

Cognitive Domains of the Mood System

John D. Mayer and Michelle H. Marnberg

State University of New York at Purchase

Alton J. Volanrh

Rensselaer Polytechnic Institute

ABSTRACT One possible outline of the interrelationship between mood and cognition makes use of a fourfold framework: *mood-state introspections* yield a report of the mood, *mood-sensitive judgments* are influenced by mood, *meta-mood experiences* include thoughts about the mood, and *mood-related traits* predict the likelihood of being in a mood. Three studies were conducted to investigate the relation between mood introspection and mood-sensitive judgment (e.g., mood-related changes in judgments about "objective" events such as belief in the probability of a nuclear war). These same studies also examined the metamood experiences and mood-related traits occurring simultaneously with the above moods and judgments. Judgment was mood-sensitive across all studies. Factor analysis of the various measures was supportive of the partial independence of the four domains. Mood introspection, mood-sensitive judgment, and mood-related traits appeared on separate factors. Metamood experience was factorially complex and was distributed across factors. Interrelations among the domains were described. The relevance of the framework for representing personality and psychopathology was discussed, as was the influence of mood on everyday judgments.

Understanding the interrelationship of psychological systems such as mood and cognition is one of the fundamental missions of personality

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psychology (Wundt, 1897, p. 26) The task of elucidating the mood-cognition system, however, is a complex undertaking because the variables that need to be studied far outnumber the usual set of independent and dependent variables found in experimental studies (cf. Berscheid, 1982, Campos & Barrett, 1984, Izard, 1977, Lang, 1984, Mayer, 1986) Despite this, productive research linking cognition and mood has taken place (Alloy, Abramson, & Viscusi, 1981, Blaney, 1986, Bower, 1981, Isen, 1984, Mayer & Salovey, in press, Teasdale & Fogarty, 1979)

Much of the research linking mood and cognition can be organized according to four domains of mood-cognition interaction that have been addressed (a) *mood-state introspection* (Diener & Emmons, 1984, Nowlis, 1965, Russell, 1979, Watson & Tellegen, 1985, Zevon & Tellegen, 1982), (b) *mood-sensitive judgment* (Alloy, Abramson, & Viscusi, 1981, Bower, 1981, Isen, Shalke, Clark, & Karp, 1978, Mayer & Volanthe, 1985, Nelson & Craighead, 1977, Velten, 1967), (c) *metamood experiences* (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986), and (d) *mood-related personality traits* (cognitive self-concept, Costa & McCrae, 1980, Emmons & Diener, 1986, Gotlib & McCann, 1984, O'Malley & Gillette, 1984) Table 1 contains the central descriptive elements of each of the four proposed domains

The first domain is primary to emotion researchers. Mood-state introspection is composed of processes that read out physiological, motor, and cognitive information indicative of mood. Because the readout is "privileged" in the sense that it is available only to the individual experiencing the mood (Ericsson & Simon, 1980), it is often considered the single best mood measure (e.g., Nowlis, 1965). Mood-state introspection is typically measured by participants' responses on a Mood-Adjective scale.

Mood-sensitive judgments are of most interest to cognition and affect researchers, these judgments change with mood even though the logic underlying the judgments is often independent of mood. For example, subjects who estimate the "likelihood of the economy improving in the next three years" will proffer a high probability estimate in a positive mood and a low one in a negative mood, even though the likelihood of an economic upturn is not dependent upon the mood of the subjects. Such cognitions are of considerable interest because they may be highly relevant to real-world decision making and subsequent behavior (Mayer & Salovey, in press). As will be seen, mood-sensitive judgments include not only probability estimates of pleasant and unpleasant events, but also

Table 1
A Schematic Outline of Four Domains of the Mood System

<i>First component</i>	<i>Mood-state introspection</i>
Description	Privileged and other information is used to identify mood
Measure	Mood-State Introspection Scale (a mood-adjective scale)
Examples	"I feel happy" "I feel guilty" "I am angry"
<i>Second component</i>	<i>Mood-sensitive judgment</i>
Description	Judgment that changes with mood
Measure	Mood-Sensitive Task Scale (e g , probability estimation)
Example	"I think an upturn in the economy is likely"
<i>Third component</i>	<i>Metamood experience</i>
Description	Cognitions that monitor, evaluate, and change mood
Measure	Metamood Experience Scale
Example	"I am thinking good thoughts to cheer myself up"
<i>Fourth component</i>	<i>Mood-related personality traits</i>
Description	Personality traits related to momentary moods
Measure	Eysenck Personality Inventory
Example	"My mood goes up and down"

aspects of person perception and advice-giving (Johnson, 1937, Johnson & Tversky, 1983, Mayer & Bremer, 1985, Mayer & Volanth, 1985)

The third domain consists of metamood experiences which are involved in an ongoing process of mood regulation. The cognitions can be divided into three types: *monitoring*, *evaluation*, and *influencing*. Monitoring cognitions involve knowledge of how clear, strong, and long-lasting the mood is. Evaluation cognitions involve assessment of how acceptable the mood is in its present form. Influence cognitions involve attempts to change mood and include such phenomena as thinking good thoughts to cheer up a bad mood. Metamood experiences may be critical to an understanding of how mood introspection and mood-sensitive judgment interact (Ellis, 1985, Folkman et al., 1986, Isen, 1984). This is because metamood experiences may control or reflect mood influences on judgment, and for that reason, reports of such experiences may reveal when judgment is being influenced by mood. In this paper, a Metamood Experience scale containing items such as, "I am thinking good thoughts to cheer up a bad mood," has been developed to measure these internal events.

The fourth domain, mood-related traits, may predict some aspects of mood-state introspections, as well as characteristic metamood experi-

ences People high on Eysenck's neuroticism dimension experience negative mood-states more frequently than people who score low, those high on extraversion experience more positive mood-states (Costa & McCrae, 1980) Since judgment is influenced by both state and trait-mood (Gotlib & McCann, 1984, Hamilton, 1983), it may be that when state and trait influences are used together, stronger predictions to judgment shift can be made (Mayer & Salovey, in press)

Introduction to the Present Studies

The present studies collectively examine the interactions between mood and judgment and the influences that moderate them Three central issues are examined across all studies and are as follows

Which judgments shift with mood, and when do they do so? Mayer and Volanth (1985) suggested that mood influences an extremely broad range of cognitive tasks and presented evidence that advice-giving, probability estimation, and word ratings are all mood-influenced If so, it should be possible to generate several more tasks that reflect this broad judgment shift Demonstrations of such effects will indicate the phenomenon is now well understood The breadth of tasks that are mood-sensitive will indicate the relevance of the present research to other areas of personality and social psychology

Secondarily, one can inquire into the conditions under which mood predicts judgment shift Isen (1984, 1985) has suggested that effects should be stronger for people in good moods because they invariably think good thoughts, whereas people in bad moods are inconsistent in their thoughts, they sometimes think bad thoughts and other times actively intervene in their bad moods by trying to think positively Isen, Clark, and Schwartz (1976) have also suggested that moods change quite rapidly, and therefore that cognitions must be in close temporal proximity to the mood measure to show effects This question will be addressed in Study 2

Are the hypothesized domains of the framework independent of one another? A fundamental question regarding mood-state is how best to represent it The fourfold framework presented here is broader than that used in the past Although the four domains can be defined as partially independent of one another, they are not necessarily *empirically* independent.

