
Facets of Affective Experiences: A Framework for Investigations of Trait Affect

Ulrich Schimmack

Shigehiro Oishi

Ed Diener

Eunkook Suh

University of Illinois, Urbana-Champaign

Research on the relation between personality and affect is concerned with the nature of affect dispositions. The authors propose that the general notion of trait affect is too broad and propose a more refined framework that differentiates facets of affect-related traits. Each facet is a combination of a type (e.g., mood, emotion), an aspect (e.g., frequency, intensity, duration), and a quality (e.g., pleasure, displeasure) of affective experiences. Previous research on the relation between pleasant trait affect and unpleasant trait affect has yielded inconsistent results. In the present article, the authors demonstrate that these inconsistencies are resolved once the theoretical distinctions between facets are recognized. In particular, they show that the facets "frequency of pleasant emotions" and "frequency of unpleasant emotions" are positively correlated. In contrast, the amount of time that people are in a pleasant mood is negatively correlated with the amount of time that people are in an unpleasant mood.

Affective experiences are by definition states that change from moment to moment. They are influenced by situational factors such as a kiss from one's partner, hearing a good joke, a change in the weather, or catching the flu (see, e.g., Ekman & Davidson, 1994; Frijda, 1986; Lazarus, 1991; Lewis & Haviland, 1993; Thayer, 1989). However, affective experiences are also determined by dispositions within individuals. It is a major goal of personality research on affect to distinguish variance due to traits from variance due to environmental factors (Pervin, 1993; Wakefield, 1989).

Personality psychologists have taken two major approaches to study affect-related traits. One approach measures momentary affective experiences repeatedly (Diener & Larsen, 1984; Epstein, 1983; Schimmack & Diener, 1997). By means of aggregation or latent-state-

trait analysis (Eid, 1995; Steyer, Ferring, & Schmitt, 1992), one can reduce or eliminate situational variance and measure affect-related traits (e.g., an individual is most of the time in a good mood).

Alternatively, researchers can directly ask participants to report affect-related traits (Diener, Smith, & Fujita, 1995; Izard, Libero, Putnam, & Haynes, 1993; McCrae & Costa, 1997; Watson & Clark, 1992). For example, an item could be, "I am often in a good mood," and a respondent can indicate to which degree the item characterizes his or her personality. This approach, however, makes the assumption that people can accurately aggregate momentary feelings in their minds (see Parkinson, Briner, Reynolds, & Totterdell, 1995; Reizenzein & Schimmack, 1999; Schimmack & Reizenzein, 1997; Thomas & Diener, 1990, for related evidence).

Key questions in research on traits in general, and on affect-related traits in particular, concern the number and nature of affect dispositions (Larsen, 1989). This question typically has been addressed by correlating measures of different trait affects. A common finding is that measures of the same hedonic valence (e.g., affection and happiness, anxiety and anger) are positively correlated. Another common finding has been that trait measures of opposite valence (e.g., happiness and anger) are unrelated. This pattern of results has led to the view that affective experiences are influenced by two

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orthogonal dispositions: one disposition that influences how much pleasant affect one experiences and another that influences how much unpleasant affect one experiences (Costa & McCrae, 1980; Emmons & Diener, 1986; Larsen & Diener, 1992; Meyer & Shack, 1989; Watson & Clark, 1992).¹

We suggest that it is useful to differentiate the global traits of "amount of pleasant affect" and "amount of unpleasant affect." For example, Schimmack and Diener (1997) showed that averages of momentary affect ratings consist of two separable traits, namely, the typical frequency and the typical intensity of affective experiences. Second, self-report studies of trait affect often have ignored some aspects of affective experiences such as the typical duration of affective experiences. Finally, previous research has not distinguished between different types of affective experience. However, research on state affect increasingly makes a distinction between moods and emotions. It could well be that the time one is in a happy mood and the frequency one feels happy about something are separable traits.

We introduce a framework that makes logical distinctions between different facets of affective experiences. Each facet can logically be related to a unique set of dispositions and can in principle show any empirical relations to other facets. The facet framework has several advantages. First, it shows gaps in structural models of trait affect. Second, the facet framework can explain contradictory findings in the literature. Third, the facet framework can be used to organize research on trait affect. Finally, the facet framework makes an attempt to link research on trait affect with research on state affect.

