

state and/or trait anxiety was found to be associated with more preoccupation, taking less of an analytic attitude toward the situation, and performance denigration. Generally these results are in agreement with research with adults who are sensitizers or generally trait anxious (Fenz & Epstein, 1965; Houston, 1977; Rios-Garcia & Cook, 1975) and thereby lend construct validity to the measures of cognitive anxiety developed here. Somatic trait and state anxiety were found to be associated with preoccupation, which was contrary to expectations derived from research with adults on somatizers and repressors (Dahlstrom et al., 1972; Fenz & Epstein, 1965). Perhaps the cognitive behaviors manifested by children who exhibit somatic anxiety differ from the cognitive behaviors manifested by adults who manifest somatic anxiety. Further research concerning the cognitive behavior of adults who manifest somatic anxiety, as well as cognitive anxiety, seems warranted.

Reference Notes

1. Holmes, D. S. *Cognitive and somatic components of anxiety*. Unpublished manuscript, University of Kansas, 1982.
2. Fox, J. E., Houston, B. K., & Pittner, M. *Coping strategies of children in a stressful situation*. Unpublished manuscript, University of Kansas, 1979.

References

Dahlstrom, W. G., Welsh, G. S., & Dahlstrom, L. E. *An MMPI handbook, Vol. 1: Clinical interpretation*. Minneapolis: University of Minnesota Press, 1972.

Davidson, R. J., & Schwartz, G. E. The psychobiology of relaxation and related states: A multi-process theory. In D. Mostofsky (Ed.), *Behavior control and modification of physiological activity*. Englewood Cliffs, N.J.: Prentice-Hall, 1976.

Deffenbacher, J. L. Worry and emotionality in test anxiety. In I. G. Sarason (Ed.), *Test anxiety: Theory, research, and applications*. Hillsdale, N.J.: Erlbaum, 1980.

Diener, C. I., & Dweck, C. S. An analysis of learned helplessness: Continuous changes in performance, strategy, and achievement cognitions following failure. *Journal of Personality and Social Psychology*, 1978, 36, 451-462.

Doctor, R. M., & Altman, F. Worry and emotionality as components of test anxiety: Replication and further data. *Psychological Reports*, 1969, 24, 563-568.

Fenz, W. D., & Epstein, S. Manifest anxiety: Unifactorial or multifactorial composition? *Perceptual and Motor Skills*, 1965, 20, 773-780.

Fox, J. E., & Houston, B. K. Efficacy of self-instructional training for reducing children's anxiety in an evaluative

situation. *Behaviour Research and Therapy*, 1981, 19, 509-515.

Fox, J. E., Houston, B. K., & Pittner, M. S. Trait anxiety and children's cognitive behaviors in an evaluative situation. *Cognitive Therapy and Research*, 1983, 7, 149-154.

Hagtvet, K. A. Worry and emotionality components of test anxiety in different sex and age groups of elementary school children. *Psychological Reports*, 1976, 39, 1327-1334.

Houston, B. K. Dispositional anxiety and the effectiveness of cognitive coping strategies in stressful laboratory and classroom situations. In C. D. Spielberger & I. G. Sarason (Eds.), *Stress and anxiety* (Vol. 4). Washington, D.C.: Hemisphere, 1977.

Kirkland, K., & Hollandsworth, J. G., Jr. Effective test taking: Skills acquisition versus anxiety-reduction techniques. *Journal of Consulting and Clinical Psychology*, 1980, 48, 431-439.

Liebert, R. M., & Morris, L. W. Cognitive and emotional components of test anxiety: A distinction and some initial data. *Psychological Reports*, 1967, 20, 975-978.

Meichenbaum, D. *Cognitive-behavior modification: An integrative approach*. New York: Plenum Press, 1977.

Morris, L. W., Brown, N. R., & Halbert, B. L. Effects of symbolic modeling on the arousal of cognitive and affective components of anxiety in preschool children. In C. D. Spielberger & I. G. Sarason (Eds.), *Stress and anxiety* (Vol. 4). Washington, D.C.: Hemisphere, 1977.

Morris, L. W., & Liebert, R. M. Relationship of cognitive and emotional components of test anxiety to psychological arousal and academic performance. *Journal of Consulting and Clinical Psychology*, 1970, 35, 332-337.

Papay, J. P., Costello, R. J., Hedl, J. J., Jr., & Spielberger, C. D. Effects of trait and state anxiety on the performance of elementary school children in traditional and individualized multiage classrooms. *Journal of Educational Psychology*, 1975, 67, 840-846.

Rios-Garcia, L. R., & Cook, P. E. Self-derogation and defense style in college students. *Journal of Personality Assessment*, 1975, 39, 273-281.

Schalling, D., Cronholm, B., & Asberg, M. Components of state and trait anxiety as related to personality and arousal. In L. Levi (Ed.), *Emotions—Their parameters and measurement*. New York: Raven Press, 1975.

Schwartz, G. E., Davidson, R. J., & Goleman, D. J. Pattern of cognitive and somatic processes in the self-regulation of anxiety: Effects of meditation versus exercise. *Psychosomatic Medicine*, 1978, 40, 321-328.

Spielberger, C. D. *State-trait anxiety inventory for children: Preliminary test manual*. Palo Alto, Calif.: Consulting Psychologists Press, 1973.

Spielberger, C. D., Gorsuch, R. L., & Lushene, R. E. *Manual for the state-trait anxiety inventory*. Palo Alto, Calif.: Consulting Psychologists Press, 1970.

Thompson, J. G., Griebstein, M. G., & Kuhlenschmidt, S. L. Effects of EMG biofeedback and relaxation training in the prevention of academic underachievement. *Journal of Counseling Psychology*, 1980, 27, 97-106.

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Emotional Responses to Other Persons in Everyday Life Situations

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Several times a day over a period of 4 weeks, 24 housewives recorded (a) characteristics of their momentary situation (place, activities, other persons present); (b) their mood states; and (c) their subjective explanations of those mood states. In addition to this time-sampling diary the subjects completed the 16PF test twice. The type of social situations and the frequency with which they occurred to the subjects were found to be significantly related to personality measures. Mood states, causal attributions of mood states, actualization, and satisfaction of motives proved to be dependent on characteristics of the person and the environment. The results are discussed in terms of interaction between person and social situation.