To test whether the domains are independent, representative variables will first be identified for each part of the framework, and these assorted variables will then be factor analyzed. For instance, mood is most commonly represented according to a two-dimensional framework such as by pleasant-unpleasant and arousal-calm factor dimensions (Russell, 1979, 1980). An alternative two-dimensional scheme, with slightly different theoretical implications, is to rotate these first two factors 45 degrees so as to obtain positive-tired and negative-calm dimensions of mood (Diener & Emmons, 1984, Watson & Tellegen, 1985, Zevon & Tellegen, 1982). Alternatively, mood introspections can be represented by scales that measure individual moods such as happiness or fear. The other domains of the framework are also each represented by one or more variables. If all variables from each of the domains are examined together, their factorial structure should support the fourfold framework developed at the outset of this article.

If there are multiple mood domains, will variables from each domain predict judgment shift? In order to support the initial framework, the four components must be partially independent of each other, as noted above. For example, past research has suggested that mood-sensitive judgment and mood introspections are not only theoretically distinguishable, but empirically distinguishable as well (e.g., Bower & Cohen, 1982, Johnson, 1937, Johnson & Tversky, 1983, Mayer & Bremer, 1985, Mayer & Volanth, 1985). Despite the fact that the two are far from synonymous, they are related, with correlations between individual judgment tasks and mood falling in the range between $r = .15$ to $r = .30$ (through aggregation such relationships can be increased). If all the domains specified are truly part of mood-cognition interaction, then domains such as metamood experience should also predict mood-sensitive judgment.

Brief Overview of the Individual Studies

Each of the following studies focuses on one of the above issues. A preliminary study was conducted to examine the simple relation between mood and mood-sensitive judgment. It tests understanding of mood-sensitive judgment by examining whether newly conceived tasks do indeed correlate with mood. Study 1 focuses on the four mood-cognition domains together and their prediction of mood-sensitive judgment. Study 2

continues this line of inquiry, and also examines the issue of mood change over time

Preliminary Study

The preliminary study was conducted to add new mood-sensitive tasks to those already in use in order to demonstrate that the effect is well understood and reliable. Several proven mood-sensitive judgment tasks, several new tasks, and an adjective scale constructed to measure mood introspection were piloted. Although this was a preliminary study, the scales used will be presented in some detail as they are repeated without change in Studies 1 and 2.

METHOD

Subjects were 206 students (122 women, 84 men, age range, 16 to 40, $M = 20$), some from De Anza and Cañada community colleges who participated as volunteers during regularly scheduled class time, and the remainder from the University of Santa Clara, who participated as part of an introductory psychology subject pool.

Materials

Four sets of scales used in the present study (in order of presentation) were the Mood-Sensitive Task scales, the Mood-State Introspection scale, an initial version of the Metamood Experience scale, and a short form of the Eysenck Personality Inventory.

Mood-sensitive task scale

Six tasks hypothesized to be mood-sensitive were arranged into Forms A and B.

Advice-giving (first task, Form A) Subjects read nine brief vignettes about people facing life decisions. After each vignette, they selected one of four advice alternatives. These alternatives varied from positive to negative, with the positive responses expressing confidence in the individual or optimism about the situation, and the negative responses expressing lack of confidence in the individual or pessimism about the situation. For example, one vignette concerned the advice for a young person beginning a difficult sales position. The gist of the advice alternatives ranged from "Quit before you're

fired" to "Stick with it—you're making progress." Each advice response was assigned a positivity value based on ratings by independent judges. Total score was the summed positivity of the items endorsed by the subject (time 10 minutes). This task was modified from Mayer and Volanth (1985).

Probability estimation (second task, Form A) Stimuli were 16 statements concerning war, illness, health, and professional, economic, and social success. Scoring was for the difference in probability estimation of the 8 pleasant versus 8 unpleasant events (expressed as percentages). People in good moods were expected to predict that pleasant events occur more frequently than other events (time 5 minutes). Versions of this task have been used in several earlier studies (Bower & Cohen, 1982, Johnson & Tversky, 1983, Mayer & Bremer, 1985, Mayer & Volanth, 1985).

Word ratings (third task, Form A) Subjects rated a set of 15 words on the number of thoughts, images, and concepts brought to mind. Scoring was for the rating of the number of concepts brought to mind by the 6 positive minus the 6 negative items, with neutral items excluded (time 5 minutes). This task was modified from Mayer and Volanth (1985).

Attitude valence (first task, Form B) The Attitude Valence scale was a short version of Tomkins's (1965) Polarity scale. Tomkins hypothesized that many historically recurring attitudes could be classified according to two categories. The first viewed human nature as negative, undisciplined, and requiring control (e.g., "Play is childish—adults should refrain"). The second viewed human nature as basically positive, complex, and best approached with flexibility (e.g., "Play is important for all human beings"). Ten item pairs were selected on the basis of their high scores on an item index presented by Tomkins (1965), except that items mentioning emotion were excluded. It was hypothesized that people in positive moods would hold more positive attitudes (time 5 minutes). A test of the affect-sensitive qualities of this task was new to this study.

Person perception (second task, Form B) In the person-perception task, subjects read a one-paragraph fictitious biography, and then responded to 7 statements about the character's life. They then repeated this procedure for a second biography. Seven of the 14 total questions were phrased in pleasant ways ("People who meet Jim think he is interesting"), and 7 in unpleasant ways ("Jim will be divorced"). Responses were along a 5-point scale from "strongly agree" to "strongly disagree." Total score was the total agreement with positively toned inferences about the person minus the total agreement with negatively toned inferences. This score was expected to rise with pleasant mood (time 7 minutes). This task was new to this study.

Example choice (third task, Form B) In example choice, participants were given a set of 18 categories (e.g., "possessions," "personality," "type of worker"), each followed by 3 representatives of the category which varied in affective tone. Thus, the category "possessions" was followed by "gun," "musical instrument," and "computer." Participants were instructed to "choose the *most typical* example of the category." Scoring was for the pleasantness of the examples chosen (as rated by independent judges), which was expected to rise with good mood (time: 5 minutes). This task was new to this study.

