < .001$. The relative rankings of strategies (i.e., 1, 2, 4, 3, 6, and 5) were quite consistent with self-ratings of strategy success obtained in Study 2 (i.e., 1, 2, 6, 4, 3, and 5). The only difference involved Strategy 6 (Withdrawal-Avoidance), which Study 2 participants self-rated as third in success, and therapists rated as fifth in likely success. This consistency of results between two studies involving different methods appears to confer a kind of convergent validity to the findings.

In the present study, ratings by mental health professionals of the likelihood of success by gender also were consistent with findings from Study 2. Compared with men, women were rated as likely to be more successful with Strategy 3 (13 rated women as likely to be more successful vs. 2 who rated men likely to be more successful, and 11 rated both sexes equal), and Strategy 4 (18 rated women vs. 1 rated men, and 6 rated men and women as equal). Compared with women, men were rated as likely to be more successful with Strategy 2 (8 rated men vs. 1 rated woman, and 17 rated men and women as equal), and Strategy 5

(12 rated men vs. 0 rated women, and 14 rated men and women as equal). Thus, in this study, the judgments by professionals indicated that men versus women would be relatively more successful, with the same strategies that the two sexes indicated in Study 2 being the ones more likely to be used by each. As above, the consistency of these results involving different methods lends confidence to the findings. Ratings of Strategies 1 and 6 indicated little gender difference.

Study 4: Strategies, Success, and Individual Differences in Energy and Tension Change

The principal focus of Studies 2 and 3 was change of negative mood, without further differentiation of the type of mood. But in the present study, short-term energy enhancement and tension reduction were our focus (Parts 2 and 3 of the questionnaire described in Study 2). In a general sort of way, these moods correspond to Positive and Negative Affect, as they are often defined (Watson & Tellegen, 1985). However, because of the way the questions were posed concerning energy, that part of the study, at least, may have a more limited arousal association.

To review once again certain points made above, if the major variance of a single undifferentiated mood construct may be understood with two dimensions, then responses concerning general mood questions should have relationships with responses concerning each of the two more limited mood dimensions. Study 1 above did indicate this relationship because the methods people described to change a bad mood corresponded more or less to categories of behaviors described for energy enhancement and tension reduction, the two mood dimensions assumed to compose the general mood construct (Thayer, 1989).

Moreover, we believe that this assumed relationship among mood constructs could be especially useful in the present study because of the results collected concerning success of general mood-change strategies. In particular, if our sample of psychotherapists (Study 3) provided valid judgments of the relative value of different general mood-change strategies, a point that is likely considering the correspondence with subjects' self-ratings, then it should be possible to judge the efficacy of energy and tension-related behaviors and strategies in part by analyzing the actions of the people who use good and bad mood-change strategies. In other words, we assumed that the people who use the best mood-change strategy also use the best strategies to raise energy and reduce tension, the two major components of mood. Thus, in part of this study we used these criteria to judge efficacy concerning behaviors used for energy enhancement and tension reduction.

An additional reason for this study was to test certain theoretical propositions by Robert E. Thayer by observing general usage patterns, particularly of the most successful mood change

⁷ In a potentially valid comment, one anonymous rater indicated that Direct Tension Reduction may have immediate success, although in the longer term it would have little success. In our view, the immediate reinforcement value of drugs and alcohol is probably the basis of their continued use in the face of their long-term lack of success (cf. Thayer, 1987a).

Table 3
Significant Differences in Energy Regulation Behaviors as a Function of Various Demographic Characteristics

Behaviors	Demographic characteristics					
	Gender	Age	Education	Occupation	Weight	Personality
Call, talk to someone	F**			Nonprofessional**		
Eat something	F*	Younger**				
Keep busy	F*		Less*			
Listen to music		Younger***	Less**			
Shower/bath, water						
Drink alcohol			Less**			
Drugs				Nonprofessional*		
Outside, fresh air				Professional*		
Exercise						Extravert*

Note. F = female; younger = below median age; less = below median education.
 * $p < .05$. ** $p < .01$. *** $p < .001$.

strategies. For example, Thayer's theoretical work predicts that moderate exercise is one of the best ways to raise energetic arousal (Thayer, 1978, 1987a, 1987b; Thayer et al., 1993). That theory also predicts that skeletal-muscular tension and cognitive variables are important antecedents of tense arousal (Thayer, 1989).

