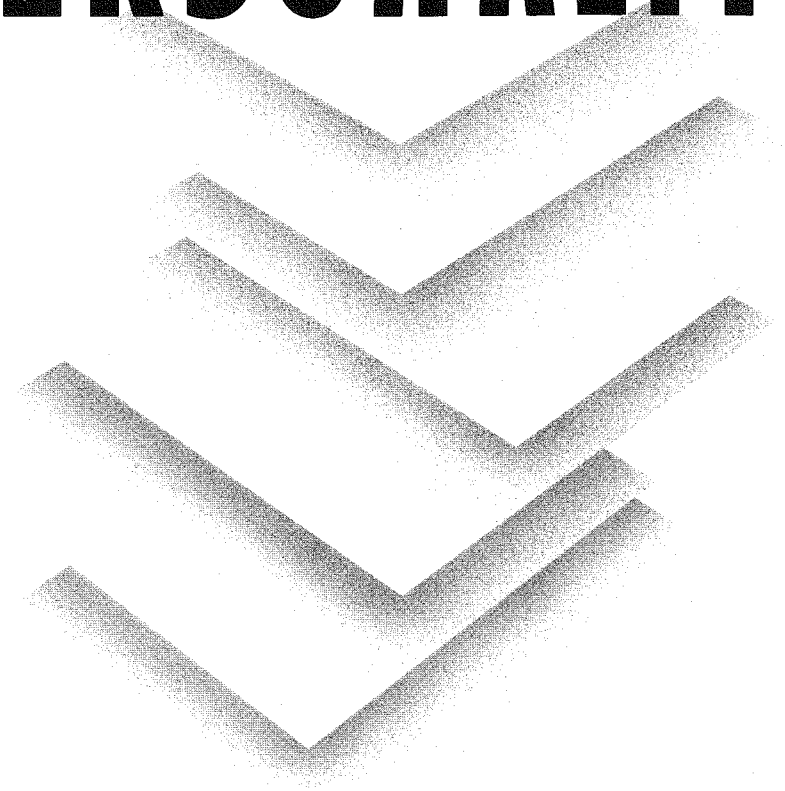


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Well-being and motivational person-environment fit: a time-sampling study of emotions

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Abstract

The report is based on the data of seven studies (altogether 188 persons varying in gender, age, and education level) with the author's time-sampling diary, by which the subjects record their momentary mood, the behaviour setting, other persons present, activities, causal attributions of experienced emotions, and affected motives about four times a day for a period of 30 days. For each pattern of four 16PF second-order factors (median split), the relative frequencies of references to six classes of motives (i.e. the personal motive profiles) and for each of 16 behaviour settings, the relative frequencies by which each of those motives was satisfied in the whole sample of persons (environmental motive profiles) were derived from the diary data. The degree of motivational person-environment fit (P-E fit; correlation of personal and environmental motive profiles) was calculated for each combination of personality structure and behaviour setting. As predicted, a person's well-being in a behaviour setting clearly depends on the motivational P-E fit which explains the intra-individual variance of well-being (across situations) and the intra-situational variance (across persons) in addition to the variance explained by emotional stability and extraversion.

INTRODUCTION

This study aims at analysing the internal (personal) and external (environmental) conditions of emotional responses to everyday life situations, based on seven different studies with the author's time-sampling diary (TSD) of subjective experience in everyday life situations (Brandstätter, 1977, 1983).

Following Murray (1938, p. 118f.), Jahoda (1961), Pervin (1976), Holland (1959, 1985), French (1978), and Hoefert (1982), to mention only a few scholars interested in person-environment fit (P-E fit), it is assumed that for feeling good, people's motives (goals) must correspond to the gratifications provided by their environment. This statement could be criticized as a truism, not worthy of empirical testing, because

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it looks more like a generally accepted definition of well-being than like an empirically testable hypothesis about the conditions of well-being. Yet, this would be true only if individual well-being and the general reward potential of a situation were reported by the same person. In such a case, the relationship between well-being and motivational P-E fit would indeed be mainly semantic in nature. However, the motive structure of a person and the reward potential of the environment are not only conceptually, but also empirically separable conditions of happiness. Although common sense tells us that well-being follows from motive satisfaction, this does not mean that we cannot learn more about motivational P-E fit as a condition of happiness by systematic research. Up to now, to the author's knowledge, this problem has never been studied by time sampling of subjective experience, a technique which allows one to analyse in a quite unique way how people's well-being varies with their everyday life situations of being alone or with others (family members, relatives, friends, acquaintances, authority figures, or strangers), of leisure and work, and of staying at home or outside the home.

There are different ways of categorizing or measuring environments (for a recent review, see Forgas and Van Heck, 1992). Mapping the characteristics of persons and the characteristics of the environment on the same dimensions has the great advantage that the degree of P-E fit can easily be assessed. Murray (1938) provides an example of such an approach by relating personal 'need' to environmental 'press'. Another example is given by Holland (1959, 1985), who suggests as one method among several others using the average preferences (orientations) of people living in a specific school or occupational setting for characterizing those settings. A person's preference profile can then be compared with the profile of the specific environment. Without reference to Holland's work extended over some decades from the early 1950s onwards, Bem and Funder (1978) suggested a very similar approach called the 'template matching technique' using the same Q-sort (Block, 1961) of statements for characterizing the person and the environment, the latter in terms of a fictitious person that would be optimally fit for behaving in a certain way in this kind of environment (e.g. being a successful or happy worker in a specific organization).