Geometric forms and handwriting Two filler tasks Forms A and B each contained a brief motor task. Originally intended as mood-sensitive measures of motor performance, these tasks, which included measures for the expansion and contraction of handwriting, had failed to correlate with mood in one earlier study (e.g., Mayer & Volanth, 1985). They also failed to correlate with mood in the preliminary study. They were included as filler tasks in Studies 1 and 2, in the interest of brevity they will be treated as filler tasks here as well.

Mood-State Introspection scale

The Mood-State Introspection scale used in this and subsequent studies was modified from Russell's (1979) Mood-Adjective scale so as to (a) expand sampling of the mood spectrum, (b) simplify vocabulary, and (c) use equal numbers of positive and negative words. The scale adjectives were sampled from 10 domains: (1) *happy*, (2) *sad*, (3) *calm*, (4) *fearful /anxious*, (5) *loving*, (6) *angry*, (7) *energetic*, (8) *tired*, (9) *miscellaneous positive* and (10) *miscellaneous negative*. A total of 62 adjectives were used, and subjects were instructed to use the scale to describe their present mood (time: 5 minutes).

Metamood Experience scale

A trait scale to measure metamood experiences was designed and piloted but discarded as unsuccessful. The scale format contained item constructions such as "I usually _____" and "When I feel happy _____," which are typically associated with trait scales. In contrast, the moods and mood-sensitive judgments under examination were occurring at a particular moment in time. Two problems arose from this situation. First, people endorsing trait-style items regarding their typical metamood experience may not be experiencing those same thoughts at testing time. Second, trait scales require retrospective introspections which may not be as valid as introspections of state phe-

nomena (Ericsson & Simon, 1980) It seemed prudent, therefore, to attempt an alternative, state-oriented measurement of metamood experiences in the main studies To save the reader's time, the present scale is not further reported

Short form of the Eysenck Personality Inventory

A short form of the Eysenck Neuroticism/Extraversion scale (Eysenck, 1973) was used The items on the factor-based Neuroticism scale deal with mood swings rather than mood valence and so the items' relation to good or bad mood is not obvious to subjects (e g , "I am sometimes happy, sometimes sad, for no apparent reason") The extraversion items are entirely opaque in their relation to mood

Procedure

Forms A and B of the mood-sensitive tasks were collated into booklets, and the Mood-State Introspection, Metamood Experience, and Eysenck scales were appended to the end of each This order alerted subjects to investigative interest in mood only *after* the mood-sensitive tasks had been completed The two different forms were haphazardly alternated in a stack and then passed out in sequence to groups of subjects All instructions were included in the test booklets themselves, although the experimenter repeated some of the more important instructions (e g , "Do not go back to an earlier section of the booklet")

RESULTS

The results of the preliminary study first establish the reliability and factor validity of the Mood-Introspection and the Eysenck scales, and secondly examine whether those tasks hypothesized to be mood-sensitive were so in fact

A forced, two-factor, principal components analysis with a varimax rotation was used to represent both the Mood-Introspection and Eysenck scales Marker variables from a recent review of mood factor scales (Watson & Tellegen, 1985, p 221) unambiguously defined each factor of the Mood-Introspection scale as identical to those extracted from most other contemporary mood scales The two unrotated components were (I) pleasant-unpleasant and (II) arousal-calm mood When rotated, these become (I') positive- and (II') negative-affect measures of mood

Similarly, the Eysenck scale had a first unrotated component identical to that found by Gray (1981), and rotated components of Eysenck. The unrotated component was (I) neurointroversion-stabextraversion (referred to by Gray as anxiety). The rotated versions were (I') neuroticism and (II') extraversion. The 12 items on this very brief scale all loaded higher than .42 on their intended scale, with most between .55 and .75, and all loaded within the range of about $- .20$ to $+ .20$ on the remaining scales. Thus both the mood and mood-related trait scales used here had substantial factorial validity.

The means, standard deviations, and coefficient alpha reliabilities of the scales may be seen in Table 2. In the case of the Mood-Introspection scale, items loading $+/- .25$ or more on the unrotated scales or $+/- .40$ or more on the varimax-rotated scales were summed. These differential cutpoints for loadings were used to equalize reliabilities of the scales, as well as to lower correlations between the Watson & Tellegen (1985) measurement of positive-tired and negative-calm affect on the rotated scales. The original item scales suggested by Eysenck were used for the measures of neuroticism and extraversion.

The relationship between self-report of mood and mood-sensitive tasks can also be seen in the first rows of Table 2. Five of the six tasks showed significant relationships with mood. Because two of those tasks are new, the study increases the pool of mood-sensitive tasks available for examination. When the sample was divided into groups according to whether the subject's mood was above or below the mean on the pleasant-unpleasant dimension, the pleasant mood group showed higher mood-judgment correlations than the unpleasant group on only one out of six tasks, thus contradicting the traditional asymmetry hypothesis found with experimental mood-inductions.

The hypothesis tested in the preliminary study was that mood-state covaries with a broad shift in judgment, and in fact, five of six judgment tasks, including two new ones, correlated with mood. In addition, the piloted Mood-Adjective scale and Eysenck Short Form both showed good to excellent coefficient alpha reliabilities and factorial validity sufficient for further study.

Study 1

The preliminary study clearly demonstrated the breadth of judgment shift across varied cognitive tasks. It further demonstrated the reliability and

Table 2
Selected Scale Statistics and Intercorrelations for Measures Within the Mood-Cognition Domains Preliminary Study

	Mood scales			Trait scales		
	Pleasant- unpleasant	Positive affect	Negative affect	Neurotic- version	Neurotic-stable	Extravert- introvert
<i>Mood-sensitive tasks</i>						
Advice-giving	.19*	14	- 20*	- 13	- 07	20*
Probabilities	.36****	37****	- 28****	- 37****	- 35****	09
Word rating	.22*	23**	- 14	- 19*	- 19*	04
Attitudes	.08	12	- 05	- 17	- 11	11
Person perception	.28***	29***	- 23**	- 25**	- 16	24**
Example choice	.26**	32***	- 16*	- 21*	- 14	08
<i>Scale statistics</i>						
Mean	26 06	55 06	40 08	- 03	- 8 46	- 7 82
Standard deviation	28 67	14 89	16 01	4 92	1 85	1 50
Reliabilities	96	95	95	71	73	53

* $p < .05$

** $p < .01$

*** $p < .005$

**** $p < .001$

factorial validity of measures of mood introspection and mood-related traits to be used in the present studies

Study 1 measures the four domains of the mood-cognition framework discussed in the introduction, in comparison with the preliminary study, it adds in a Metamood Experience scale to measure experiences of current mood. The intent of the study is to demonstrate partial independence of the mood-framework domains, and to explore the degree of predictivity from each of the domains to the others. Particular attention is paid to the prediction of mood-sensitive judgment, because of its aforementioned potential to influence real-world decision making and behavior.