Method

In the present study, we used data collected in Study 2 (Parts 2 and 3 of the Mood Regulation Questionnaire) and partially analyzed on the basis of the results from Study 3. Thus, the data collection, sampling, and descriptions of subjects in this study were as indicated above.

Results and Discussion

Item Responses for Energy Enhancement

Frequency and relative success. In order of frequency, the most common behaviors used for short-term increases in energy were rest, take a nap, close eyes, or sleep (68%); take a shower, bath or splash water on face (55%); go outside and get some fresh air (45%); do something to keep busy (43%); drink coffee or caffeinated beverage (41%); listen to music (41%); eat something (37%); and exercise (this may include taking a walk) (28%); call, talk to, or be with someone (28%); control thoughts (e.g., give oneself a "pep talk") (27%).

On the basis of responses by at least 10 subjects, the order of means of rated success in short-term ways of enhancing energy were control thoughts (7.5 = *mostly successful*); listen to music (7.3); take a shower, bath, or splash water on face (7.2); exercise (7.1); rest, take a nap, close eyes, or sleep (7.0); do something to keep busy (7.0); eat something (6.5); and drink coffee or other caffeinated beverage (6.3 = between *mostly* and *sometimes successful*).

Individual differences. Statistical analyses (t tests) were based on the same divisions as those described in Study 2, and the results are presented in Table 3. The smaller number of observed behavioral differences, compared with Study 2, is partly based on the lesser number of test items in this section. However, compared with those in Study 2, it may be noted that the

magnitudes of the observed differences were somewhat smaller on the whole in this study.

Additional questionnaire responses. The fixed-response questionnaire items appeared to be reasonably inclusive, but there were 19 responses in the section where subjects were asked about common behaviors engaged in but not listed. Of these, 11 were judged to fit one of the existent categories, although not exactly. Of the remaining 8, most included responses that were related to those included in the other two sections, but not Part 2. Two indicated prayer, 1 laughter, 1 read a magazine and drink tea, 1 play music, 1 meditate, 1 turn up the radio, and 1 have sex.

Factor Analyses

After principal axes factor extractions, three factors were rotated to varimax criterion (on the basis of the scree test), and they included eigenvalues of 2.29, 1.52, and 1.47 (see Table 4).

The first factor is characterized primarily by activity, including physical, social, and cognitive behaviors. This factor involves doing something, whether it be changing location, getting some fresh air, talking to someone, or exercising. Of the three factors, mean self-ratings by questionnaire respondents (6.8 = *mostly successful*) ordered this group of behaviors as the best at raising energy in a short period. Further evidence of the value of this approach to energy enhancement was that those using the most successful mood-change strategy in Study 2 (Active Mood Management) were most likely to use this strategy as well ($r = .48$, $p < .001$). The only statistically significant demographic predictor of use of this strategy was age, with younger people more likely to use this strategy, $t(295) = 2.59$, $p < .01$.

The second factor is almost the opposite of the first with regard to activity, and we have named it *Reduced Activity and Rest* on the basis of the two major items concerning watching TV and resting or sleeping. The mean success rating of this strategy was 6.1 (between *sometimes* and *mostly successful*). The third factor, named *Caffeine, Food, and Passive Stimulation*, included use of stimulating substances together with TV. Younger people, women, and those who were less educated were more likely to report using this strategy, respective $t(295, 299, 294)$