When we talk in a naive way of emotions like joy, fear, and despair we know quite well what we mean, and we are convinced that others will understand us. But the psychological concept of emotion is rather elusive. As Strongman (1978) points out in a recent book, there is no agreement at all about which phenomena should be called emotions, let alone about how to explain emotions. So, without going into those conceptual and methodological controversies, I have to say first what my concept of emotion is.

I follow Lersch (1938/1970), who conceived of emotions as a person's primary, immediate evaluation of experience with respect to his or her motives. The quality of emotions depends on the kind of motive involved and on the time perspective, that is, on whether the person responds to present events with joy or distress, or hopes for or is afraid of imagined future events. Within Lersch's theory on the one side emotions are closely linked to cog-

nitions, on the other side to motivation. Whereas emotions are evaluative responses to continuously changing experiences, mood relates to the basic tuning of the person, to a diffuse and global evaluation of the situation, an evaluation that integrates and preserves the emotional experiences of the past. Lersch's classification of emotions matches his classification of motives. In both he relies heavily on language, which in his view points to all the important facets of motivational and emotional experience. If we knew about a person's emotional response to a situation not more than that it was positive or negative, we could infer the specific quality of emotion (e.g., anger, anxiety, shame, excitement, love, pleasure with tasty food or sexual contact) if we were informed on which motive was affected.

Convinced of the central function of emotions in a person's life, I designed about 7 years ago a method by which it should be possible to get valid data on momentary mood states related to a representative sample of a person's situations, that is, the place, the kind of other persons present and the activities being performed at the moment, the causal attributions by the person of the mood states, and finally the motives involved. By referring to the momentary experiences, the method should rely less on memory and should be less affected by an individual's readiness to report emotional experiences of a given quality and intensity. Individual differences in memory and readiness to report may be responsible for the fact that Bradburn and Caplovitz (1965),

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who asked their subjects to remember critical incidents of happiness and unhappiness for the last week, found the frequencies of positive mood states uncorrelated with those of negative states. The method should also allow for reliable estimates of the percentage of time spent in different categories of situations. Data analysis should be possible on the individual and collective levels (Brandstätter, 1977).

Up to now, seven time-sampling studies of emotional responses to everyday life situations have been performed, each comprising about 25 persons, the first with a class of students (Brandstätter, 1981), the second with faculty members (Ott & Brandstätter, Note 1), and the third with housewives (Brandstätter, Fünfgelt, & Barthel, Note 2). Another study was done by Schuler and Fünfgelt (Note 3) with girls and boys in professional training within industry. Recently, data have been collected in a home for the elderly in Austria (Floss, 1982) and in two Italian military units in Northern Italy, one with German-speaking soldiers, the other with soldiers of Italian origin (Kirchler, in press).

Here I will report on some aspects of the study with 24 housewives, especially on their responses to social situations. What can be said about the influence of behavior settings (e.g., living room, shop) and activities (cooking, watching TV, etc.) on mood states, and about how interview data relate to diary measures is reported elsewhere (Brandstätter et al., Note 2). The social characteristics of the sample (age, number of children, income and professional status of husband, etc.) are presented there, too.

I did not start with specific hypotheses derived from an established or fashionable theory. Of course there were some very general preconceptions about the characteristics of the environment and the characteristics of the persons that were supposed to be related to emotional responses. These general assumptions are stated in terms of interaction between person and environment without being derived from a specific interactional theory, a general picture of which has recently been given by Lantermann (1980).

A person's situation results from his or her motives and skills on the one side, and the incentives and barriers (difficulties) presented by the environment on the other side. The

goals a person strives for in a specific situation are jointly determined by his or her motivational dispositions and by the environmental incentives as well as by his or her perceptions of personal competence and environmental difficulties. These cognitions depend on cognitive structures acquired by prior experience. The outcome of goal-directed behavior (success or failure) is influenced mainly by objective characteristics of the person and the environment, that is, by skills and task difficulties. But the emotional evaluation of the outcome is mediated by outcome perception and attribution; objective success and failure is only one factor among others in this process.

In the time-sampling diary (TSD) method, the subjects provide information on the environment, activities performed, and on emotional states for the randomly selected moments of self-observation. The motives relevant to each of the concrete situations observed, as well as the attributions of satisfaction/dissatisfaction, are indicated by the subjects in retrospect by coding of their diary notes, especially of what they have written about their subjective explanations of mood states.

The subject's self-concept is assessed by Cattell's 16 Personality Factor Test (16 PF; Cattell, 1965), which tells us what kind of person he or she thinks he or she is, and what kind of situations he or she prefers. What is missing is an objective measure of a person's skills in pursuing his or her goals under specific environmental conditions. The intelligence score of the 16 PF is too general to be useful in predicting success or failure in specific situations, which are very often social in nature. In fact, many of the 16 PF items express opinions about a person's skills in coping with specific social situations. Of course, only what a person thinks his or her social skills would be, not what his or her abilities really are, is given by the 16 PF. Nevertheless, we may assume that these judgments have some validity. If the personality scales should prove useful in predicting emotional responses to social situations, in part this might be so because in some way they also measure social skills.

Nisbett and Wilson (1977) have raised serious doubts about introspective reports (see also Sabini & Silver, 1981). In general, people would not be aware of those environmental characteristics that influence their behavior,

and even if their reports were correct this would result from plausible hypotheses about how people in general behave in such a situation, and not from introspection. But what these critics of introspection really show is that there are situations in which the subjects can not tell or will not admit to the experimenter what influenced their behavior and not that people usually are unaware of effective motives and incentives, cognitions, and emotions. There are many conspicuous changes in a person's environment, many events that are perceived and interpreted consciously and in a specific way that only the person can tell and will tell if properly asked. As to the validity of the TSD measures, we can expect that increased self awareness (Duval & Wicklund, 1972) induced by this method improves the accuracy of self-reports (cf. Jackson & Paunonen, 1980, p. 525). The strict privacy of records also helps in securing their validity. Even if the subjects give descriptions or explanations not really based on careful introspection but on preestablished hypotheses, these ought not to be commonly shared ones but can be quite characteristic for and effective in his or her personal way of interacting with his or her environment. Of course, since he or she cannot tell what is going on under the surface of consciousness, all introspective information is incomplete, some biased, and some completely wrong in its causal inferences. But how could conscious experience be delusive most of the time if it has developed biogenetically as an adaptive system (Lorenz, 1973)? Whatever weakness this approach may have, one can reasonably expect that it will provide us with some new insight not accessible by more conventional methods.