As yet, the motivational P-E fit hypothesis of subjective well-being in natural settings has been tested in rather global terms only, i.e. for whole organizations or positions within an organization (cf. Bergmann and Eder, 1992; French, 1978; Holland, 1985). The TSD approach chosen here allows any differentiation of situations that one wants to study for theoretical or practical reasons. There is another novel aspect in the study: the motives are not measured via questionnaires or interest inventories, but by relative frequencies by which a subject attributes feeling good or bad to satisfaction or frustration of the motive. This is an (ipsative) operant measure rather than a respondent measure of motive strength (McClelland, 1980).

The TSD data of personal experience in everyday life situations provide a good opportunity for relating a person's motive structure, i.e. the *intra-individual* relative frequencies of motive actualization (as indicators of motive importance) to the motive structure of situations, i.e. the *collective* relative frequencies of motive satisfaction in the whole sample of subjects (as indicators of the probability that a specific motive will be satisfied when actualized in a specific situation). Differences in correspondence between the *individual motive importance* profile and the *situational motive satisfaction* profile should allow intra-individual variation of happiness across situations and intra-situational variation of happiness across persons to be predicted. Happiness

will be measured by a person's relative frequency of feeling good in the specific type of situation.

Classifying situations or, using a concept of Barker (1968), behaviour settings is a psychological task which has attracted much attention in recent years (Argyle, Furnham and Graham, 1981; Brandstätter, 1991; Cantor, Mischel and Schwartz, 1982; Eckes and Six, 1984; Forgas, 1982; Frederiksen, 1972; Hoefert, 1982; King and Sorrentino, 1983; Magnusson, 1980; Nascimento-Schulze, 1981; Van Heck, 1984, 1989; Wakenhut, 1978). Phenomenological ('intuitive') classifications compete with classifications based on some kind of multidimensional scaling or statistical clustering (cf. Eckes and Six, 1984, p. 11).

For the present analysis a classification had to be chosen which is general enough to be applicable to such different groups as students, housewives, and soldiers. It also had to be as objective as possible within the diary approach, not at all or only negligibly confounded with idiosyncratic perceptual or emotional responses of the subjects. The number of situations to be considered had to be large enough to render the correlations across situations between motivational P-E fit and subjective well-being sufficiently reliable. Finally, the behaviour settings should differ remarkably in their potential to satisfy the various categories of motives. All these prerequisites are given by a classification of behaviour settings according to (a) the social distance of other persons present (1 = alone; 2 = partner; 3 = children; 4 = relatives; 5 = friends; 6 = acquaintances; 7 = authority figures; 8 = strangers); (b) restraint of activities (leisure, work); and (c) unfamiliarity of the place (at home, outside the home). Social situations were classified according to the average social distance score of the classes of people present in the situation into three categories corresponding mainly to 'family members only'; 'relatives and friends, irrespective of who else is present, or family members together with acquaintances, authority figures, or strangers'; and 'acquaintances, authority figures, or strangers mainly'.

The subjects were classified with respect to their pattern of four 16PF second-order factor scores: Norm Orientation, Emotional Stability, Independence, and Extraversion (Schneewind, Schröder and Cattell, 1983).¹ These four dimensions are highly similar to four of the Big Five personality dimensions on which the search for a comprehensive system of personality dimension seems to converge (Borkenau and Ostendorf, 1991; McCrae and Costa, 1985; Noller, Law and Comrey, 1987): Conscientiousness, Emotional Stability, Agreeableness, and Extraversion. There is no equivalent for intelligence (culture or openness) among the 16PF second-order factors.

A median split in each dimension separately performed for female and male subjects results in $2 \times 2 \times 2 \times 2 = 16$ categories, each category comprising highly similar personality structures and together representing all combinations of the most important personality dimensions.

Using the 16PF (Cattell, Eber and Tatsuoka, 1970) as a personality measure and classifying the subjects into 16 categories according to their pattern of 16PF second-order factor scores needs some justification. In 1977, when the TSD was applied for the first time to a class of students of socio-economics, the 16PF was the most comprehensive and internationally the most widely used personality questionnaire for which an authorized German translation was available. For securing comparability

¹ Cattell, Eber and Tatsuoka (1970) label these dimensions 'conscientiousness', 'anxiety', 'independence', and 'extraversion'.

lity, all the later TSD studies had to use the 16PF questionnaire. Of course, the hypothesis on motivational P-E correspondence as a condition of well-being could have been tested without referring to personality measures, simply by correlating the motive profile of each individual subject with the motive satisfaction profile of each class of situations. However, linking motive structure as assessed by the TSD technique to personality structure has the advantages (a) that more reliable motive profiles for people characterized by the same *pattern* of 16PF second-order factor scores can be estimated than for individual subjects, and (b) that one can estimate how much motivational P-E fit contributes to the predictability of well-being in addition to the contribution of personality factors.