METHOD

Subjects

Subjects were 156 students from De Anza and Cañada community colleges in San Jose and the University of Santa Clara (77 men, 79 women, age range, 17 to 73, $M = 23$). Subjects from the community colleges participated in class, those from the University of Santa Clara participated as members of an introductory psychology subject pool.

Materials

Three mood-sensitive tasks comprised the Mood-Sensitive Task scale. These were repeated without change from the preliminary study: person perception, geometric forms (a filler task), probability estimation, and word ratings. The Mood-Introspection scale was repeated without change from the first study.

For the Metamood Experience scale, a series of 22 items was developed from 3 item categories: mood monitoring ("I know exactly how I feel"), mood evaluation ("I'm feeling more optimistic or pessimistic because of my mood"), and mood change ("I'm thinking good thoughts to cheer up a bad mood"). All instructions and items referred to the subjects' present experiential state. Items were mixed as to whether they pertained to a good mood, bad mood, or both, and also according to their direction of scoring. For instance, the aforementioned item, "I'm thinking good thoughts to cheer up a bad mood," was part of an item set that also included "I'm reminding myself of reality to bring down a good mood," and "It's important to experience this mood without trying to change it." The item response format was a 10-point "strongly agree—strongly disagree" scale. A short form of Eysenck's Neuroticism/Extraversion scale was repeated from the preliminary study without change.

Procedure

The Mood-Sensitive Task scale, Mood-Introspection scale, Metamood Experience scale (state version), and the Eysenck Short Form were collated into booklets. As in the preliminary study, the experimenter repeated selected instructions from the booklet to make sure they were understood by the groups of subjects.

RESULTS

Replication of basic factorial findings in the preliminary study Both the Mood-Introspection scale and the Eysenck scale yielded factorial results identical with those in the preliminary study, and the preliminary study factor scales are therefore used here. One change from the preliminary study is that the standard deviations for the mood scales (Table 3) are lower than in the preliminary study, indicating a narrower mood range.

Factor analysis of Metamood Experience scale A principal components analysis was conducted on the Metamood Experience scale. The first three factors were initially difficult to interpret and for this reason a varimax rotation was applied. The resulting first five factors were (1) introspective clarity versus introspective confusion (e.g., "I know how I'm feeling" vs "I can't tell what my present mood is"), (2) good mood versus bad mood (e.g., "I'm in such a good mood, I can't help but think good thoughts" vs "I'm in such a bad mood, I can't help but think bad thoughts"), (3) mood influence versus no influence (e.g., "My present mood is not influencing my thinking" vs "My present mood is influencing my thoughts and opinions"), (4) changed outlook (e.g., "My outlook is changed by how I feel"), and (5) mood maintenance (e.g., "I'm trying to maintain a positive mood").

Relationship between mood and mood-sensitive tasks. The correlations between mood-state and mood-sensitive tasks were somewhat lower than in the preliminary study, with the exception of the word rating task (Table 3, first column). Neither probability estimation nor person perception showed significant relationships with mood, although they show trends in the correct direction. These unexpected changes from Study 1 will be discussed below.

Asymmetrical mood effects on judgment shift In this study, those subjects with moods above the mean on the pleasant-unpleasant dimension

showed higher correlations on two of three tasks. Aggregating across Study 1 and the preliminary study, the happy subjects showed stronger mood-judgment correlations for three of nine tests. There is, as of yet, no clearly asymmetrical mood effect for the tasks as a whole.

Are the mood domains independent? Recall that one of the central questions of this article is whether the domains outlined at the beginning are partially independent. To test this hypothesis, summary measures of the several scales were entered into one large principal components analysis. Given the findings to this point, it was predicted that, first, mood-introspection variables would occupy their own factor, as would mood-sensitive task variables. Second, the metamood factors, due to their multivariate nature, were expected to be distributed across several factors. And third, because they were the sole trait measures utilized, extraversion and neuroticism were not expected to cluster with similar variables but instead were expected to have loadings across several factors.

Variables entered were as follows. The mood-introspection variables included the eight individual mood descriptors from the mood scale (happy, sad, angry, fearful, etc.). The mood-sensitive task variables included the three individual mood-sensitive tasks. The Metamood scale included the first five rotated factors, and the mood-trait variables included Eysenck's Neuroticism and Extraversion.

Because there is a strong theoretical reason to view the framework domains as interrelated, the principal components extraction was rotated to an oblique solution by the oblimin algorithm. Delta was set equal to 0, so as to maximize obliqueness. As can be seen from the structure matrix presented in Table 4, there were six factors extracted with eigenvalues greater than 1.00. Mood introspection is spread over the first two factors: calm-negative and positive-tired mood. The third factor, pessimism-acceptance, appears to be an amalgam of several framework domains. Mood-sensitive cognition is represented by the fourth factor, which loads all three judgment tasks. Metamood experience factors, as predicted, are sufficiently diverse to have loadings on all factors. Surprisingly, the two mood-related traits, neuroticism and extraversion, each have their own factors (6 and 5, respectively), where they were joined by related metamood factors. The highest correlations between factors were between Factors 1 and 2, at $r = .23$, and between 2 and 4, at $r = .24$. In all, then, the factor structure is supportive of the partial independence of the

Table 3
Selected Correlations Among the Four Mood-Cognition Components for Study 1

	Mood scales		Trait scales		
	Pleasant-unpleasant	Positive affect	Negative affect	Neurotic-stable	Extravert-introvert
<i>Mood-sensitive tasks</i>					
Probabilities	10	01	- 18**	- 15*	20**
Word ratings	42****	39****	- 33****	- 21***	30****
Person perception	08	01	- 05	- 12	- 01
<i>Scale statistics</i>					
Mean	31 95	57 99	37 83	- 8 63	- 7 68
Standard deviation	24 73	13 90	13 61	1 80	1 36

Note *N* = 152 to 155

**p* < .05

***p* < .01

****p* < .005

*****p* < .001

Table 4
Oblique Rotation of Variables Representing the Four-Domain
Framework of Mood-Cognition Interaction (Structure Matrix) Study 1

Domain	Variable	Factor					
		1	2	3	4	5	6
Mood introspection	Anger	-85				22	26
	Anxiety	-82					43
	Unhappy	-81	-40				34
	Calm	72	35	28	40		-23
	Energetic	26	90		25		-24
	Tired	-44	-84				
	Happy	40	78	27	46		-21
	Love	32	40	57	50		-23
Mood-sensitive judgment	Probability			-68	25		
	Person perception				75		
	Word ratings	34	35		66	-37	
Metamood experience	Clarity	20			28		-84
	Good mood	67	42		33		
	No influence	20	-44	30		37	
	Outlook changed					53	
	Realistic outlook			58		-43	
Mood-related traits	Neuroticism	-34	-21				71
	Extraversion		33	-20		-53	-39
Variance explained *		30%	10%	8%	7%	6%	6%

Note: Decimal points omitted. Loadings of a magnitude less than .20 are omitted.

framework components. Each domain, with the exception of the multivariate domain of metamood experience, has one or more factors defined as its own.