Method

Subjects

For the study we chose a district of the city of Augsburg, West Germany, that seemed to be rather heterogeneous and typical with respect to the social class of its inhabitants. From the telephone directory we selected 150 addresses at random, as yet not knowing if the selected household met the criteria, that is, that it was one of a married woman not working outside of the home and whose husband had not yet retired. A letter explaining briefly the aims of the study having been sent to the 150 households, two interviewers visited in order to check whether or not the household belonged to the sample we wanted to study and, if so, to gain the housewives cooperation. There were

about 40 households meeting the criteria, and 25 housewives finally participated in the study. The data of one woman had to be excluded from the analysis because they were incomplete.

Diary Format and Questionnaires

At a first meeting the housewives were thoroughly informed of the procedure they should follow: to make notes in a booklet on their momentary experience each day at times randomly selected by the experimenter. The time samples were different for each day and each person. There were seven questions to answer each time: (a) "Is my mood at the moment rather negative, indifferent, or rather positive?" (b) "How can I describe my momentary mood state using one or two adjectives?" (c) "Why do I feel as I have indicated?" (d) "Where am I?" (e) "What am I doing?" (f) "Who else is present?" (g) "To what extent do I feel free to choose to stay in or leave my present activity?" Before leaving the first meeting the subjects answered a German version of Cattell's 16 PF questionnaire (Schneewind, 1977). After a few days' experience with the diary the housewives met again with the experimenters and discussed their problems with the method. The following day they started with the diary, which had to be kept during the 30 days from January 17 to February 15, 1979. During that period they were interviewed by two of the experimenters, a female and a male student, who asked them the questions selected by Pross (1976). At the end of the 4 weeks they answered the 16 PF questionnaire a second time. They also completed a quality-of-life inventory (an adaptation from Campbell, Converse, & Rogers, 1976) and a questionnaire on their attitudes toward the study.

Time Sampling

The schedule for the time sampling, printed on a sheet of paper and handed out to the subjects, had been generated by a computer program by dividing the 24 hours of the day into six segments of 4 hours each and choosing randomly one point of time within each segment. In the booklet a separate page was provided for each of the 180 scheduled observation times (6 per day over 30 days). The time samples were randomly different for each person. The subjects had to watch their schedules in a way that secured quasi randomness without interfering too much with the natural flow of their activities: Whenever it came into mind that time for diary recording might have come subjects had to take their notes immediately if the prescribed time point was no more than half an hour later. In case a scheduled time point had been forgotten, the subjects had been instructed to take their notes just for the moment they became aware of their omission. In situations where they knew it was time for taking notes but were for some reason not able to do so, they had to memorize their answers to the seven questions immediately in order to write them down as soon as possible. They were not allowed to record remembered situations from the past if they had not been explicitly memorized. Since there were also times for recording scheduled during the night, the subjects had to mark the next morning those that were within their hours of sleep. Since subjects slept 8 hours on average, the expected number of records per day was 4, resulting in a total expected number of 120 per person for 30 days. The actual number varied between days and persons owing

to a variation in hours of sleeping and in frequencies of omissions.

Coding the Diary Records

Since we wanted to be sure that the participants trusted our promise that all data would be completely anonymous, and for preserving the personal structuring of experience, the diary notes had to be coded by the participants themselves. The list of categories, a preliminary form of which had been developed in a preceding study, was revised in cooperation with the subjects, who then were trained in using the coding schema.

There were categories for the following aspects of the complex situations: (a) time of note; (b) mood state (negative, indifferent, positive); (c) time perspective (present mood state attributed to a past, present, or future event); (d) sources of satisfaction/dissatisfaction; (e) relevant motives; (f) behavior setting (e.g., living room, shop); (g) activities (e.g., cooking, watching TV); (h) other persons present (husband, children, etc.); (i) perceived freedom; (j) adjectives describing the mood state.

In coding the sources of satisfaction/dissatisfaction or, as we may also call them, the causal attributions (Item d), the subjects, after looking at the specific record, had to answer the questions for each observation time: Who or what, respectively, was the source of my mood state of that moment, or who or what made me feel happy/unhappy? Subjects had a list of sources comprising various classes of persons (self, husband, children, etc.) and objects (work equipment, clothes, mass media, etc.) at hand. The most important source had to be put in first place; sources of minor importance could be added in second or third place.

The list of motives given to the subjects consisted of statements indicating the frustration or satisfaction of specific motives. For each page of their diary, corresponding to one point of time, they had to mark at least one and no more than three. Examples of those statements are as follows:

I feel rather bad because (a) I did not perform well in my work [achievement], (b) my environment was so boring [sentience], (c) I was so lonely [affiliation], etc.

I felt rather good because (a) I was successful in my work [achievement], (b) there were new and exciting experiences [sentience], (c) I was with people I like [affiliation], etc.

The adjectives used for describing the quality of mood and emotions were not coded but were literally transferred from the diary.

Each participant was finally paid DM 300 (about \$170, U.S., at that time). On the average the housewives had spent about 50 hours during 2 months for attending the meetings, taking interviews, keeping their diary records, and coding the data.

Results

Outline

In a first paragraph the results of three ANOVAS (two-way, random model) are reported

with mood scores as dependent on (a) subjects by kind of other persons present; (b) subjects by kind of other persons that are made responsible for the mood (causal attributions of mood to other persons); (c) subjects by affected motives. Then for each motive an ANOVA (one-way) is performed (a) with motive occurrence (motive actualization) as dependent on kind of other persons present and (b) with mood score as dependent on kind of other persons present. Finally the results of several multiple regression analyses are reported, each with four 16 PF second-order factor scores as independent variables. The dependent variables are successively (a) occurrence and mood scores of other persons present, (b) occurrence and mood scores of causal attributions, and (c) occurrence and mood scores of motives.