Hypotheses

The central hypothesis to be tested here refers to the construct of motivational P-E fit as a condition of well-being in everyday life situations. It is assumed that motivational P-E fit contributes to the intra- and inter-individual variance of mood in addition to the variance explained by emotional stability and extraversion, the most powerful predictors of well-being among the basic personality dimensions (Costa and McCrae, 1980; Emmons and Diener, 1985; McLennan, Gotts and Omodei, 1988; Watson and Clark, 1984), and in addition to the variance explained by characteristics of the environment.

The subjects' self-reports on emotional stability are a kind of summary of their past negative or positive emotional experience indicating the correspondence of the subjects' desires with the rewards (frustrations) provided by the subjects' environment in the past. The contribution of extraversion to well-being is probably most effective in unfamiliar social situations, because extraversion is characterized by interest in social contacts as well as by the social skills necessary for enjoying the company of others. We can assume that usually the personal and environmental characteristics in which desires and rewards are rooted are rather stable. Therefore, we can predict that if somebody was often unhappy or happy in the past, in a similar environment his/her present or future emotional experience will also be predominantly negative or positive.

Predicting emotional experience from self-reports on emotional stability is rather trivial. Empirical evidence for such a prediction clearly supports the validity of personality scales, but does not contribute much to the theoretical understanding of the origin of negative or positive affectivity as a personality trait.

Less trivial is the hypothesis that subjective well-being comes from motivational P-E fit. Correlations between self-reports on emotional stability and self-reports on subjective well-being represent not much more than semantic relationships between abstract general statements and statistical aggregates of a number of concrete experiences—although the abstract statements and the concrete self-observations refer to different time segments. However, if we can show that motivational P-E fit as measured in the present study correlates with 'feeling good', we come closer to a causal explanation of intra- and inter-individual mood variations in daily life. The crucial point is that the subjects are not asked about their motive structure or about the reward potential of the various settings of their environment. Motive structure and reward potential are constructed by the experimenter from a larger

number of observations recorded by the individual (motive structure) and all other subjects (reward potential).

METHOD

Subjects

Altogether 188 subjects participated in seven different studies: (a) a class of 25 students of social economics (Brandstätter, 1981); (b) 18 faculty members (including doctoral students) of a psychology department (Brandstätter and Ott, 1979); (c) 24 housewives (Brandstätter, 1983); (d) 27 soldiers of the Italian army (Kirchler, 1984); (e) 28 unemployed men and women (Kirchler, 1985); (f) 24 members of a charity organization (Auinger, 1987); and (g) 21 men and 21 women participating as couples (Kirchler, 1984). Thirty-seven per cent of the subjects were women. The age of the subjects varied from 18 to 60 years with a median of 28 years. Around 50 per cent had a lower level of education (less than 13 years; most of them 4 years primary, 4 years intermediary school, and 3 years apprenticeship); 40 per cent finished secondary school with maturity (the majority of this group participated in the study as students); and 10 per cent had a university degree. Four groups (students, faculty members, soldiers, and volunteers) were willing to participate as complete organizational units. The housewives constituted a random sample drawn from the telephone directory of a typical district of Augsburg. The unemployed were contacted at the unemployment registration office (Arbeitsamt) of Linz. The couples were recruited by announcements on the blackboard at the University of Salzburg and via personal acquaintanceship. Four groups (students, housewives, soldiers, and unemployed persons) were paid for their participation (between DM 100 and DM 300).

Diary format and questionnaire²

Except for minor modifications and some variations in the additional questionnaires, the procedure was virtually the same in all studies.

At the first meeting, the subjects were thoroughly informed of the procedure that they should follow: the subjects had to make notes in a booklet on their momentary experience about four times a day during a period of 30 days. The random time samples were different for each day and for 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?'; and (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 16PF questionnaire (Schneewind *et al.*, 1983). After a few days' experience with the diary, the participants 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 consecutive 30 days. Only the unemployed subjects had a different time schedule.

² The description of the diary and time-sampling format follows closely Brandstätter (1983, p. 873).

They took notes at four periods of 10 days each; in the first, second, and third month after job loss, and a final period in the fourth, fifth, or sixth month after job loss. At the end of the recording time span, the subjects answered the 16PF questionnaire a second time and in addition 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 h of the day into six segments of 4 h 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). Since subjects slept 8 h on average, the expected number of records per day was 4, resulting in a total expected number of 120 per person over 30 days. The actual number varied between days and persons owing to a variation in hours of sleeping and in frequencies of omissions. Whenever it came into mind that the 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. If a scheduled time point had been forgotten, the subjects had been instructed to take their notes just for the moment that they became aware of their omission. In situations in which they knew it was time to take notes but for some reason were 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.

Coding the diary records

In order to ensure that the participants trusted our promise that all data would be completely anonymous, and in order to preserve the personal structuring of experience, the diary notes had to be coded by the participants themselves. The list of categories was designed or, if a prior study provided suitable categories, revised in cooperation with the subjects, who then were trained in using the coding schema.

There were categories for the following aspects of 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) behaviour setting (e.g. living room, shop); (g) activities (e.g. cooking, watching TV); (h) other persons present (husband, children, etc.); (i) perceived freedom; and (j) adjectives describing the mood state.