Table 4
Strategies Employed for Short-Term Energy Enhancement

Factor and method	Factors		
	1	2	3
Factor 1 = Activity: Physical, Social, Cognitive			
Change location	.56		
Call, talk to, or be with someone	.46	.22	.22
Go outside and get some fresh air	.43		
Exercise	.42	-.21	
Evaluate or analyze for cause of	.42	.15	
Do something to keep busy	.37		.19
Control thoughts	.30		
Listen to music	.26		
Use relaxation techniques	.22		-.21
Factor 2 = Reduced Activity and Rest			
Watch TV (movie)	.16	.46	.35
Rest, take a nap, close eyes, or sleep		.37	
Take a shower/bath or splash	.22	-.34	
Drink alcohol		.15	
Factor 3 = Caffeine, Food, and Passive Stimulation			
Drink coffee or caffeinated beverage		-.31	.39
Eat something			.37
Smoke cigarettes			.27

= 3.24, 2.61, $p < .01$; 2.15, $p < .05$. It was rated as slightly more successful (6.2) than the second factor, and people who reported using this strategy also reported using the Study 2 mood-change strategy of Social Support, Ventilation, and Gratification ($r = .40$, $p < .001$).

It is useful to view relationships between individual behaviors to raise energy, and the most successful mood-change strategy from Study 2 because of the evidence from therapists about the efficacy of the latter strategy. Correlation tests indicated that those using Active Mood Management to change a bad mood were most likely to use exercise, relaxation techniques, and evaluate or analyze to raise energy (respective r s = .34, .34, and .33, $p < .001$). These behaviors are quite consistent with the mood theory that we used (Thayer, 1989).

Item Responses for Tension Reduction

Frequency and relative success. In order of frequency, the most common behaviors used to reduce nervousness, tension, or anxiety were call, talk to, or be with someone (59%); control thoughts (e.g., think calming thoughts, tell oneself to calm down, and try not to think about problem or situation; 58%); listen to music (53%); exercise (44%); use relaxation techniques (e.g., deep breathing, stretching and bending, muscle relaxation, massage, and visualization; 44%); rest, take a nap, close eyes, or sleep (37%); engage in nervous behavior (e.g., pacing, bite nails, and bite pencil; 31%); engage in stress management (e.g., get organized, plan ahead, and make lists; 31%); and tend to chores (e.g., housework, schoolwork, and gardening; 27%); watch TV (movie) (27%); eat something (26%); take shower/bath, jacuzzi, or splash water on face (26%).

On the basis of responses by at least 10 subjects, the order of means of rated success in reducing tension were engage in

religious/spiritual activity (7.5 = *mostly successful*); listen to music (7.2); tend to chores (7.1); exercise (7.1); call, talk to, or be with someone (6.9); relaxation techniques (6.7); control thoughts (6.6); stress management activities (6.4); and rest, nap or sleep (6.3 = between *mostly* and *sometimes successful*).

Individual differences. Statistical analyses (t tests) were based on the same divisions as those described in Study 2, and the results are presented in Table 5. It may be noted that the pattern of differences in this study of tension regulation is more comparable with the pattern in Study 2 (bad mood change) than was the pattern in the energy-regulation study above. This greater comparability also tends to be true for reported frequency of tension and bad-mood change behaviors. However, it does not hold for reported success of behaviors to change the various moods. Comparability is important because it could be an indication that changing a bad mood is more a matter of tension reduction than it is of energy enhancement. However, the mixed results leave this assertion uncertain.

Additional questionnaire responses. The fixed-response questionnaire items appeared to be quite inclusive, but 12 subjects made responses in the section designated for behaviors not listed. Of these, 9 were judged to fit one of the existent categories or a combination of categories. The remaining 3 indicated they would take a drive or get away.

Factor Analyses

Following principal axes factor extractions, three factors were rotated to varimax criterion (based on the scree test), and they included eigenvalues of 2.56, 1.85, and 1.55 (see Table 6).

The first factor was named Emotional Expression, Food, and Drugs. It included emotional ventilation, eating, alcohol, and cigarette use, among other behaviors. This strategy was more likely to be endorsed by those who were younger, $t(295) = 4.09$, $p < .001$; less educated, $t(294) = 2.59$, $p < .01$; female, $t(299) = 2.43$, $p < .01$; and more heavy, $t(299) = 1.95$, $p < .05$. The rated success of this strategy was the lowest of the three factors (6.1). The correlation pattern indicated that those using this factor were more likely to use the sometimes successful mood-change strategy from Study 2 (Social Support, Ventilation, and Gratification). For energy enhancement, these people were more likely to use the sometimes successful Study 2 strategy, Caffeine, Food, and Passive Stimulation.