Measures of Emotional Response

The emotional responses to the continuously varying situations were measured in three different ways. For each point of time of observation the subjects noted in writing whether their present mood state was rather negative, indifferent, or rather positive ("mood score"). At the same time they described their emotional experience by one, two, or sometimes three adjectives. These adjectives were coded on the value dimension as negative, indifferent, or positive, providing a second measure, which was averaged if there was more than one adjective ("adjective value"). During the coding stage of the study, after the end of the 4 weeks of self-observation, the subjects gave a subjective explanation of each of their noted mood scores by pointing to the goals (motives) that were fulfilled or frustrated in the situation. From this a third measure could be derived ("goal satisfaction"). The correlations ($N = 2,692$) of the three measures across all observations are $r = .77$ (mood score, adjective value), $r = .90$ (mood score, goal satisfaction), and $r = .77$ (adjective value, goal satisfaction). The variable mood score differs from the variable goal satisfaction mainly by virtue of the fact that all indifferent scores of the former variable had to be transformed into positive or negative values of the latter one. This explains the high correlation between the two variables. Goal satisfaction has been used as the dependent variable in the analyses, since

its split-half reliability is slightly higher than that of the other two. Where the expression mood state or mood score is used in the report, it is meant as a synonym of goal satisfaction.

Mood as Dependent on Subjects and Kind of Other Persons Present

The categories of "other persons present" are ordered according to intimacy beginning with "no other person present" and ending with "strangers." "Family only" means that the woman is together with the husband and at least one of the children while no others are present. The category "relatives/friends" does not necessarily exclude children and husband. Strangers may be present together with relatives/friends, children, husband, or alone with the subject.

Table 1 shows the relative frequencies and the specific mood scores related to other persons present.¹ A 24×6 ANOVA with subjects (A) and other persons present (B) as factors (random model) gives significant results for both main effects and the interaction effect, $F_A(23, 106) = 3.84, p < .001$; $F_B(5, 106) = 4.60, p < .001$, and $F_{A \times B}(106, 2673) = 1.84, p < .07$. The magnitudes of these effects (Hays, 1973, p. 550) are $\omega_A^2 = .04$, $\omega_B^2 = .01$, and $\omega_{A \times B}^2 = .04$.

Mood as Dependent on Subjects and Causal Attributions to Social Sources

In Table 2 only the first place attributions have been considered. The self is made responsible for the mood state in 14% of the recorded situations, followed by relatives/friends, children, husband, and strangers.

Table 1
Relative Frequencies and Average Mood Scores of Other Persons Present

Other persons present	Relative frequency	Average mood score
No other person	.25	.25
Husband only	.21	.42
Children only	.14	.40
Family only	.15	.51
Relatives/friends	.14	.64
Strangers	.11	.38

Note. $N = 2,808$. The mood score is either -1 or +1.

Table 2
Relative Frequencies and Average Mood Scores of Causal Attributions to Social Sources

Causal attributions	Relative frequency	Average mood score
Self	.14	.16
Husband	.06	.34
Children	.09	.32
Relatives/friends	.11	.52
Strangers	.02	.12
Nonsocial sources	.57	.50

Note. $N = 2,844$. The mood score is either -1 or +1.

When the subjects attribute the cause of their mood state to themselves or to strangers, this mood is quite often negative. Relatives/friends and nonsocial sources are credited primarily for positive emotional experience. The effects of subjects (A), causal attributions (B), and interaction ($A \times B$) are significant: $F_A(23, 106) = 3.66, p < .001$; $F_B(5, 106) = 6.76, p < .001$; $F_{A \times B}(106, 2709) = 2.30, p < .001$. The magnitudes of effects are $\omega_A^2 = .05$, $\omega_B^2 = .02$, $\omega_{A \times B}^2 = .06$.

Mood as Dependent on Subjects and Motives

Table 3 presents the names, not the more concrete statements given to the subjects, of the original list of motives with their relative frequencies. The list of motives had been compiled from similar lists suggested by Murray (1938) and Lersch (1938/1970). Since some motives were scarcely mentioned (cf. Table 3), the 19 motives were grouped intuitively according to their phenomenological similarity into six categories. We may assume that a person will refer to a motive that is important to him or her more often than to a motive that is less important. The relative frequency of a

¹ The data of Table 1 through Table 3 have been analyzed in two ways: by performing ANOVAS (a) with occurrence scores (0, 1) of other persons present, causal attributions, and motives, and scores (-1, +1) of emotional responses and (b) with the arcsin transformations of relative frequencies of other persons present, causal attributions, motives, and positive emotional responses. The results were essentially the same. Therefore only the raw score calculations are reported.

person's motive coding can therefore be taken as a measure of motive importance or motive strength. As Table 3 displays, subjects indicate that the affiliation motive is quite often satisfied, whereas the needs for power and for physical comfort are more often frustrated. The results of ANOVA are for subjects (A), $F_A(23, 115) = 2.27, p < .001$; for motives (B), $F_B(5, 115) = 15.10, p < .001$; for interaction (A \times B), $F_{A \times B}(115, 2684) = 3.50, p < .001$. The magnitude of effects are $\omega_A^2 = .02$, $\omega_B^2 = .09$, $\omega_{A \times B}^2 = .12$.

Relative Frequencies and Mood Scores of Motives as Dependent on Other Persons Present

The question arises as to which motives are activated and to what degree are the various motives satisfied in the presence of different kinds of people. Table 4 gives the answers. For each motive two one-way ANOVAs have been calculated, one for occurrence (motive actualization) and one for satisfaction. All entries, whether on first, second, or third place, have been considered.

The relative frequencies of motives, that is, the frequencies by which the subjects refer to a motive, whether positively or negatively, obviously depend on the kind of other persons present. This is especially true for "physical comfort" and "affiliation," the former being strongly tied to spending time with the husband alone, the latter being especially relevant in the presence of relatives/friends.

As to motive satisfaction, the presence of husband and family is conducive to the satisfaction of the need for physical comfort; the presence of relatives/friends fosters satisfaction of the affiliation motive; satisfaction of the sentience motive is in some way connected with the presence of children, relatives/friends, and strangers. "Higher" motives are positively affected by the presence of husband and family.