In coding the sources of satisfaction/dissatisfaction or, as we may also call them, the 'causal attributions'; (category d), the subjects, after looking at the specific record, had to answer the following questions for each observation time: Who or what, respectively, was the source of my mood state at that particular moment, and 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 19 motives given to the subjects followed to some extent Lersch (1938/1970) and Murray (1938). It 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 felt 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. See Table 1 for the list of motives used by the subjects. The 19 motives were classified into six broader categories by the author according to the semantic similarities of their description. The categories are Sentience/Activity, Achievement, Physical Comfort, Affiliation, Power, and Higher Motives.

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

RESULTS

Correspondence analysis of motives by situations with relative frequency of motive satisfaction as a dependent variable

Speaking of motivational P-E fit presupposes differences between situations in their motive satisfaction profiles and differences between persons in their motive actualization profiles. Whether the situations actually differ in their potential of gratifying various classes of motives has been checked by a correspondence analysis (Greenacre, 1984) relating the six classes of motives to 16 classes of situations with respect to the relative frequencies across persons by which a motive was satisfied if actualized in a specific situation. Figure 1 shows a two-dimensional solution of the correspondence analysis explaining 76 per cent of the variance.

The first dimension differentiates leisure situations (left) from *work* situations (right); the second is a kind of *social distance* dimension. It separates situations with close relationships (family members, relatives, and friends) from situations characterized by social distance (alone or with socially more distant persons; i.e. acquaintances, authority figures, and strangers). Interestingly, being alone is the opposite of being with family members or relatives/friends and has some similarity to social situations, where close relationships are missing. The third dimension (cf. Table 1) goes with the distinction between 'at home vs. out of home'. Thus, the correspondence analysis shows that the *a priori* classification of situations is psychologically meaningful.

If actualized, the needs for physical comfort, power, and higher motives are most frequently satisfied during leisure. The advantage of leisure is less pronounced for the satisfaction of the needs for achievement, affiliation, and activity. The presence of family members, relatives, or friends is good for satisfying the needs for power, physical comfort, affiliation, and activity. Need for achievement and higher motives are less dependent on close social contacts (Figure 1).

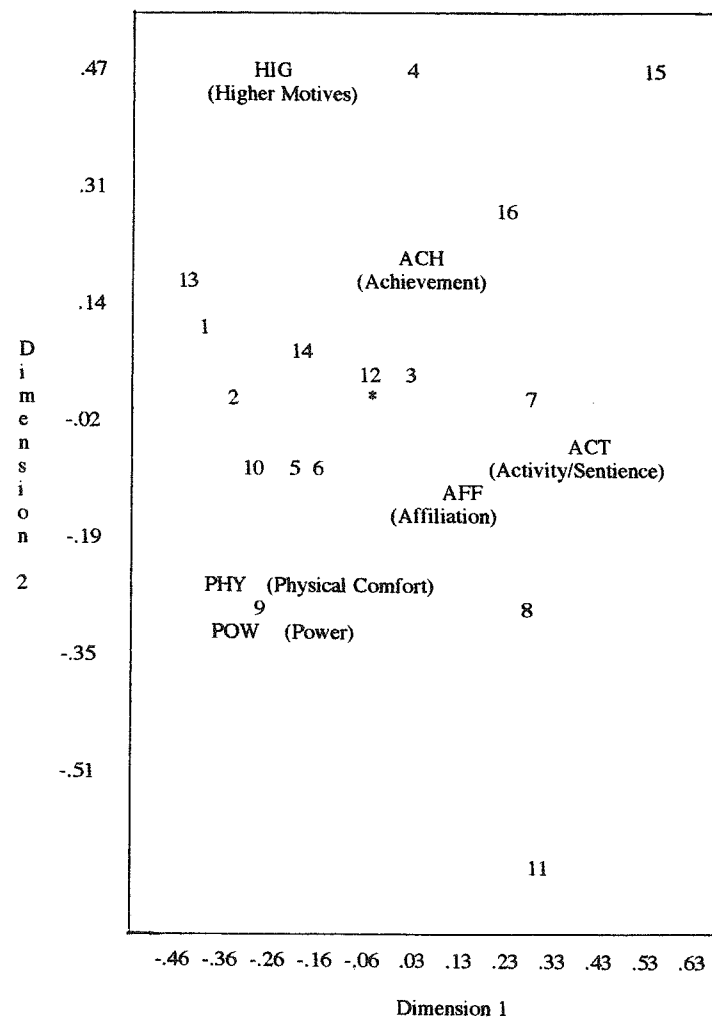


Figure 1. Correspondence analysis of the reward potential of 16 situations for six classes of motives. The numbers (1–16) represent the situations (see Table 1)

Calculation of the motivational P–E fit

To explain the steps undertaken in testing the hypothesis on motivational P–E correspondence, we look at Table 2. Matrix A contains the motive actualization ratios (relative frequencies of motive actualization across situations) for each type of person, whereas matrix B visualizes the motive satisfaction profiles (relative frequencies of motive satisfaction under the condition of motive actualization across persons) for each category of situations. By correlating each motive actualization profile of persons (each column of matrix A) with each motive satisfaction profile of situations (each column of matrix B), we arrive at matrix C with elements indicating the motivational P–E fit (motPEF) for each type of person and each type of situation. Matrix D has as elements the Happiness scores (relative frequencies of feeling good) for 16 types of persons in 16 classes of situations. Correlating each row of matrix C with