FACETS OF AFFECTIVE EXPERIENCES

The facet framework of affective experiences integrates recent developments in personality and emotion research (Cacioppo & Berntson, 1994; Frijda, 1993; Frijda, Mesquita, Sonnemans, & VanGoozen, 1991; Larsen & Diener, 1987; Ortony, Clore, & Collins, 1988; Reisenzein, 1994; Schimmack & Diener, 1997). In particular, the framework differentiates types of affective experiences (e.g., moods vs. emotions), qualities of affective experiences (e.g., pleasure, displeasure), and aspects of affective experiences (e.g., intensity, duration, and frequency). A facet is defined as a combination of a type, an aspect, and a quality. For example, to feel ashamed for 5 minutes combines the type emotion with the aspect duration and the quality displeasure. On the other hand, being extremely relaxed combines the type mood with the aspect intensity and the quality pleasure.

Types of Affective Experiences

Research on state affect has revealed diverse processes that influence affective experiences. These processes range from cognitive appraisals (Frijda, 1986; Lazarus, 1991; Ortony et al., 1988; Reisenzein & Spielhofer, 1994; Scherer, 1984) to different breathing patterns and changes in brain temperature (Zajonc, Murphy, & Inglehart, 1989) to feedback of the immune system (Maier & Watkins, 1998). As a consequence, it became increasingly clear that one can differentiate types of affective experiences according to their causes (Clore, 1994; Izard, 1993).

We believe that one of the most salient distinctions between causes of affects is that between emotions and moods (Frijda, 1993). This distinction is already made in everyday language. Schimmack and Siemer (1999) asked German and U.S. American participants to rate several affect words according to how typical they are as descriptors of moods or emotions. The results in both languages showed that some concepts were more typical descriptors of moods than emotions (e.g., *relaxed, tense, grouchy*), whereas others were more typical descriptors of emotions than moods (e.g., *guilt, shame, hate, love, gratitude, envy*). The authors agreed with other researchers (Clore, 1994; Frijda, 1993; Reisenzein & Schönplflug, 1992) that intentionality is the best criterion for a scientific distinction between moods and emotions. Emotions are directed at someone or something, whereas moods are not. Closely related to this distinction is the fact that emotions are typically elicited by events, objects, or persons that then become the object at which the affect is directed. In contrast, moods are undirected and can have a variety of external and internal causes.

Moods are sometimes regarded as more enduring, dispositional, or trait-like than emotions (cf. Ekman & Davidson, 1994). The reason might be that the causes of moods often are more internal. However, we consider both emotions and moods as states. Feeling relaxed is a mood state, whereas feeling ashamed is an emotion state. Ample evidence shows that moods are states that vary over time (Diener & Larsen, 1984; Green, Goldman, & Salovey, 1993; Schimmack, 1997; Steyer, Schwenkmezger, Notz, & Eid, 1994). Hence, it would be a mistake to identify moods with traits and emotions with states. Both emotions and moods are states, but they are different types of states that are likely to have partly different causes. Hence, research on trait affect should distinguish between emotions and moods because emotion-related traits might be separable from mood-related traits.

Aspects of Affective Experiences

Another distinction between affective experiences can be made in terms of aspects of the experiences.

Aspects refers to the fact that affective experiences have an intensity (Larsen & Diener, 1987; Reisenzein, 1992, 1994; Sonnemans & Frijda, 1995), a duration (Averill, 1982; Frijda et al., 1991), and can be elicited with different frequencies (Diener, Larsen, Levine, & Emmons, 1985; Diener et al., 1995; Izard et al., 1993). We consider all aspects as mutually exclusive properties of affective experiences. Frequency is defined as the number of times an affect is elicited, that is, a change from absence to presence of an affect. Duration is defined as the time an affect is present after elicitation until it ceases to be present. Intensity is defined as the intensity of the affective experience at any moment in time. However, it can be the average intensity over a time period during which the affect is experienced at all. It is not uncommon in affect research to combine several of these aspects. For example, the question of how much pleasant affect one experiences refers to all three aspects, although it is unclear how people weight the different aspects when they answer this question. The question of how much affect participants experienced in reaction to a single event is a combination of intensity and duration, although people seem to neglect duration in retrospective judgments (Fredrickson & Kahneman, 1993). Finally, the amount of time one feels an affect combines frequency with duration independent of the intensity of the experience.