Social Emotions, Attribution, and Motivation Predicted by Personality Factors

Previously we have seen that subjects differ in their emotional responses to social situations. Now we will focus on these differences by taking into account personality measures. As Cattell (1965, p. 249) points out, the com-

Table 3
Intuitive Grouping of the Original List of 19 Motives Into Six Categories (Relative Frequencies and Average Mood Scores of Motives)

Motives	Relative frequencies		Average mood score
	Original	Categorized	
Physical comfort	.186	.186	.19
Power		.178	.14
Autonomy	.074		
Prestige	.031		
Power	.024		
Self-esteem	.022		
Self-assertiveness	.018		
Revenge	.009		
Affiliation		.187	.86
Affiliation	.111		
Nurturance	.043		
Love	.029		
Sex	.004		
Sentience		.180	.61
Activity (play)	.103		
Experience (sentience)	.077		
Achievement	.134	.134	.42
"Higher" motives		.109	.31
Order	.036		
Understanding	.017		
Aesthetic values	.030		
Ethical values	.023		
Religious values	.003		

Note. $N = 2,828$. The mood score is either -1 or $+1$.

bined effect of personal and situational characteristics can be represented by multiple regression analysis. For each class of situations a separate multiple regression of average mood scores on personality variables can be computed. The regression equations may differ between situations, indicating that mood states result from an interaction between person and situation.

To compute a multiple regression of situation specific mood scores on 16 personality scales would not be reasonable because of the small sample of subjects ($N = 24$) compared to the large number of predictors ($N = 16$). Four second-order factors were therefore extracted from the 16 PF data of the 24 subjects by a principal component analysis with varimax rotation, representing 71% of the total variance. This still may be questioned, since there are less than twice as many subjects as variables. Besides that, the sample is quite homogeneous, whereas Cattell's second-order

factors seem to be derived as a kind of average from many heterogeneous samples (Cattell & Kline, 1977). This is probably the reason the factors reported here are somewhat different from those of Cattell. They are labeled "spontaneity" (A, F, $-G$, $-Q_3$; outgoing, happy-go-lucky, expedient, casual), and "self-confidence" (C, H, $-N$, $-O$; stable, venturesome, forthright, placid), "irritability" ($-I$, L, Q_4 ; tough-minded, suspicious, tense), "imagination" (M, Q_1 , Q_2 ; imaginative, experimenting, self-sufficient).

For each category of (a) other persons present, (b) causal attributions to other persons, and (c) motives, two multiple regression analyses have been computed—one for the relative frequencies and a second for the specific average mood score as dependent variables.

As can be seen from Table 5, the regression equation for the probability of being alone with the husband is different from that for the probability of being with friends/relatives. Restrained, irritable, and imaginative women are more often alone with the husband; spontaneous women meet friends and relatives more

often. Self-confident women tend to be rather happy alone, with the husband, and with friends/relatives; restrained and imaginative women tend to respond positively to situations where they are alone with the children.

We can see from Table 6 that the relative frequencies of causal attributions to self, husband, and strangers and the mood states related to attributions to self, relatives/friends, and nonsocial sources can partly be predicted from personality factors. The proportion of variance explained, corrected for shrinkage, is up to 32%. There are significant differences in regression equations between categories of attributions. Restrained and imaginative subjects often attribute the causes of mood state to the self and also to strangers; irritable and imaginative subjects often perceive the husband as the cause of their emotional states. Restrained and self-confident women attribute to the self and to relatives/friends predominantly positive mood states.

The analysis of regression of motive importance, that is, relative coding frequency of motive, on the 16 PF second-order factors (Ta-

Table 4
Relative Frequencies (a) and Average Mood Scores (b) of Motives as Dependent on Other Persons Present

Motive	Other persons present						F
	Alone	Husband only	Children only	Family only	Relatives/friends	Strangers	
Physical comfort							
a	.21	.32	.16	.25	.09	.13	20.18**
b	-.02	.13	.02	.10	.06	-.04	5.95**
Power							
a	.21	.21	.24	.19	.17	.26	2.25*
b	.08	.06	.01	.04	.06	.06	2.47*
Affiliation							
a	.13	.21	.24	.25	.49	.24	32.287**
b	.06	.18	.21	.23	.48	.22	43.20**
Sentience							
a	.25	.16	.22	.16	.23	.25	3.02*
b	.11	.08	.18	.12	.19	.19	5.37**
Achievement							
a	.19	.13	.14	.11	.13	.14	1.84
b	.09	.05	.06	.04	.05	.03	1.57*
"Higher" motives							
a	.19	.22	.18	.23	.15	.17	2.10*
b	.04	.12	.05	.11	.03	.06	2.37*

Note. $N = 2,785$. Mood scores: $-1, 0, +1$; a score of 0 is given if the motive is not mentioned at all in the moment of observation.

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

Table 5
Relative Frequencies (a) of and Emotional Responses (b) to Social Situations (Other Persons Present) as Predicted by 16 PF (Second Order; Standardized Partial Regression Coefficients)

Predictors	Alone	Husband only	Children only	Family only	Relatives/friends	Strangers
Spontaneous (A, F, -G, -Q ₃)						
a	-.13	-.32*	-.03	-.13	.36*	.06
b	-.25	-.11	-.55**	-.40	-.40*	.05
Self-confident (C, H, -N, -O)						
a	-.04	-.22	.17	-.03	.17	-.07
b	.40*	.48**	.13	-.06	.41**	.30
Irritable (-I, L, Q ₄)						
a	-.07	.36*	.06	.08	.05	-.12
b	.04	-.22	.21	-.06	-.12	.02
Imaginative (M, Q ₁ , Q ₂)						
a	.38	.33*	-.27	.07	-.21	.01
b	.13	.07	.46**	.15	.17	-.19
Adjusted R ²						
a	.00	.32	.00	.00	.08	.00
b	.01	.13	.28	.00	.14	.00

Note. N = 24. The letters in parentheses indicate Cattell's first order personality factors (16 PF) from which the second order factors are derived.