Table 1. Values of situations (1–16) and motives on the first three dimensions of the correspondence analysis

Situations			Dimensions		
			I	II	III
1. Alone	Leisure	Home	–0.40	0.12	–0.58
2. Alone	Leisure	Out	–0.35	0.02	–0.02
3. Alone	Work	Home	0.12	0.05	–0.31
4. Alone	Work	Out	0.05	0.46	0.02
5. Family	Leisure	Home	–0.18	–0.10	0.06
6. Family	Leisure	Out	–0.13	–0.08	0.02
7. Family	Work	Home	0.40	0.01	0.17
8. Family	Work	Out	0.42	–0.27	–0.14
9. Friends	Leisure	Home	–0.26	–0.30	–0.02
10. Friends	Leisure	Out	–0.28	–0.09	0.13
11. Friends	Work	Home	0.46	–0.64	–0.08
12. Friends	Work	Out	0.01	0.05	0.50
13. Acquaintances	Leisure	Home	–0.46	0.18	0.02
14. Acquaintances	Leisure	Out	–0.18	0.07	0.17
15. Acquaintances	Work	Home	0.66	0.46	–0.21
16. Acquaintances	Work	Out	0.35	0.27	0.22
Motives					
Activity/Sentience			0.54	–0.06	–0.23
Achievement			0.11	0.21	–0.15
Physical Comfort			–0.38	–0.25	0.04
Affiliation			0.22	–0.12	0.38
Power			–0.36	–0.31	–0.23
Higher Motives			–0.29	0.47	0.06

Note: Acquaintances include strangers.

the corresponding row of matrix D, and each column of matrix C with the corresponding column of matrix D, results in the vectors *E* and *F* containing the correlations between motivational P–E fit and well-being across situations and across persons (see Table 2).

ANOVA with mood as a dependent variable

In order to test the combined effects on well-being of personal and situational characteristics together with the effects of motivational P–E fit, an analysis of variance was performed with Emotional Stability (low–high), Extraversion (low–high), Alone–With Others, Leisure–Work, and At Home–Out of Home as independent variables (factors); motivational P–E fit as a covariate; and the satisfaction ratio (relative frequency of positive mood) as a dependent variable. For 16 types of persons (all 24 combinations of the four dichotomized personality dimensions: Norm Orientation, Emotional Stability, Independence, and Extraversion) and 16 classes of situations (four Social situations crossed with Leisure/Work and At Home/Out of Home), we get 256 aggregates of observations derived from about 19 000 observations of 188 persons. As mentioned before, individuals had to be grouped into 16 classes with respect to their personality structure (patterns of the four dichotomized personality dimensions) in order to arrive at a high enough number of observations in the 16

Table 2. Data processing for testing the P-E fit hypothesis

Matrix A: Motive actualization profiles of persons

		Personality structures															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
M o t i v e	1	21	15	18	26	14	14	20	19	21	16	17	17	16	18	21	14
	2	17	15	09	14	14	17	10	12	16	12	11	15	16	11	11	10
	3	18	20	21	16	25	15	17	21	17	20	16	21	24	17	24	16
	4	19	16	21	21	16	18	13	21	19	18	20	20	17	24	20	26
	5	16	24	21	14	21	26	28	20	16	22	24	18	17	19	14	20
	6	10	10	10	09	10	11	12	09	11	13	12	09	11	11	11	13

Matrix B: Motive satisfaction profiles of situations

		Situations															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
M o t i v e	1	56	42	68	51	66	77	75	77	63	62	84	54	50	59	85	62
	2	64	76	64	59	72	63	64	73	77	74	62	63	72	70	86	58
	3	62	62	49	39	76	76	51	54	82	80	56	63	71	65	42	33
	4	50	74	69	64	91	92	90	86	92	95	96	89	78	91	80	83
	5	57	56	50	36	61	63	39	47	69	65	57	36	61	58	29	40
	6	68	61	59	62	73	81	57	43	66	78	37	61	83	76	60	60