In a seminal study, Diener et al. (1985) separated individual differences in the frequency and intensity of affective experiences. The authors demonstrated that individual differences in the frequency component were largely unrelated to individual differences in the intensity component. This finding has been replicated with different methods in several samples (Larsen & Diener, 1987; Schimmack & Diener, 1997). Furthermore, the two aspects of trait affect are related to different outcomes. The frequencies of pleasant and unpleasant affects are strong predictors of life satisfaction (Diener, Sandvik, & Pavot, 1991), especially in individualistic cultures (Suh, Diener, Oishi, & Triandis, 1998). In contrast, individual differences in the typical intensity of affective experiences are unrelated to life satisfaction judgments (Diener et al., 1991).

Individual differences in the typical duration of affective experiences have received less attention. Larsen (1987) demonstrated individual differences in the variability of moods over time. This research suggests that some people maintain the same mood over longer periods of time. Nolen-Hoeksema, Morrow, and Fredrickson (1993) showed that a ruminative response style can prolong depressed moods and that individuals differ in their typical response to depressive moods. More research is needed, however, to explore how individual

differences in the duration of unpleasant moods relate to duration of pleasant moods and to other facets.

Qualities of Affective Experiences

Emotion researchers have developed different structural models of current affective experiences (Oatley & Johnson-Laird, 1987; Ortony et al., 1988; Reisenzein, 1992, 1994; Shaver, Schwartz, Kirson, & O'Connor, 1987). Most of these models assume an affective core, that is, either (a) a set of basic emotions (Oatley & Johnson-Laird, 1987), a set of basic affect dimensions (Reisenzein, 1992, 1994), or pleasure and displeasure (Ortony et al., 1988). These models assume that at least some emotion concepts (e.g., jealousy) do not refer to a distinct affective feeling but refer to an affective core with additional cognitive elements (e.g., Oatley & Johnson-Laird, 1987; Ortony et al., 1988; Reisenzein, 1994).

At present, research on state affect has not reached a consensual taxonomy of qualities of affective experiences. Therefore, any assumption about this component of affective experiences in the facet framework has to be tentative. Nevertheless, the valence of affective experiences is usually the most salient distinction of affect states (Ortony et al., 1988; Schimmack & Reisenzein, 1997; Shaver et al., 1987), and many researchers consider pleasure and displeasure as core elements of affective experiences (Bain, 1876; Cacioppo & Berntson, 1994; Diener & Iran-Nejad, 1986; Ortony et al., 1988; Reisenzein, 1992, 1994).

Moreover, the most consistent finding in research on trait affect is that trait measures of the same valence show positive associations (Diener et al., 1995; Izard et al., 1993; Schimmack & Diener, 1997; Watson & Clark, 1992). Therefore, the facet framework at present considers pleasure and displeasure as the primary qualitative distinction between affective experiences. However, we do not propose that the quality of affect can be reduced to pleasure and displeasure. Ample evidence indicates that people distinguish more than 20 emotion categories (Reisenzein & Hofmann, 1993). Furthermore, even within emotion categories such as regret, one can make finer and important distinctions (Gilovich & Medvec, 1994). Existing models of trait affect already make finer distinctions among pleasant and unpleasant affects (Diener et al., 1995; Izard et al., 1993; McCrae & Costa, 1997; Watson & Clark, 1992). Future research is needed to determine the number and the nature of these finer distinctions.