* $p < .10$. ** $p < .05$.

ble 7) gives significant results for the motives "power," "affiliation," and "achievement." The power motive is important to reserved, self-confident, and irritable women; the affiliation motive is prominent with self-confident and

irritable women. Achievement motivation is negatively related to self-confidence.

Self-confident women tend to feel physically comfortable; reserved and imaginative women enjoy satisfaction of their power motive; self-

Table 6
Relative Frequencies (a) and Emotional Responses (b) Related to Causal Attributions as Predicted by 16PF (Second Order; Standardized Partial Regression Coefficients)

Predictors	Self	Husband	Children	Relatives/friends	Strangers	Nonsocial
Spontaneous (A, F, -G, -Q ₃)						
a	-.30	.04	.13	-.15	-.37*	.11
b	-.42*	.09	.01	-.44**	.09	-.17
Self-Confident (C, H, -N, -O)						
a	-.07	-.21	.09	-.05	.21	.25
b	.33	.10	-.13	.53**	.03	.52*
Irritable (-I, L, Q ₄)						
a	.10	.40**	-.05	-.01	.08	.32
b	.04	-.15	.21	-.08	.17	-.04
Imaginative (M, Q ₁ , Q ₂)						
a	.48**	.47**	-.26	-.03	.42*	-.09
b	.15	.30	.02	.19	-.41*	-.29
Adjusted R ²						
a	.21	.32	.00	.00	.17	.02
b	.06	.00	.00	.27	.04	.21

Note. N = 24. The letters in parentheses indicate Cattell's first order personality factors (16 PF) from which the second order factors are derived.

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

Table 7
Relative Frequencies (a) and Emotional Responses (b) Related to Motives as Predicted by 16 PF (Second Order; Standardized Partial Regression Coefficients)

Predictors	Physical comfort	Power	Affiliation	Sentience	Achievement	"Higher" motives
Spontaneous (A, F, -G, -Q ₃)						
a	-.17	-.39*	-.13	.03	-.04	-.09
b	.10	-.44**	-.16	-.10	-.20	-.59**
Self-confident (C, H, -N, -O)						
a	-.08	.43*	.38*	.08	-.38*	.21
b	.44*	.19	.12	.28	.32	.30
Irritable (-I, L, Q ₄)						
a	-.25	.51*	.40*	.27	.26	.27
b	-.13	-.10	-.37*	.07	-.07	.12
Imaginative (M, Q ₁ , Q ₂)						
a	.19	.13	.02	.32	-.19	.28
b	.02	.42**	-.09	.12	.42**	.05
Adjusted R ₂						
a	.00	.40	.13	.01	.12	.02
b	.09	.24	.00	.00	.14	.21

Note. N = 24. The letters in parentheses indicate Cattell's first order personality factors (16 PF) from which the second order factors are derived.

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

confident and imaginative women are proud of their achievements, and reserved women experience fulfillment of "higher" motives.

Discussion

The main question examined in this study is emotional responses to other persons in everyday life situations. We have looked at this in three different ways: by relating mood states (a) to objective characteristics of the social environment, that is, the social roles of other persons present; (b) to social attributions of mood states; (c) to motives activated in social situations. The discussion deals with these points one by one.

Mood Related to Other Persons Present

Social roles of other persons present may be conceived rather as causes than as effects, of mood states. In fact, many situations cannot be avoided, and when there is a choice, they are approached or avoided not so much according to the present mood state but according to the expected satisfaction, which, of course, is perceived as a possible amelioration or deterioration of the present state. As yet the TSD is not quite suitable as a basis for separating the different causal chains con-

necting mood with other persons present, or both with a third variable.² Some of the TSD data (not presented here) reveal that perceived freedom of choice to enter or to leave the situation is closely related to mood (Brandstätter et al., Note 2). In future studies it may be worthwhile to have the subjects give an account of mood states preceding recorded situations. We may then find pleasure of anticipation in freely chosen situations and apprehension in situations the subject could not avoid.

Being alone is significantly less rewarding than being with others, especially with relatives/friends (Table 1). This points to a problem resulting from the role of a housewife, who on the average spends a quarter of her time alone. What the women miss when they are alone is not only the company of others (affiliation) but also a stimulating and activating environment (sentience), as Table 5 shows.

It cannot reasonably be assumed that the person present would affect the mood state independently of other situational character-

² Time series analyses have evidenced that mood states at time t predict mood states at time $t + 1$ to a certain degree, but do not predict the kind of other persons present at time $t + 1$ (Brandstätter, Note 4).

istics. Cross-tabulating two categories of activities (work/leisure) with the kind of other persons present (not shown here) reveals an interaction between "activities" and "other persons present." Whereas the contrast work or leisure makes no difference in the case of being alone, it matters if others are present. So the husband's presence seems to be rather annoying if the wife has to work while he relaxes. Generally speaking, objective characteristics of situations are apparently perceived and interpreted as complex configurations and not as a weighted average of single dimensions (cf. Argyle, Furnham, & Graham, 1981; p. 31).

It is not surprising that the 24 subjects respond to the different roles of other persons present in an individually different way, as the Situation \times Subject interaction shows. Such an interaction was also found in a study with a class of students (Brandstätter, 1981).

The differences between subjects in emotional response to social situations can be explained further by relating them to personality measures (Table 5). Looking first at the regression of the relative frequency of the social situation "husband only" on personality factors, the results appear plausible. They hold even if the age of the women and the number of children is partialled out; restrained (reserved, sober, conscientious, controlled), irritable (tough-minded, suspicious, tense), and imaginative (imaginative, experimenting, self-sufficient) women spend more time alone with the husband than women with the opposite characteristics. Spontaneous (outgoing, expedient, casual) women have closer ties to friends and relatives. Looking at mood as dependent variable, we find self-confidence (stable, venturesome, forthright, placid) to foster positive mood states in situations alone, with husband only, and with friends/relatives. Alone with their children, restrained and imaginative women feel better. Is it because they are better able to handle their problems with children?