Table 2. *Cont.*

Matrix C: Motivational person-environment fit

		Situations															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
P e r s o n a l i t y	1	-71	-21	28	-27	08	03	40	71	28	-11	81	12	-68	-21	29	07
	2	-39	-11	-64	-86	-29	-43	-51	-18	19	-21	08	-44	-41	-47	-68	-61
	3	-72	-29	-34	-62	09	21	-03	09	32	07	45	-05	-39	-15	-47	-22
	4	-78	-38	53	-01	17	35	64	77	15	-06	90	24	-63	-04	46	37
	5	-24	00	-70	-80	-01	-18	-43	-19	40	06	02	-16	-17	-30	-67	-66
	6	-51	06	-30	-52	-28	-46	-32	-01	14	-20	21	-40	-34	-25	-44	-22
	7	-37	-62	-51	-81	-63	-38	-52	-32	-36	-58	02	-73	-67	-66	-65	-49
	8	-80	-24	-16	-55	14	18	12	33	40	07	62	04	-48	-14	-25	-14
	9	-80	-30	38	-17	15	22	53	74	25	-06	88	20	-66	-11	34	22
	10	-54	-24	-58	-74	-04	04	-31	-18	26	03	19	-21	-29	-23	-71	-42
	11	-74	-31	-26	-54	-13	02	-12	01	10	-11	39	-27	-43	-18	-49	-10
	12	-67	05	-19	-52	21	02	09	39	58	16	58	13	-36	-10	-19	-21
	13	-25	04	-47	-64	12	-11	-18	08	48	11	19	03	-23	-25	-35	54
	14	-95	-04	11	-18	40	45	39	47	53	34	77	30	-24	25	-08	27
	15	-53	-27	-05	-34	32	42	29	36	39	20	54	29	-33	-04	-03	-10
	16	-82	15	05	-01	54	57	35	29	59	55	57	40	11	49	-18	36

Table 2. *Cont.*
Matrix D: Subjective well-being of persons in situations

	Situations																E	cor
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
1	46	46	40	58	67	77	63	67	60	69	58	61	67	63	(75)	44	10	
2	48	63	56	24	63	86	50	50	86	66	79	38	(67)	55	67	35	66	
3	61	48	49	42	77	70	67	86	74	69	60	45	75	61	55	56	49	
4	65	69	60	30	88	99	85	(67)	66	85	58	49	(99)	83	—	65	04	
5	58	63	67	63	60	78	50	(50)	70	77	80	78	(99)	67	—	40	50	
6	77	73	59	40	88	77	50	50	92	89	80	60	(99)	67	(99)	72	37	
7	59	49	63	54	69	66	42	53	89	74	64	52	60	66	40	37	24	
8	70	70	79	59	82	91	71	67	75	88	77	55	90	75	80	55	14	
9	54	56	59	62	81	77	68	73	76	78	71	65	67	72	(99)	59	40	
10	60	55	65	56	68	74	64	38	80	72	78	63	99	64	83	47	24	
11	39	62	65	55	73	67	62	60	81	76	69	50	46	61	33	55	74	
12	52	48	54	43	79	86	50	83	72	82	78	64	(00)	76	—	55	63	
13	61	85	50	47	69	74	64	89	95	79	69	68	(50)	64	(00)	50	52	
14	73	41	65	48	79	79	62	99	97	85	76	60	78	71	50	69	39	
15	71	75	70	60	85	88	69	77	91	84	(67)	63	—	82	(99)	78	50	
16	59	62	67	53	85	80	60	60	79	80	80	52	67	79	80	60	44	
F	cor	-06	-10	05	46	34	73	55	-07	32	-36	23	21	59	10	51		

Note: The decimal points have been omitted. In matrix D, the figures in parentheses are based on cell frequencies less than 5. On the average, the relative cell frequencies (mood ratios) of matrix D are based on 75 observations. For labels of situations see Table 1. The personality types are combinations of Norm Orientation, Emotional Stability, Independence, and Extraversion (median split; 1 1 1 all low = type 1; 1 1 2, 1 1 2 1, 1 1 2 2, etc. to 2 2 2 2 all high = type 16).

Table 3. Analysis of variance with the mood ratio as a dependent variable and motivational P-E fit as a covariate

	F(1,221)	p
Main effects		
Emotional Stability (ES)	16.31	0.00
Extraversion (EX)	6.33	0.01
Social Situation (SOC)	60.24	0.00
Leisure vs. Work (LEIWORK)	71.29	0.00
Home vs. Out (HOMEOUT)	7.43	0.01
Covariate		
P-E Fit	35.24	0.00
Interactions		
ES × EX	0.73	0.39
ES × SOC	3.33	0.07
ES × LEIWORK	0.00	0.98
ES × HOMEOUT	0.01	0.91
EX × SOC	1.91	0.17
EX × LEIWORK	2.04	0.16
EX × HOMEOUT	8.04	0.01
SOC × LEIWORK	8.11	0.01
SOC × HOMEOUT	1.24	0.27
LEIWORK × HOMEOUT	1.74	0.19

Table 4. Means of the mood ratios depending on Emotional Stability, Extraversion, Social Situation, Leisure-Work, and Home-Out

Main effects	Interaction effects	
Emotional Stability	Home	
Low	Introverts	64
High	Extroverts	72
Extraversion	Out	
Low	Introverts	65
High	Extroverts	65
Social Situation	Leisure	
Alone	Alone	60
With others	With others	76
Leisure-Work	Work	
Leisure	Alone	55
Work	With others	62
Home-out		
Home		68
Out		65

Note: Only significant ($p < 0.05$) main effects and interaction effects are presented. The decimal points have been omitted.

classes of situations necessary for calculating the entries in a 16×16 (16 personality structures and 16 situations) matrix of mood ratios.

Table 3 presents the ANOVA and Table 4 the means of the mood ratios.