The second factor, named Muscle Relaxation, Cognitive Control, and Stress Management, was rated as less successful (6.3) than the third factor, and this second-place rating is inconsistent with our guiding theory, which would have predicted the most success for this strategy. However, even though the self-rated success was only second, this strategy was the one most used by those employing the best mood-change strategy (Active Mood Management; Study 2; $r = .52$, $p < .001$), and it was the most used by those reporting the best energy enhancement strategy (Activity: Physical, Social, Cognitive; $r = .46$, $p < .001$). This strategy was likely to be used by younger people, $t(295) = 4.13$, $p < .001$, and least likely to be used by heavier people, $t(299) = 2.64$, $p < .01$.

The third factor, named Pleasant Distraction, was self-rated as best (7.1 = *mostly successful*) of the three. It involved such

Table 5
Significant Differences in Tension Regulation Behaviors as a Function of Various Demographic Characteristics

Behaviors	Demographic characteristics				
	Gender	Age	Education	Occupation	Weight
Call, talk to someone	F**	Younger**			
Have sex	M**				
Emotional activity	F**				
Smoke cigarettes	F**		Less**		
Engage in hobby	M*				
Rest, nap, or sleep	M*				
Go shopping	F*				Over*
Tend to chores	F*	Older**			Over*
Listen to music		Younger***	Less**		
Nervous behavior		Younger***			
Shower/bath, jacuzzi		Younger**	Less**		
Relaxation techniques		Younger**			
Control thoughts					
Read or write		Older***			Over*
Religious/spiritual					
Stress management			More**		
Exercise			More*	Professional**	
Eat something					Over***
Watch TV					Over*
Rest	M*				Under*

Note. F = female; M = male; younger = below median age; older = above median age; less = below median education; more = above median education.

* $p < .05$. ** $p < .01$. *** $p < .001$.

pleasant and distracting activities as hobby, shopping, and chores. Another indication of the success of this factor is that it was a close second choice of people commonly using the most successful energy enhancement strategy (Factor 1; $r = .45$). However, of the mood-change strategies (Study 2), individuals using the sometimes successful, Passive Mood Management, were most likely to use this strategy ($r = .48$, $p < .001$). This strategy was likely to be used by older, $t(295) = 2.14$, $p < .05$, and more heavy people, $t(299) = 2.27$, $p < .05$.

As above, it is useful to view relationships between individual behaviors to reduce nervousness, tension, or anxiety and the most successful mood-change strategy from Study 2. Correlation tests indicated that those using Active Mood Management to change a bad mood were likely to use stress management activities, exercise, and relaxation techniques to deal with nervousness and anxiety (respective r s = .38, .35, .34, $p < .001$).

General Discussion

In this series of four studies, we systematically identified, categorized, and evaluated the effectiveness of the behaviors that are usually used to self-regulate mood. Although our aim was to focus on all kinds of mood-regulating behaviors, these studies concentrated more on self-regulation of negative moods than positive ones. Nonetheless, this greater emphasis is consistent with the predominance of research in the area. Our method of open-ended and fixed questionnaire assessment, together with opportunities for subjects to add behaviors not included in our lists, appears to have representatively sampled the general domain of self-regulating behaviors. We judge this success on the

basis of the consistency of our results with results of other similar studies of mood regulation.

A notable positive element of our research approach was its careful emphasis on the anonymity of subject report, a matter that is particularly important when socially undesirable and illicit substance use may be a significant part of the behavior under study. A drawback of this method is that we were dependent on anonymous reports of what people do, as opposed to behavioral observations. Nevertheless, from our identification of the domain of self-regulating behaviors, a natural research progression would be to check our categories with other analyses of mood-regulating activity, including ongoing experience sampling and behavioral observations. Issues of social desirability are sufficiently significant, however, that these alternative approaches require strict attention to matters of anonymity, and that is often difficult.