Mood Related to Causal Attributions

The statistical interaction between subjects and other persons present seems to be less conspicuous than that between subjects and causal attributions. Subjects differ not only in relative frequencies of specific attributions but

also in mood states related to these attributions. Some mention the husband mainly as a source of positive emotions and children as a source of rather negative ones, and others perceive it the other way around. Average mood states attributed to self, husband, children, relatives/friends, and strangers are scarcely correlated across subjects. Subjects differ less in their pattern of emotional states related to other persons present than they differ in their pattern of emotional states related to the kind of people they make responsible for their mood state. On the one hand, this could mean that attributions can be perceived as being in part a result of prior rewarding or frustrating experience with other persons and as being the cause of further rewarding or frustrating social interaction. On the other hand, one has to consider that the mere presence of other persons is neither a necessary nor a sufficient condition for causal attributions. Of course, there are significant positive correlations between presence/absence of other persons and causal attributions to these other persons, as a more detailed data analysis not presented here reveals. But we may reasonably assume that causal attributions of mood to other persons are tied to remembered, actually experienced, or anticipated specific social interactions with others, and not simply to their presence. Therefore we could get further insight into the attribution process by relating motives separately for each subject not only to kind of other persons present but also to causal attributions.

Mood Related to Motives

Motives differ greatly in the degree of satisfaction (Table 4). Relatively often the subjects feel powerless and physically uncomfortable. In the case of physical comfort we may generally assume that deprivation extends over a longer period of time than satisfaction, which soon leads to a state of indifference by satiation or adaptation. The frustration of the power motive could be specific to the situation of a housewife, who may see herself in a disadvantaged position, dependent on the husband's income, and uncertain of her social status.

Cattell (1965) developed his system of dynamic traits (or motives) separately from his temperament traits, that is, personality factors, without elaborating the relations between

them. However, comparing the psychological meaning of the personality factors with that of motivational factors, one would intuitively expect that there are correlations between the two domains. So it is not surprising that the strength of the power motive, and to a lesser degree the strength of the motives affiliation and achievement, can be predicted from the 16 PF questionnaire in a plausible way. Which motives tend to be satisfied and which not depends not only on specific abilities but also on temperament traits to a certain degree, as temperament traits are shaped according to quality and intensity of motive satisfaction. A person has to be in some way restrained (A-, F-, G, Q₃, i.e., reserved, sober, conscientious, and controlled), in order to get satisfaction from striving for "higher" goals, that is, order, understanding, aesthetic, ethical, or religious values. On the other side, rewarding experiences reinforce those behavior styles that were conducive to this kind of satisfaction.

Qualities of Emotions

It may appear questionable to look at emotional responses only as positive-negative, neglecting their multidimensionality (Traxel & Heide, 1961; Wundt, 1910) or their discrete variety (Izard & Buechler, 1980). Indeed, we would give away too much valuable information from the diary records if we did not try to differentiate further. By relating motives to mood states we did just that. If a woman tells us "I am in a rather negative mood state because I expect (time perspective: future) the others will not respect me as I want," we would guess that the emotion is less likely to be sadness, anger, disgust, contempt, or guilt than fear or shame/shyness. The adjectives by which the subjects described their mood states give some further information on the complex qualities of emotions. In a total sample of 2,852 recorded situations almost 600 different adjectives were used. Smallest space analyses are underway in order to arrive at a comprehensive descriptive system of emotions based on actual word usage in randomly sampled life situations. Existing adjective checklists (Ekman, 1957; Hecheltjen & Mertesdorf, 1973; Janke & Debus, 1978; Kristof, 1964; Nowlis, 1970) are based either on semantic similarity judgments or on judgments of experimentally provoked mood states.

Proportions of Variance Explained

Calculation of proportions of variances explained by subjects, situations, and interactions may be questioned for several reasons. First, those percentages are heavily dependent on the categorizing of situations; using many narrowly defined categories would result in a higher percentage of explained variance than using only a few broadly defined categories comprised of rather heterogeneous situations. Second, the proportion of variance explained is drastically increased if the analysis is based on a person's average mood score for each type of situation. Taking an odd-even partition of a person's observations within each category of social situations (i.e., other persons present), and calculating for each half sample of observation a person's average mood score leads to 10% variance explained by social situations and 22% explained by subjects. If the observations had been extended over 2 months instead of 1 in order to arrive at more reliable odd-even scores for each person and situational category, the error variance would have been still lower, leading to higher percentages of explained variance. Obviously, predictability largely depends on the level of aggregation (cf. Epstein, 1980). In addition, variance of emotional responses to specific situations during a prior time period may be useful in predicting emotional responses to these situations at a later time period. Therefore, combining 16 PF measures with information on past emotional responses may also increase the predictability.

Interaction Between Personality and Social Environment

Personality measures proved to be differential predictors for the subject's emotional responses to specific social situations. Most studies on the interaction between person and environment dealt with a person's perception and evaluation of verbally described situations or with retrospective reports on previously experienced situations (cf. Argyle et al., 1981). The TSD tries to overcome these restrictions and to go beyond a mere demonstration of a Person \times Environment interaction by explaining which personality characteristics are relevant for what kind of social situations. Unfortunately, by making data collection time

consuming, this technique limits the number of subjects.

Personality characteristics are not only determinants of people's reactions to given social situations but also of people's activities in approaching or avoiding specific social situations. Some of the results presented here fit well with those reported by Argyle et al. (1981, p. 103) for an inventory containing a personality questionnaire, a list of activities, and a list of social situations. However, correlations between different parts of an inventory, that is, between personality measures on the one hand and reported frequencies or preferences of activities and social situations on the other, could be the result of common method variance from asking the same question with different words. Only if the occurrence of and responses to real social situations in a person's life are related to personality measures in a theoretically meaningful way can the analysis of interaction between person and environment be appropriately undertaken. In future studies, self-observation should be complemented by unobtrusive external observation. Techniques of observation focusing on meaningful units of goal directed behavior (Newtson, 1976; see also Cranach, Kalbermatten, Indermühle, & Gugler, 1980) have to be adjusted to allow for matching with self-reports.

Final Comment

Emotional responses are a joint function of a person's goals and skills on the one side and of characteristics of the environment facilitating or impeding a person's striving for goals on the other side. This very general statement says nothing about the different levels of trans-situational and transpersonal generality and of temporal stability of conditions. There is a hierarchy of goals in the sense that the more stable higher order goals to which the concept of motive may be related become concrete and effective, but also less stable, through specific incentives given by the environment. The environment itself is hierarchically ordered in the sense that there are supraordinate structural components that determine the characteristics of the environment on the lower hierarchical levels.