General predictors of judgment shift It has already been shown that mood predicts judgment shift. Both for theoretical and practical reasons it is also important to know whether variables from the other domains can match or surpass that prediction. For that reason, a multiple regression was conducted with a judgment-shift composite (unit-weighted

scores on the three mood-sensitive judgment tasks) as the dependent measure

By the factor analysis above, positive and negative affect would seem the best representatives of mood introspection from which to predict judgment shift, as they most closely represent the first and second factors of the oblique factor solution, $r(153) = -.83$ and $.74$, respectively. This elegant and theoretically interesting two-factor solution was indeed used in a number of multiple regression analyses. When comparing the two mood dimensions and their interaction with the use of the single pleasant-unpleasant mood dimension, however, we found that the single dimension adequately represented the predictive variance in all cases, as well as having the virtue of reducing the number of variables in the regression analyses (and later, the number of analyses themselves). The single pleasant-unpleasant mood dimension, which arises here before oblique rotation, will therefore be used to represent mood-state.

When the pleasant-unpleasant mood score was entered by itself, the result was a highly significant prediction of judgment shift, $R(156) = .31$, $p < .0001$. The subsequent entry of the five metamood factor scales and neurointroversion raised the correlation significantly to $R(156) = .44$, F of change = 3.3 , $p < .01$. The first, second, and third factors of metamood experience each made statistically significant contributions, $p < .05$ to $.01$, neurointroversion showed a tendency in that direction, $p < .14$. Further entry of interaction terms had no significant effect. Quite interestingly, a multiple regression with the pleasant-unpleasant mood-introspection variable *deleted* from the rest (e.g., leaving the metamood scales and trait scale variables) performed equally well as when it was present.

Predictions of the other domains In two other analyses of interest, pleasant-unpleasant mood itself was highly predicted from variables in the three other domains (with the judgment composite, the five metamood factors, and neurointroversion in a forced entry regression, $R[156] = .72$, $p < .0001$). Similarly, neurointroversion could be highly predicted (with the five metamood factors, the judgment composite, and pleasant-unpleasant mood in a forced-entry regression, $R[156] = .53$, $p < .0001$). The large number of metamood factors made discussion of their individual prediction prohibitive, although as can be inferred from the factor analyses, these, too, could be moderately predicted by regressions. Thus, each mood-cognition domain appeared moderately to highly pre-

dictable on the basis of the other mood-cognition domains, with mood introspection most highly predicted

DISCUSSION

Factor structures in Study 1 supported the four-domain framework outlined in the paper. Mood introspection and mood-sensitive judgment both occupied their own factors or factor sets. Mood-related traits also identified dimensions, supplemented by metamood experiences. The multidimensional quality of metamood experiences led them to be found alone and in combination with several other variables, across the several factors.

One problematic aspect of the study was that results from the Mood-Sensitive Task scale were substantially lower than in the preliminary study. The most likely explanation for these lower correlations between mood and judgment was the restricted mood range in Study 1. The ratio of mood variance from the preliminary study to Study 1 was 1.00/0.87, which should cause an appreciable drop in correlations. If the lower correlation level is caused by the restricted mood range of this sample, then merely replicating the experiment should remedy the difficulty.

The pattern of mood-sensitive task correlations in Study 1 was also of interest. The word rating task correlated most highly with mood and was also administered immediately before the Mood-State Introspection scale, and this raised an interesting possibility. Naturally occurring moods are typically thought of as lasting hours or days. But it may be that as the subjects proceed through the 20 minutes of mood-sensitive tasks, that their moods will undergo detectable shifts. If this is true, the Mood-State scale will be most highly correlated with those tasks that are temporally closest to it. Although there was some support for this in the preliminary study and Study 1, it was difficult to determine whether this had really occurred, because the several mood-sensitive judgment scales are differentially predictive of mood to begin with. To test whether correlations ascend toward the mood scale (due to subjects' mood-state change), the order of the mood-sensitive tasks can be fixed, and the position of the Mood-State scale can be varied. If the state-change hypothesis were correct, then the proximity of the task to the mood scale should determine the strength of mood-judgment intercorrelation, and therefore the correlation levels should descend as the task is further from the mood scale.

Study 2

Study 2 was an approximate replication and extension of Study 1. The central change was that a *mood-scale-first* versus *mood-scale-second* experimental manipulation was introduced within the correlational study in order to test the hypothesis that subjects' mood changes cause tasks that are temporally nearest the Mood-State scale to have the highest correlations with it. Otherwise, the purpose of the study was the cross-validation of the factorial and regression findings in Study 1 concerning the fourfold framework.

METHOD

Subjects

Subjects were 206 students (102 men, 104 women, age range, 17 to 51, $M = 21$) at De Anza and Foothill colleges participating during regular class time.

Design

The overall design was correlational and similar to that of the preliminary study and Study 1. There was, however, one experimental manipulation. In the mood-scale-first condition, the booklet included the Mood-State Introspection scale first, followed by the Mood-Sensitive Task scale. In the mood-scale-second condition, the order was reverted back to that used in Study 1 so that the Mood-Sensitive Task scale preceded the Mood-State scale. The order of the mood-sensitive tasks was unchanged between the two conditions. In both conditions, the last two scales were the Metamood Experience scale and the Eysenck Neuroticism scale.

Materials

The Mood-Sensitive Task scale consisted of probability estimation, example choice, geometric figures (as a filler task), person perception, and word ratings. The Mood-State Introspection scale, Metamood Experience scale, and Eysenck Short Form were repeated without change from Study 1.

Procedure

The scales were collated into booklets, ordered according to the mood-scale-first and mood-scale-second conditions. Subjects were tested in groups. The

two different forms were distributed following a pattern of several mood-scale-first booklets followed by several mood-scale-second booklets. All necessary instructions were included in the test booklet itself. As before, the experimenter repeated some of the instructions to the subjects to make sure they were understood.

RESULTS

Individual component scales The factor scales for the Mood-Adjective and Eysenck scales generated in the preliminary study were used in Study 2. This time, the mood-state variance was higher than in Study 1 (see Table 5).