Emotional stability (ES) is a strong predictor of mood with $F(1,221) = 16.31$ and $p < 0.001$. Extraversion shows a main effect [$F(1,221) = 6.33$; $p = 0.01$] and an interaction effect with Home/Out [$F(1,221) = 8.04$; $p = 0.01$], which means that only extraverts (and not introverts) feel better at home than outside the home. At first glance, this may seem surprising. A closer look at the three-way interaction Introversion/Extraversion by Leisure/Work by Home/Out [$F(1,10) = 3.13$, $p = 0.078$; not shown in Table 4] tells us, however, that extraverts feel better at home than outside the home only when working (0.68 vs. 0.55), but not during leisure time (0.76 vs. 0.74). The respective means for introverts are 0.60 vs. 0.60 and 0.68 vs. 0.69.

All three situational characteristics have highly significant F values in their main effects: to be alone is less pleasant than to be with others (0.58 vs. 0.69); leisure is more agreeable than work (0.72 vs. 0.60); in general, people feel slightly better at home than outside the home (0.68 vs. 0.65). The interaction between Alone/With Others and Leisure/Work means that the difference between leisure and work in well-being is larger in social situations than when no other person is present.

Most important, the regression of motivational P-E fit on mood ratios is highly significant with $F(1,221) = 35.24$ and $p < 0.001$. The covariate motivational P-E fit was added to the ANOVA after the main effects. Therefore, we can say that motivational P-E fit contributes a great deal to the variance of mood even if the main effects of personality variables and of environmental characteristics are partialled out.

A multivariate analysis of variance (MANOVA) with repeated measures in combinations of the three within-subjects factors (Alone/With Others, Leisure/Work, and Home/Out) gives essentially the same results. The between-subjects regression of the mood ratios (averaged across situations) on the P-E fit indices (averaged across situations) is again highly significant with $F(1,11) = 9.99$ and $p = 0.009$. The main effects of Emotional Stability and Extraversion are characterized by $F(1,11) = 8.81$ and $p = 0.013$, and by $F(1,11) = 1.59$, $p = 0.234$, respectively. For the within-subjects contrasts of Alone/With Others, Leisure/Work, and at Home/Out, we find $F(1,11) = 3.94$, $p = 0.073$; $F(1,11) = 85.40$, $p < 0.001$; and $F(1,11) = 5.25$, $p = 0.043$. The significant within-subjects interaction terms are Emotional Stability by Alone/With Others $F(1,11) = 5.97$, $p = 0.033$; and Extraversion by Home/Out $F(1,11) = 6.19$, $p = 0.043$. There are no significant higher-order interactions. For the MANOVA, the 18 out of 256 missing values of the mood ratios (all cells with less than five observations for calculating the mood ratio were counted as missing) had been replaced by the average mood ratio of 0.66.

Applying ANOVA to the repeated-measures design may be objected because of the within-subjects dependence of measures. Nevertheless, it was preferred here because the regression of the dependent variable (mood ratio) on the covariate (P-E fit) uses all observations across personality structures and situations, whereas MANOVA provides estimates for averaged measures only (averaged across situations). The correlation between mood ratio and motivational P-E fit (averaged across situations) is $r(16) = 0.58$. The correlation between the two variables, calculated for all 256 cells (18 missing), is $r(238) = 0.41$. Partialling out the effects of Emotional Stability and Extraversion does not change the correlation. Partialling out the effects of situations reduces the correlation somewhat to $r(238) = 0.36$.

One may ask whether personality factors have an incremental validity in predicting

Table 5. Means, standard deviations, and correlations of the general mood ratio and the situation-specific mood ratios with Emotional Stability (ES) and Extraversion (EX)

Variable	Mean	SD	Correlations with		Situations		
			ES	EX			
GMR	66.50	5.50	0.52*	0.31	All (unweighted mean)		
SMR1	59.56	10.30	0.65**	0.34	Alone	Leisure	Home
SMR2	60.31	12.20	0.38	-0.02	Alone	Leisure	Out
SMR3	60.50	9.36	0.50	0.29	Alone	Work	Home
SMR4	49.63	11.38	0.31	-0.50*	Alone	Work	Out
SMR5	75.81	8.97	0.15	0.37	Family	Leisure	Home
SMR6	79.38	9.02	-0.03	0.54*	Family	Leisure	Out
SMR7	61.06	10.63	-0.25	0.04	Family	Work	Home
SMR8	68.07	17.59	0.16	-0.24	Family	Work	Out
SMR9	80.19	10.75	0.56*	0.07	Friends	Leisure	Home
SMR10	78.31	7.01	0.54*	0.38	Friends	Leisure	Out
SMR11	71.80	8.33	0.39	0.52*	Friends	Work	Home
SMR12	57.69	9.82	0.35	-0.27	Friends	Work	Out
SMR13	72.22	16.00	0.09	0.68*	Acquaintances	Leisure	Home
SMR14	69.13	8.12	0.29	0.27	Acquaintances	Leisure	Out
SMR15	61.00	19.36	0.08	0.78*	Acquaintances	Work	Home
SMR16	54.81	12.42	0.23	0.20	Acquaintances	Work	Out
ES	0.00	1.03					
EX	0.00	1.03					

Note: Friends mean relatives and friends; acquaintances include strangers. GMR = General mood ratio; SMR1 to SMR16 = situation-specific mood ratios. Mood ratios are given as percentages.