The effectiveness of various mood-regulating behaviors is another question that our research addressed. Again, we were dependent in part on potentially less valid self-ratings. But we have confidence in these findings, in part because of the considerable agreement between the ratings of actual effectiveness made by our subjects and the ratings of likely effectiveness provided by a sample of experienced and practicing psychotherapists. This agreement included not only the relative effectiveness of general behavioral strategies for all people, but also the differential effectiveness by gender. Furthermore, we have confidence in these results because our findings agree in large measure with the results of other kinds of related research, including studies involving depression reduction, gender differences, social sup-

Table 6
Strategies Used to Reduce Nervousness, Tension, or Anxiety

Factor and method	Factors		
	1	2	3
Factor 1 = Emotional Expression, Food, and Drugs			
Engage in emotional activity	.50	.20	.17
Eat something	.50		.20
Drink alcohol	.38		
Smoke cigarettes	.36		
Engage in nervous behavior	.32	.32	
Call, talk to, or be with someone	.31		
Use drugs	.23		
Listen to music	.19	.18	
Factor 2 = Muscle Release, Cognitive Control, and Stress Management			
Use relaxation techniques		.55	
Control thoughts		.51	
Stress management		.42	.22
Take shower, bath, jacuzzi	.22	.22	.19
Factor 3 = Pleasant Distraction			
Engage in hobby			.44
Go shopping	.24	-.18	.41
Tend to chores			.38
Don't drink coffee or caffeinated beverage			.33
Watch TV (movie)			.27
Have sex	.19		.27
Engage in religious/spiritual acts			.24
Read or write			.22
Exercise		.16	.20

port, cognition, exercise, food, and drug use. These various covariations provide a certain construct validity for the findings of effectiveness.

What Behaviors Are Used and How Effective Are They?

After combining similar behaviors into behavioral categories, we found a relatively small number of different methods of mood regulation (32 categories). Moreover, there was almost complete overlap between the methods people use to change a bad mood and the methods that they use to reduce tension and raise energy (possibly more overlap between bad mood and tension reduction). Some form of social interaction and the use of various cognitive techniques probably constitute the most common methods of self-regulation, particularly to change a bad mood and to reduce tension. In the context of energy-raising and tension-reducing behaviors, some other categories also were reported, together with the above behaviors. For example, rest, or activities such as splashing water on one's face, getting fresh air, and ingesting caffeine are commonly used for subsequent energy enhancement, whereas relaxation techniques and stress management are often used for tension reduction.

Of all the separate behavioral categories described to self-regulate mood, a case can be made that exercise is the most effective. This behavior was self-rated as the most successful at changing a bad mood, fourth most successful at raising energy, and third or fourth most successful at tension reduction. Furthermore, even though exercise was not ranked first in regulating energy and tension by all subjects, its value is apparent by

its primary use by some knowledgeable individuals. We see this if a kind of expert status is attributed to the subjects in Study 2 who most use the strategy judged by our panel of psychotherapists as best for changing a bad mood. Those "expert" individuals are most likely to use exercise to energize themselves and are likely to use it second for tension reduction.

A somewhat unexpectedly successful behavioral category used for mood regulation is music. The item listen to music was frequently indicated as a method of mood regulation. It was self-rated as second in success at changing a bad mood, as well as raising energy and reducing tension. Social interaction also was self-rated as among the more successful behaviors, particularly for changing a bad mood and reducing tension (rated third and fifth). This is consistent with other research concerning the value of seeking social support for dealing with stress (Cohen & Willis, 1985; Pennebaker, 1990). Different kinds of cognitive techniques were rated as mostly successful for all three kinds of mood. For example, control thoughts (give oneself a "pep talk") ranked first for energy enhancement. The success of cognitive techniques is consistent with much research concerning cognitive approaches to depression (e.g., Beck, 1976; Hagga, Dyck, & Ernst, 1991).