The Metamood Experience scale produced three factors with high overlap with Study 1: (1) Clarity of mood was the same as Study 1, (2) bad mood/good mood was the same except reversed in direction, (3) No influence of mood on outlook emphasized the mood's lack of influence on present thinking (e.g., "My optimism is not affected by my present mood" and "My pessimism is not affected by my present mood"). (4) Good mood was unique to Study 2 (e.g., "I'm in such a good mood I can't help but think good thoughts"). Finally, (5) no influence versus influence was similar to the identically named third factor of Study 1.

To quantify the relation between these factors and those of Study 1, the factor loadings of each were intercorrelated. Coefficients of congruence showed good matches for Factors 1 and 2, $r(21) = .97$, $-.87$, and for Factor 3 in Study 1 and the present Factor 5, $r(21) = -.81$. Factors 3 and 4, however, showed low congruence with Study 1.

Relationship between mood and judgment shift. In Study 2, the mood-sensitive tasks again showed significant relationships with many of the mood and personality measures (see Table 5).

Asymmetrical mood effects on judgment shift. In this study, those subjects with moods above the mean on the pleasant-unpleasant dimension showed higher correlations on three of four tasks. Cumulating across the three studies, this means that happy subjects showed stronger mood-judgment correlations for six tasks and weaker correlations for seven. There is clearly no asymmetrical mood effect for these tasks.

Mood-scale-order experimental manipulation. Half the subjects had received the mood scale before and half after the judgment tasks. Table 6

Table 5
Selected Correlations Among the Four Mood-Cognition Components for Study 2

	Mood scales		Trait scales		
	Pleasant- unpleasant	Positive affect	Negative affect	Neurotic-stable	Extravert- introvert
<i>Mood-sensitive tasks</i>					
Probabilities	20***	11*	- 27****	- 17**	07
Word rating	36****	33****	- 34****	- 18***	29****
Person perception	39****	29****	- 42****	- 19***	07
Example choice	20***	18**	- 19****	- 17**	07
<i>Scale statistics</i>					
Mean	28 79	56 58	39 20	- 8 35	- 7 98
Standard deviation	28 53	15 67	15 05	1 76	1 45

Note $N = 193$ to 204

* $p < .05$

** $p < .01$

*** $p < .005$

**** $p < .001$

shows the correlations between tasks and mood broken down by mood-scale-first/mood-scale-second conditions. The hypothesis of interest is whether placement of a task close to the mood scale will enhance the task's correlation with mood. The null hypothesis is therefore that a task will have equal correlations with mood in the sample in which it was close to the mood scale when compared to the sample in which it was far from the mood scale. However, each of the four judgment tasks, without exception, had its highest correlation in the subsample where its placement was closest to the mood scale. As can be seen in Table 6, for instance, the probabilities task had an $r = .25$ correlation with mood when placed near the mood scale and of $r = .13$ when placed far from it. Therefore, the probabilities task had a .12 advantage when placed close to the mood scale, the other tasks had .23, .05, and .13 advantages. These four increases due to close placement were significantly greater than zero, $t(3) = 3.58, p < .025$. Apparently, spacing a given judgment task 15 minutes or more before or after the mood scale can lower the correlation by roughly .1. This means that not only does mood predict judgment to a considerable extent, but that the relationship may be somewhat underestimated because of ongoing mood change. At the same time, of course, because an individual's mood will vary around his or her average mood level, mood's influence on judgment will be consistently different for people with differing mood levels.

It is worth noting that if experimenter demand were contributing to results in this and the previous studies, one would expect the correlations to be higher in the mood-scale-first condition. Subjects in that condition would guess the experimenter's interest in mood from the start. A demand explanation would predict that under such conditions, subjects could potentially comply with the experimental hypothesis over more tasks and in a more extreme and consistent fashion than in the mood-scale-second condition. That is, in the mood-scale-first condition demand-prone subjects could actively match their responses to the judgment-task scales to their mood as they went through the study. There would be no reason for them to drop their correlations as tasks were further away from the mood scale because they presumably would not anticipate how rapidly mood was expected to change. Subjects in the mood-scale-second condition, on the other hand, could at best make an attempt to fit their mood to their retrospective impression of their performance on the prior four judgment-task scales, assuming they were paying attention to differential pleasant-unpleasant responding in the first place. Thus, earlier knowledge of the experimental hypothesis would

Table 6
Correlations Between Judgment Tasks and Mood Scale Broken Down
by Proximity to Mood Scale in Study 2

Judgment tasks	Task order	Mood-scale-first	Mood-scale-second
Probabilities	1	25**	13
Example choice	2	31****	08
Geometry (filler)	3	—	—
Person perception	4	36****	42****
Word ratings	5	30***	43****

Note n for each group = 96 to 102

* $p < .05$

** $p < .01$

*** $p < .005$

**** $p < .001$

make it far easier to fake positive, substantially higher correlation patterns in the mood-scale-first condition. This, however, did not occur. Correlations averaged over the four judgment tasks are nearly identical for the mood-scale-first and -second conditions at $r(101-103) = .27$ and $r(101-103) = .30$, respectively. These correlations provide a strong argument against a demand explanation of the results.

Are the framework domains partially independent of one another? To replicate findings from Study 1, representative variables of each domain outlined in Study 1, plus the additional mood-sensitive task, example choice, were entered into a principal components analysis, to which was applied the same oblimin rotation. The results were remarkably similar to those found earlier (see Table 7). Six factors were again extracted with eigenvalues greater than 1.00. Mood introspection is again spread over the first two factors: calm-negative mood and positive-tired mood. Mood-sensitive judgment is represented by the fifth, mood-sensitive task factor, which loads all four tasks. The metamood experience factors are again sufficiently diverse to have loadings on all factors. And also once again, the two mood-related traits, neuroticism and extraversion, each have their own factors (6 and 3, respectively).

The item-factor correlations shown in the structure matrices for Studies 1 and 2 (Tables 4 and 7) yielded high coefficients of congruence for overlapping variables. The coefficients of congruence were excellent for the first two mood introspection factors, $r(16) = .96$, $.91$, good for the mood-sensitive task factor, $r(16) = .79$, and moderate and excellent, respectively, for the extraversion and neuroticism factors, $r(16) = -.46$,

Table 7
Oblique Rotation of Variables Representing the Four-Domain
Framework of Mood-Cognition Interaction (Structure Matrix) Study 2

Domain	Variable	Factor					
		1	2	3	4	5	6
Mood introspection	Anger	-81	-46			-34	23
	Anxiety	-87	-34			-24	23
	Unhappy	-85	-51			-33	29
	Calm	59	56				-23
	Energetic	38	83				-36
	Tired	-50	-67	23			34
	Happy	48	89			26	
	Love	31	75				-39
Mood-sensitive judgment	Probability	29				72	
	Person perception	47	21		40	31	
	Word ratings	27	32	49		56	-26
	Example choice					71	
Metamood experience	Clarity		20				-84
	Bad mood	-81					
	No mood influence				-89		
	Good mood		74	21			
	No influence			-56	-21	27	
Mood-related traits	Neuroticism	-31				-33	53
	• Extraversion		20	68	-22	20	
Variance explained		32%	9%	8%	6%	6%	6%

Note: Decimal points omitted. Loadings of a magnitude less than .20 are omitted.