When we register the kind of situations a person encounters and how often, what his or

her emotional responses and attributions are, and so on, we get valuable insight into a person's proximal situation. But without taking into account the broader social context of a person's life the psychological descriptions and explanations of a person's goal orientations and emotional responses to life events are highly restricted in generality. Here it becomes evident that a thorough scrutiny of a person's emotional responses to social-life events needs to be related to research on personality structure and personality development on the one hand, and to research on social structure and social change on the other hand.

Reference Notes

1. Ott, H., & Brandstätter, H. *Zeitstichproben des Befindens*. Unpublished manuscript, University of Linz, 1979.
2. Brandstätter, H., Fünfgelt, V., & Barthel, W. *Twenty-four hours during thirty days in the life of twenty-four housewives*. Paper presented at the Fifth Colloquium on Economic Psychology, Leuven and Brussels, August 1980.
3. Schuler, H., & Fünfgelt, V. *Arbeitsbericht des Projekts "Befinden in Alltagssituationen"*. Unpublished manuscript, University of Erlangen, 1981.
4. Brandstätter, H. *Multivariate time series analysis of goal orientations, emotional states and their causal attributions in everyday life situations*. Paper presented at the East/West Meeting of the European Association of Experimental Social Psychology, Varna, Bulgaria, May 1983.

References

- Argyle, M., Furnham, A., & Graham, J. A. *Social situations*. Cambridge, England: Cambridge University Press, 1981.
- Bradburn, N. M., & Caplovitz, D. *Reports on happiness*. Chicago: Aldine, 1965.
- Brandstätter, H. *Wohlbefinden und Unbehagen*. In W. H. Tack (Ed.), *Bericht über den 30. Kongress der DGfPS in Regensburg, 1976*. Göttingen: Hogrefe, 1977.
- Brandstätter, H. *Time sampling of subjective well-being*. In H. Hartmann, W. Molt, & P. Stringer (Eds.), *Advances in economic psychology*. Heidelberg: Meyn, 1981.
- Campbell, A., Converse, P. E., & Rogers, W. L. *The quality of American life*. New York: Russell Sage Foundation, 1976.
- Cattell, R. B. *The scientific analysis of personality*. Harmondsworth, England: Penguin, 1965.
- Cattell, R. B., & Kline, P. *The scientific analysis of personality and motivation*. London, England: Academic Press, 1977.
- Cranach, v.M., Kalbermatten, U., Indermühle, K., & Gugler, B. *Zielgerichtetes Handeln*. Bern: Huber, 1980.
- Duval, S., & Wicklund, R. A. *A theory of objective self-awareness*. New York: Academic Press, 1972.
- Ekman, G. Dimensions of emotion. *Acta Psychologica*, 1957, 11, 279-288.

- Epstein, S. The stability of behavior. Some implications for psychological research. *American Psychologist*, 1980, 35, 790-806.
- Floss, F. *Soziale Ungleichheit im Alter*. Linz, Austria: Universitätschriften, 1982.
- Hays, W. L. *Statistics for the social sciences* (2nd ed.) New York: Holt, Rinehart & Winston, 1973.
- Hecheltjen, K. G., & Mertesdorf, F. Entwicklung eines mehrdimensionalen Stimmungsfragebogens (MSF). *Gruppendynamik*, 1973, 4, 110-122.
- Izard, C. E., & Buechler, S. Aspects of consciousness and personality in terms of differential emotions theory. In R. Plutchik & H. Kellerman. *Emotion: Theory, research, and experience*. New York: Academic Press, 1980.
- Jackson, D. N., & Paunonen, S. V. Personality structure and assessment. *Annual Review of Psychology*, 1980, 31, 503-551.
- Janke, W., & Debus, G. *Die Eigenschaftswörterliste (EWL)*. Göttingen, West Germany: Hogrefe, 1978.
- Kirchler, E. Befinden von Wehrpflichtigen in Abhängigkeit von personellen und situativen Gegebenheiten. *Zeitschrift für Arbeits- und Organisationspsychologie*, in press.
- Kristof, W. Eine empirische Untersuchung zur Klassifikation der Gefühle. *Psychologische Forschung*, 1964, 28, 46-63.
- Lantermann, E. D. *Interaktionen*. Person, Situation und Handlung. Munich: Urban & Schwarzenberg, 1980.
- Lersch, Ph. *Aufbau der Person*. Munich: Barth, 1970. (1st ed., 1938)
- Lorenz, K. *Die Rückseite des Spiegels: Versuch einer Na-*

- turgeschichte menschlichen Erkennens*. Munich: Piper, 1973.
- Murray, H. A. *Explorations in personality*. New York: Oxford, 1938.
- Newtson, D. Foundations of attribution: The perceptions of ongoing behavior. In J. J. Harvey, W. Ickes, & W. Kidd (Eds.), *New directions in attribution research*. Hillsdale, N.J.: Erlbaum, 1976.
- Nisbett, R. E., & Wilson, T. D. Telling more than we know: Verbal reports on mental processes. *Psychological Review*, 1977, 84, 231-259.
- Nowlis, U. Mood: Behavior and experience. In M. B. Arnold (Ed.), *Feeling and emotions*. New York: Academic Press, 1970.
- Pross, H. *Die Wirklichkeit der Hausfrau*. Reinbeck, Rowohlt, 1976.
- Sabini, J., & Silver, M. Introspection and causal accounts. *Journal of Personality and Social Psychology*, 1981, 40, 171-179.
- Schneewind, K. A. Entwicklung einer deutschsprachigen Version des 16 PF Tests von Cattell. *Diagnostica*, 1977, 23, 188-191.
- Strongman, K. T. *The psychology of emotion*. Chichester, England: Wiley, 1978.
- Traxel, W., & Heide, H. J. Dimensionen der Gefühle. *Psychologische Forschung*, 1961, 26, 179-204.
- Wundt, W. *Grundriss der Psychologie* (6th ed.), Leipzig: Engelmann, 1910.

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