The activities that we define as distraction (chores, hobby, fun activities, TV, shopping, read, and write) were given relatively high success ratings for changing a bad mood (except for TV). However, only a small number of people reported common use of most of these behaviors, and this limits the reliability of the obtained success ratings for distraction techniques. As a means of reducing anxiety, tension, or nervousness, the behavioral cat-

egories of stress management, exercise, and relaxation were most often used by those "expert" subjects from Study 2 who use the best strategy for changing a bad mood.

Finally, among commonly employed behaviors, some relatively less effective means of changing a bad mood involve trying to be alone and avoiding the person or thing that caused the bad mood. Eating and TV watching also were rated as less effective for tension reduction compared with other behaviors. Similarly, coffee was rated as less effective in raising energy than seven other behavioral categories.

There is fairly close agreement in effectiveness judgments of behaviors reported in our studies and those in the three other similar studies that were reviewed. As discussed above, our research evidence indicated that exercise might be ranked as the single best method of regulating mood, and this behavior was ranked a close second to religious practices in the Gallup poll (Gallup & Castelli, 1989).⁸ It was also ranked third in the Rippere (1977) study. Parker and Brown (1982) did not include this category. Cognitive techniques were ranked moderately high in our studies, as well as the three comparison studies, particularly if the Gallup category that we labeled religious practices were classed as a cognitive technique (their category was prayer, meditation, and bible reading). One slightly divergent finding concerned listening to music. This was the second best method in our sample, but it was not as highly ranked in the other studies (Rippere and Gallup ranked music 6th, Parker and Brown ranked it 10th).

Among the diverse behaviors identified, we believe that six general strategies to change a bad mood commonly occur. Also apparent are three general strategies to raise energy and three to reduce tension. These strategies range from active to passive, and this active-passive distinction may be the most important differentiation.

The general strategy, Active Mood Management, clearly was the most successful at changing a bad mood. This can be judged both from self-ratings and psychotherapist ratings. This strategy is a combination of relaxation, stress management, cognitive, and exercise categories. Less successful strategies include Passive Mood Management (e.g., TV, caffeine, food, and sleep) and Direct Tension Reduction (e.g., drugs, alcohol, and sex). Pleasant Distraction was self-rated as most successful at reducing tension, whereas Activity (including physical, social, and cognitive techniques) was rated as most successful at raising energy.

The factor structure of these general strategies is not as strong as might be desirable. However, that is perhaps due to the fact that they combine relatively independent behavioral categories. We believe that future studies separating these behavioral categories into individual behaviors would strengthen this factor structure. Nevertheless, these factors provided meaningful differentiations in our research.

Gender and Other Individual Differences in Mood Regulation

A large number of individual differences were obtained in both individual behavioral categories and general strategies of mood change. Of these, perhaps the most important in relation to currently active research on mood were the findings of gender

differences. On the basis of our results, men and women clearly use different strategies for changing bad moods. They also differ in how they attempt to self-regulate energy and reduce tension.

In changing a bad mood, men were more likely to use the strategy that we called Seeking Pleasurable Activities and Distraction, or a second strategy, Direct Tension Reduction, including use of alcohol and drugs. On the other hand, women tended to use Passive Mood Management or a second strategy, Social Support, Ventilation, and Gratification (talk to someone, emotional activity, food, and smoke). These differences hold for energy enhancement and tension reduction as well. For both moods, women are more likely to call, talk to, or be with someone. They also are more likely to use the general strategy, Caffeine, Food, and Passive Stimulation to raise energy.

Our results may have direct relevance to research that shows that women are twice as likely as men to be depressed (McGrath et al., 1990; Nolen-Hoeksema, 1987). These observed differences in frequency of depression might be due to men's use of mood-change strategies that are less likely to lead to depression. This idea appears to have validity if one focuses on the greater likelihood of men to use the successful strategy, Seeking Pleasurable Activity and Distraction to change a bad mood, and women to use the less successful strategies, Passive Mood Management, or Social Support, Ventilation, and Gratification for bad-mood change.