91 The factor structure is surprisingly consistent from Studies 1 to 2 despite changes between studies that included the addition of a mood-sensitive task and changes among metamood factors. In both cases, the factor structure is supportive of the partial independence of the framework domains. Each domain, with the exception of the multivariate domain of metamood experience, has one or more factors defined as its own.

General predictors of judgment shift The analysis predicting the judgment-shift composite (unit-weighted scores on the four mood-sensitive judgment tasks) was repeated from Study 1. When the pleasant-unpleasant mood score was entered by itself, the result was highly significant, $R(202) = .36, p < .0001$. The subsequent entry of the five metamood factor scales and neurointroversion raised the correlation to $R(202) = .40$, but perhaps due to the higher initial contribution of mood, the change was not significant, F of change = 1.2, *ns*. In this study, only the contribution of neurointroversion reached significance (predicting a negativistic shift in judgment). Further entry of interaction terms had no significant effect, although there was a weak trend in that direction, F of change = 1.6, $p < .15$. A forced entry multiple regression equation with all the above variables but no pleasant-unpleasant mood-introspection variable and no interaction term led to a multiple $R(202) = .35, p < .0002$, again indicating the partial redundancy between domains.

Cross validation of prediction equations for judgment shift. To further indicate the stability of findings between Studies 1 and 2, the Study 1 regression equation used to predict judgment shift was applied to the data of Study 2. The beta weights from Study 1 were altered where necessary to take into account differences in the metamood experience factor scales (e.g., interchanged scales, deletions, and reversals in direction). The multiple R to predict judgment shift actually rose from $R = .35$ in Study 1 to $R(202) = .38, p < .0001$, in Study 2.

Predictions of the other domains In two other analyses of interest, pleasant-unpleasant mood itself was highly predicted from variables in the three other domains (with the judgment composite, the five metamood factors, and neurointroversion in a forced entry regression, $R[202] = .80, p < .0001$). Similarly, neurointroversion could be highly predicted (with the five metamood factors, the judgment composite, and pleasant-unpleasant mood in a forced-entry regression, $R[202] = .44, p < .0001$). Once again, the large number of metamood factors made discussion of their predictions prohibitive, although again, these too could be moderately predicted by regressions. Thus, each mood-cognition domain appeared moderately to highly predictable on the basis of the other mood-cognition domains, with mood introspection most highly predicted.

DISCUSSION

Study 2 demonstrated that the closer together in time mood-state and judgments are assessed, the stronger will be their intercorrelation. The results generalize from experimentally induced mood to naturally occurring moods: the finding that mood shifts occur quickly. Such shifts are incompatible with demand interpretations of the results, which imply that higher correlations would be obtained when mood is assessed initially because the subject is more aware of the experimental question. In fact, such higher correlations do not occur. Average correlations for the judgment tasks were identical whether mood was assessed first or last. The factor structure found in Study 1 was again found. And highly significant multiple regression predictions of judgment shift could be performed from the mood-introspection domain, as well as from the meta-mood and mood-related trait domains.

GENERAL DISCUSSION

The outset of the present discussion is organized according to the three classes of questions that motivated the research: (a) Which judgments shift with mood, and when do they do so? (b) Are the hypothesized domains of the framework independent of one another? and (c) If there are multiple mood domains, will variables from each domain predict judgment shift? Following these considerations, more general issues will be addressed.

Judgments That Shift With Mood

Central issues in the prediction of judgment shift. The preliminary study of the paper demonstrated that researchers have developed a good sense of mood-sensitive cognitions. Tasks such as advice-giving, probability estimation, and word ratings that had been earlier found to be mood-sensitive (e.g., Mayer & Bremer, 1985; Mayer & Volanath, 1985) were again found to be mood-sensitive, furthermore, two newly created tasks that had been hypothesized to be mood-sensitive, example choice and person perception, were also mood-sensitive.

The pleasant-unpleasant mood dimension is so highly intercorrelated with positive-tired and negative-calm mood dimensions (as well as individual moods) that either this dimension or the individual moods will equivalently predict mood-sensitive judgment shift. The positive-tired

and negative-calm mood dimensions may be closest to the underlying factorial structure. But the pleasant-unpleasant dimension yields equally good prediction, and has the advantage of reducing the number of variables used.

A rather interesting aspect of the data is the lack of support for asymmetric effects in judgments shifts. As noted in the introduction, some researchers in cognition and affect have suggested that mood effects are *asymmetrical*, with positive mood causing more substantial mood-congruent changes in cognition than negative ones (e.g., Blaney, 1986; Isen, 1984, 1985). Recall that this prediction is made because happy people are usually unmotivated to think sad thoughts, whereas sad people may think sad thoughts or think positively to cheer themselves up.

Comparing subjects above the mean in pleasant-unpleasant mood to those below it across the three studies, however, the pleasant-mood subjects showed higher mood-judgment correlations on tasks only about half the time. This is different from the results found with experimentally induced moods (e.g., Isen, 1985; Mayer, Gayle, Meehan, & Haarman, 1988). Thus, one explanation for the difference is that the population of naturally sad individuals may be fundamentally different from the population of effectively coping students who are experimentally induced into sad moods. Perhaps the sadness-initiated mood-repair processes are less prevalent in naturally occurring moods because, after all, the sad subjects have allowed themselves to fall into a sad mood in the first place (that is, have failed to repair their moods). If such repair processes were not operating for such subjects, naturally occurring mood should yield more symmetrical results.

The present three studies go beyond prediction to clarify some of the structural relationships between mood-state and judgment. Study 2 demonstrates that temporal proximity plays a large part in obtaining effects. The results suggested that even a 15-minute separation between judgment task and mood report leads to a reduction in correlational levels between the two by as much as 1—a substantial amount when average individual judgment-mood correlations are in the $r = .15$ to $.30$ range. This result demonstrates that not only experimentally induced mood, but also naturally occurring mood, is constantly changing and must be measured in close proximity to judgment if desired effects are to be obtained.

An examination of the three studies together also indicates the importance of mood range to correlational results in this area. The Study 1

sample lacked the mood range of the preliminary study and Study 2, and as a partial consequence, the judgment-mood correlations in Study 1 were far lower than those in the other studies. It is possible that such sample variation in mood may be partly responsible for unstable results sometimes reported in the area.