* $p < 0.05$; ** $p < 0.01$ (two-tailed tested).

satisfaction ratios in addition to the P-E fit index. It has incremental validity indeed. However, this incremental validity rests completely on the general (not situation-specific) relationship between the personality dimension and subjective well-being. If one controls for a person's general satisfaction ratio, the personality factors lose their predictive power, whereas the motivational P-E fit is still a valid predictor of mood variation unique to specific situations. Whilst the correlation (general mood ratio partialled out) is close to zero for Emotional Stability and Extraversion, it is $r(235) = 0.34$ for motivational P-E fit.

By the way, the correlations between Emotional Stability and Extraversion with the general mood ratio are $r(16) = 0.52$ and 0.31 , whereas the median correlations of Emotional Stability and Extraversion with the situation-specific mood ratios are $r(16) = 0.29$ (min -0.25 , max 0.65) and 0.30 (min -0.50 , max 0.78) with clear evidence of differential validity of Emotional Stability and Extraversion in predicting well-being in various situations. As one can see from Table 5, emotional stability is irrelevant for well-being in social situations with family members and less important with acquaintances/strangers, but highly influential when the subjects are alone or with relatives/friends. Extraverts feel particularly bad when working alone out of home, and they feel good during leisure time with friends outside the home. In social situations with acquaintances and strangers at home, extraverts are better off than introverts.

DISCUSSION

The motivational P-E fit hypothesis is clearly supported by the data. The subjective well-being of persons across various behaviour settings of their daily life depends to a remarkable degree on the correspondence between the motive actualization profile of the person and the general motive satisfaction profile of the behaviour setting.

One should remember here that the two types of profile are logically and technically independent; that means, the correlations are not measurement artefacts, but mirror an important empirical relationship, this notwithstanding the fact that both, the personal and the environmental motive profiles, rest altogether on exactly the same data set. The crucial argument here is not that for any combination of person and behaviour setting the profiles rest on only marginally overlapping data: on the average, the overlap is no more than 6 per cent. More important and really essential is the fact that the person profiles relate to motive actualization across settings (irrespective of whether the motive has been frustrated or satisfied), whereas the setting profiles relate to motive satisfaction (provided by the setting across persons). For example, if a person refers to the affiliation motive 20 times out of 100 observations (relative frequency of motive actualization is 20 per cent), the individual satisfaction ratio of the affiliation motive could vary between 0.00 (the motive is always frustrated) and 1.00 (the motive is always satisfied).

Empirically, there can be a positive correlation between individual motive actualization profiles and individual motive satisfaction profiles. Such a correlation can be expected as far as the persons have freedom to approach or avoid those behaviour settings which promise or threaten, respectively, to satisfy or frustrate their most important motives (cf. Emmons, Diener and Larsen, 1986). However, the correlations between individual motive actualization profiles and individual motive satisfaction profiles are, on the average, as low as $r = 0.05$. This could mean that the freedom in approaching satisfying and avoiding frustrating circumstances is rather restricted. Another explanation is equally plausible: although people have some freedom and efficiency in pursuing the satisfaction of their most important motives, frustration of less important motives may increase their importance by sensitization therefore frustrated motives may become gradually more important. Thus, we would have two opposing tendencies leading together to a close to zero correlation between individual motive importance and motive satisfaction.

To make completely sure that partial data overlap cannot be the reason for the positive correlations between the P-E fit measures and measures of subjective well-being, the correspondence between personal motive actualization profiles and environmental motive satisfaction profiles (i.e. motivational P-E fit) could have been calculated by eliminating from the respective environmental profile the approximately 6 per cent of the data that belonged to the people whose motive actualization profile was under consideration. Because of the high reliabilities (odd-even) of the environmental motive satisfaction profiles, this did not seem to be necessary. Correlating the motive actualization profiles of the odd-numbered subjects with the motive satisfaction profiles derived from the data of the even-numbered subjects would have given virtually the same results.

The correlations between P-E fit and subjective well-being are somewhat higher within personality structures (across behaviour settings) than within behaviour set-

tings (across personality structures). This seems to be so because the variance of the P-E fit measure as well as that of the mood ratio is generally higher across settings than across personality structures.

Emotional stability and, to a lesser degree, extraversion predict general well-being in line with a number of other studies where these basic dimensions have been related to mood. The influence of emotional stability and extraversion on well-being varies with the situations in a meaningful way. Why in particular extraverts (and not so much introverts) feel much better out of home during leisure than during work has been analysed in another study and explained by referring to the stronger social motives and to the higher social skills of extraverts (Brandstätter, in press).

The correspondence between individual motive structure and environmental reward structure proved to be a strong determinant of subjective well-being. It should now be possible to predict a person's subjective well-being in a specific behaviour setting if one knows his/her motive structure. However, assessing the personal motive structure via the TSD is time-consuming and costly. Whether common methods (projective techniques or questionnaires) for measuring motive strength are valid predictors of the TSD-motive importance profiles remains to be shown in future research. Obviously, TSD-motive importance would be a valuable criterion for the validity of any motivation test.

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