However, there are at least two cautionary points with this interpretation. Our results indicated that there were no significant gender differences for the most successful mood change strategy, Active Mood Management. Whereas men tend to use this strategy slightly more than women, subgroups differ in use. For example, professional women are more likely to use this strategy than professional men. A second cautionary point occurs because men are more likely than women to use Direct Tension Reduction (e.g., alcohol) to change a bad mood, and this strategy had one of the lowest success ratings. Of course, even if Direct Tension Reduction is a dysfunctional strategy, the gender-depression hypothesis could still be valid because this strategy may not lead to depression. Instead, there may be other negative effects such as increased aggression (Bushman, 1993).

Our results clearly support some of the arguments of Nolen-Hoeksema (1987, 1991) and her colleagues regarding strategies used to avoid depression. These researchers maintained that men are more likely to use active mood-change strategies such as pleasant distraction, whereas women are more likely to use less active rumination responses in which they focus on the de-

⁸ As with the Gallup poll, in our sample (Study 2), religious-spiritual practices was the most highly rated in success (8.1), but less than 3% of our respondents indicated that this was their Number 1 way, and therefore rated the success of that category (cf. Sethi & Seligman, 1993). However, our results parallel the Gallup poll results quite well in other respects. We wondered whether the high percentage endorsing religious responses in the Gallup poll had anything to do with the questions asked because the poll was commissioned by the Christian Broadcasting Network. We were told that this would not have been the case, and the alternative suggestion was made that our low percentage may have been due primarily to our use of Californians for our sample (George Gallup, Jr., personal communication, September 15, 1993).

pression, as well as the causes and the consequences of the depression. The strategies used by men are viewed as more successful, and this is hypothesized to be the basis of the observed gender differences in diagnosed depression.

Consistent with Nolen-Hoeksema's hypotheses, our research showed that men are more likely than women to use the successful strategy, Seeking Pleasant Activities and Distraction, to change a bad mood. In addition, we view the female strategies of Passive Mood Management and of Social Support, Ventilation, and Gratification as less active than the male ones. Furthermore, there is some evidence of greater rumination by women about negative moods because they are more likely to endorse the items, call, talk to, or be with someone, and engage in emotional activity.

However, some of our results may not support the ideas of the Nolen-Hoeksema group. First, as mentioned above, although pleasant distraction is a relatively successful strategy, it is not the most successful strategy. A second point of possible divergence is that our questionnaire item, evaluate or analyze the situation to determine the cause of the mood, was clearly part of the most successful strategy, and furthermore, men were more likely to endorse this item than women. Nolen-Hoeksema's contention that focusing on the cause of the depression is part of the dysfunctional ruminative strategy engaged in by women appears to be contradicted by these results. But it may be quite functional to consider the cause of the bad mood (or of depression) if this does not result in an obsessive consideration.

Turning to our other results concerning individual behavioral categories used for various kinds of mood change, the item, engage in emotional activity, was much more likely to be endorsed by women than men. At first thought this might be seen as reflecting the well-known tendency of men to avoid reporting emotional expression. However, we believe that this may be more than simply a reporting difference, and instead it could reflect central gender differences in behavior (cf. Fujita, Diener, & Sandvik, 1991). Men, on the other hand, were much more likely to report engage in a hobby or have sex. Again, we believe that this may indicate genuine gender differences, not just reporting differences.

Women also reported eat something, both for changing a bad mood and for energy enhancement. And if this reflects a basic gender difference in mood regulation, it could be important in various other areas of research. Our search of the literature concerning this gender difference yielded some consistent questionnaire evidence (Funabiki et al., 1980), and in one experiment, women ate more under a manipulated condition of stress whereas men ate less (Grunberg & Straub, 1992). Indirect evidence of this phenomenon also may be seen in the literature that shows a greater tendency of women than men to be diagnosed with eating disorders (e.g., Hsu, 1989).