Finally, it should be noted that the results are not easily accounted for by demand explanations. The studies were designed to minimize demand by forsaking mood induction procedures for naturally occurring mood (Hasher, Rose, Zacks, Sanft, & Doren, 1985) and by placing mood scales *after* mood-sensitive tasks. In Study 2, both mood-scale-first and mood-scale-second conditions were used. A demand explanation would predict that in the mood-scale-first condition, subjects might have been alerted to the purpose of the study earlier, yet this manipulation did not raise the average mood-judgment correlation levels. A demand explanation seems insufficiently complex to account for the mood-judgment correlations in these studies (cf. Mayer & Bower, 1985).

Relationship Among the Cognitive Domains of Mood

The factorial structure of the variables involved in the cognitive domains of mood is quite interesting and was stable in important respects across two independent samples. To recapitulate the results of Studies 1 and 2, mood introspection shows up across two dimensions: positive-tired and negative-calm mood factors, mood-sensitive tasks show up on their own dimension, as do the mood-related traits neuroticism and extraversion. The multivariate metamood experiences cross almost all the various factors and seem to be a thread that knits up the fabric of mood-cognition interaction.

Because metamood is found across all dimensions, and because it is highly redundant with simple mood introspection but contains more cognitive information, it may be that future research on mood should consider the possibility that measures of metamood experience will in some instances provide more information than measures of mood itself.

Prediction Among Cognitive Domains of the Mood System

In both studies there seemed to be some redundant and some unique variance to each of the domains. Pleasant-unpleasant mood, for instance,

was predictable at the $r = .72$ to $.80$ level from the other three domains, neurointroversion-stabextraversion was predictable at a more moderate level of $r = .44$ to $.53$. Judgment shift could be predicted either by mood alone, or alternatively by metamoods and mood-related traits combined. Either method produced predictions at about the $r = .40$ level. In Study 1, adding metamood and mood-related traits to mood significantly improved prediction. In Study 2, the addition was not significant. Thus, although the domains are partially independent, moderate to good prediction of any one is possible from the others.

Evaluative Dimension of Mood and the Mood-Domain Framework

If mood is manifested across diverse domains, then what is the mood? Is it a single one of the four domains, such as mood introspection, or is it all four domains together? From the perspective of the personality systems approach developed at the outset of this article, mood must be regarded as the sum and interaction of these partially independent domains.

One of the most noticeable qualities of the four-domain system is that all four domains are partially represented across pleasant-unpleasant dimensions, or what has elsewhere been called the evaluative first-dimension of cognition (Mayer, 1986). This evaluative first-dimension is in many ways the most important dimension used in classifying environmental stimuli and is evidenced in everything from Osgood's good-bad semantic differential dimension (Osgood, 1969), to facial expression (Abelson & Sermat, 1962), to personality types (Mayer & Bower, 1986, Study 3), to the effects found here, namely, the pleasant-unpleasant quality which accounts for much of the variance of all four domains. Although not all characteristics of mood can be described in these terms, it seems likely that some important characteristics in the description of a mood will involve the overall level of this evaluative dimension across the four domains. It is also possible that, on some occasions, different levels of evaluation across the four domains might represent an unstable or changing mood.

Thinking about mood in this four-domain way also establishes a method to describe certain clinical phenomena. For instance, depression could be described as occurring when the evaluation is uniformly unpleasant across all domains. Sadness, however, might be distinguishable from depression in having a more pleasant evaluation level in the mood-

sensitive judgment domain. Repression or denial of a mood occurs when the evaluation is unpleasant in all domains except mood introspection. These descriptions were foreshadowed by White (1956) who viewed psychopathology as the poor integration of various psychological domains.

Utility of the Mood-System Domain Framework

The analyses presented here support the utility of the four-domain organization used in the beginning of this article. Variables from each domain are factorially distinct and can be used to obtain significant contributions to the prediction of judgment shift. At the same time, the fourfold framework is flexible enough to permit alternative approaches to the measure of each domain. For instance, the results of mood-state introspection may be represented as rotated or unrotated factors, or as individual moods. For these reasons, it seems appropriate to promote this four-domain organization to the status of a "working framework" at this time.

Relationship to Everyday Behavior

It is clear that both mood and longer-term mood-related traits bring about rather dramatic alterations in cognition, and these changes will have real world effects for the individual. Others (e.g., Rosenhan, Salovey, Karylowski, & Hargis, 1981) have shown the effects of mood on behavior in naturalistic social situations. It is probably the case that the effect of each separate mood is small, in the sense that each life decision is only partly determined by mood. Nonetheless, the effects can accumulate dramatically over a lifetime. Average mood level is one of the most stable and general characteristics a person has, it reaches stability coefficients of $r = .80$ when moods are aggregated over as short a period as 12 days (Epstein & O'Brien, 1985). There are, needless to say, many such 12-day periods over a lifetime. Very recently, Abelson (1986) has given a mathematical demonstration of how very small effects in baseball batting averages can aggregate into highly important effects in baseball. Moods' effect on behavior must certainly also aggregate into highly important effects in life.

SUMMARY AND CONCLUSION

The breadth of the personality perspective employed here incorporates more diverse variables in the study of cognition and affect than has pre-

viously been the case. It has grown out of the recognition that productive dialogue can take place between cognition-and-affect researchers, on the one hand, and personality researchers, on the other (cf. Mayer & Salovey, in press).

A personality systems approach to cognition and affect was developed by presenting an outline describing four cognitive domains of mood. The first domain was mood-state introspection, and consists of accessing relevant physiological and cognitive information, and then representing the combination according to a label for the mood-state. The second domain was mood-sensitive judgment, which consists of judgments that may be logically independent of mood (e.g., estimating the likelihood of nuclear war) but nonetheless that change with mood. The third domain was metamood experiences—mood-related propositions of the sort, “This mood will never end,” or “I am thinking good thoughts to cheer myself up.” The fourth domain was mood-related traits—traits such as neuroticism and extraversion which correlate with mood-state.

Over the present series of studies, the relationships among these four domains of the mood system were examined, with a focus on the relationship between mood-state introspection and mood-sensitive judgments. It was found that mood-state and mood-related traits both correlated with “objective” mood-sensitive judgments. This mood-judgment prediction becomes stronger when time separating the measurement of mood and judgment is brief, when the sample’s mood range is wide, and when metamood experiences are used as contributors to the predictions. These and other results were then related to current issues in cognition, affect, and personality. The framework developed in this article provides a coherent structure in which to describe and catalog the interconnected effects of the various domains of the mood-cognition system.

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