Finally, some of our findings probably would be expected. For example, self-rated overweight people reported eat something to change a bad mood, and they indicated that they were less likely to exercise to raise energy. In other expected findings (cf. H. J. Eysenck & M. W. Eysenck, 1985), introverts were likely to try to be alone to change a bad mood, and extraverts were more likely to report exercise for energy enhancement. Although these results are not surprising, they do provide a kind of con-

struct validation for our approach to understanding mood regulation.

Test of a Two-Dimensional Mood Theory

This research was conceived in part as a modest test of a general mood theory (Thayer, 1989), and there were a number of notable results in that regard. For example, this theory holds that there are two primary mood dimensions, energetic and tense arousal. The results of Studies 1, 2, and 4 are consistent with this idea in the sense that the categories of behavior reportedly used to change a bad mood overlapped almost completely with methods used when people attempt to raise energy and to reduce tension. Of course, this does not prove that the two dimensions represent the basic elements of mood, but it does indicate that when people try to regulate energy and tension, they generally use the same behaviors that they use to change general states that they identify as bad moods.

A related theoretical assumption is that successful methods of mood regulation probably involve increases in one kind of arousal (energy) together with decreases in the other kind (tension). Patterns of mood-regulating behaviors that simultaneously increase and decrease these different kinds of arousal are apparent if we examine the most successful strategy for changing a bad mood, as determined in Study 2. The factor Active Mood Management had loadings on behavioral items commonly associated with both kinds of changes. For example, two items are clearly associated with reducing tension (relaxation techniques and stress management techniques). Within this model, control of anxiety-producing thoughts would primarily reduce tense arousal, but energetic arousal may also be increased by such techniques as "give myself a pep talk." Exercise was also highly loaded on this factor, and increases in energetic arousal from moderate exercise have been well documented (for reviews see Thayer, 1989; Thayer et al., 1993; also see Revelle, 1993).

Still another related theoretical point concerns the conception of mood as a general arousal state. With an arousal model, many systems of the body are assumed to interact in a somewhat integrated or holistic manner. Once again, considering Active Mood Management (Study 2) as an example, it is apparent that cardiovascular, respiratory, skeletal-muscular, and cognitive systems, among others, all interact. Thus, the best strategy for changing a bad mood (Study 2) involves such behaviors as exercise, and relaxation techniques, together with, put feelings in perspective, and control thoughts.

A last kind of evidence of the biopsychological model of mood on which this research is based comes from a broad examination of the individual categories and the successful strategies used for changing bad moods, enhancing energy, and reducing tension. Clearly these items and strategies are consistent with a model that incorporates general biological variables with likely physiological mediating mechanisms. Almost half of the 32 behavioral categories qualify directly in this respect (e.g., exercise, rest, nap, or sleep; relaxation techniques; splash water on face; eat something; drink coffee; and emotional activity). And if cognitive responses are seen as having their greatest effect through tension reduction, the number is much greater. A con-

sideration of the entire set of categories suggests that mood involves the whole body. It is not a purely mental phenomenon, as it is often treated.

Future Research

Although we have attempted to survey a broad range of mood-regulating behaviors, we probably have not assessed the total universe of mood states. For example, Tice and Baumeister (1993) have found that anger states may involve different strategies than those designated simply as "bad moods." Also, attempts probably are made to self-regulate sexual moods, as well as the more purely cognitive moods such as what Nowlis (1965) called *Concentration, Skepticism, or Nonchalance*. Moreover, there may be a broader range of positive moods than we sampled. Although all of these mood states tend to fall in the two-dimensional space that we used (Watson & Tellegen, 1985), it is not clear that the mood-regulating behaviors and strategies that we identified would apply in all of these cases. Thus, more extensive surveys may be necessary.

Another potentially valuable research approach would be to incorporate the various metamood scales (e.g., Mayer & Gaschke, 1988) among the strategies that we identified, including those rated as more or less successful. Additional worthwhile research might focus on the individuals who use the best and worst mood-change strategies to determine more information about them. It would be useful to know, for instance, what trait or dispositional characteristics identify these individuals (e.g., Watson & Clark, 1993).

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