FACETS OF AFFECTIVE EXPERIENCES AND AFFECTIVE DISPOSITIONS

The facet framework is based on a logical analysis of affective experiences. However, the fact that one can dis-

tinguish facets of affective experiences does not imply that each facet is influenced by separate dispositions. Investigations are needed to determine the empirical relations between conceptually distinct facets. In a recent study, Schimmack and Diener (1997) explored the relations between four facets, namely, intensity of pleasant emotions, intensity of unpleasant emotions, frequency of pleasant emotions, and frequency of unpleasant emotions. The authors found that the trait to experience intense pleasant emotions was positively correlated with the trait to experience unpleasant emotions intensely. They also found a strong positive correlation between the two frequency facets. Furthermore, they found that individual differences in the intensity of (pleasant and unpleasant) emotions were unrelated to frequencies of (pleasant and unpleasant) emotions. Hence, different dispositions influence how often someone feels emotions and the intensity of their typical emotional experiences.

In addition, Schimmack and Diener (1997) compared the relation between intensity of pleasant and unpleasant emotions with intensity of pleasant and unpleasant moods. To do so, they compared the results of two studies. In one study, participants reported the intensity of pleasant and unpleasant affects after positive or negative events. In the other study, participants reported the intensity of pleasant and unpleasant affect at random moments. The authors argued that event-elicited affects are likely to be directed at something or someone, whereas affects at random moments are more likely to be undirected. Hence, Study 1 explored the relation for intensity of emotions, whereas the latter study explored the relation for affects that comprise a larger sample of moods. The authors found a stronger correlation between intensities of pleasant and unpleasant emotions than for pleasant and unpleasant moods.

In the present article, we present further evidence that the relation between pleasant and unpleasant affect is different for different pairs of facets. In particular, we are going to argue that the frequencies of pleasant and unpleasant emotions are positively correlated but that the amount of time people are in a pleasant and unpleasant mood are negatively correlated. First, we present data on the relation between frequencies of pleasant and unpleasant emotions. This part comprises three studies because we predict a positive correlation between frequencies of pleasant and unpleasant emotions, a hypothesis that is inconsistent with previous findings and needs more empirical support. Second, we present data on the relation between the amounts of time people are in a pleasant or in an unpleasant mood. This part comprises only one study because our findings basically replicate previous findings.

PART 1: FREQUENCY OF PLEASANT AND UNPLEASANT EMOTIONS

The frequency of affective experiences is the most prominent aspect in past research on trait affect. Many well-known personality questionnaires include questions about the frequency of affects rather than their duration or intensity. For example, in the trait form of the State-Trait-Anxiety-Inventory (STAI) (Spielberger, Gorsuch, & Lushene, 1970), people report frequencies of various affects (e.g., never, seldom, often, always). In other common personality questionnaires, people are asked to agree or disagree with statements such as "I often feel tense and jittery" or "I am seldom sad or depressed" (e.g., McCrae & Costa, 1997).

Several articles have explored the relation between the frequency of pleasant and unpleasant affect across individuals. The obtained relations range from strong negative (Green et al., 1993) to moderately negative correlations (Diener et al., 1995; Warr, Barter, & Brownbridge, 1983) to independence (Bradburn, 1969; Costa & McCrae, 1980; Watson & Clark, 1992). Finally, Schimmack and Diener (1997) reported a strong positive correlation. Several factors contribute to this confusing picture. First, some studies did not measure the frequency of affects to begin with. For example, Bradburn's questionnaire asks for the occurrence of positive and negative events but not for the frequency of emotions (Diener, 1984; Warr et al., 1983). Other studies assessed a different pair of facets. For example, Green et al. (1993) explicitly noted that they studied "the general character of their [participants] moods, rather than the frequency with which they experience moods of different sorts" (p. 1032).

Another factor is the selection of affect words (cf. Watson, 1988). To explore emotion traits, it is vital to select a set of typical emotion concepts (e.g., Shaver et al., 1987). Only few studies meet this criterion (Diener et al., 1995; Izard et al., 1993). Izard et al. (1993) obtained frequency judgments of 10 typical emotions in addition to shyness and self-hostility. The authors do not report the correlation between frequencies of pleasant and unpleasant emotions. However, we could determine the correlation because the intercorrelations among all 12 emotions were reported. We established a structural equation model in which all pleasant emotions loaded on one factor and all unpleasant emotions loaded on the other factor ("surprise" was excluded from this analysis). The estimated correlation between the two factors was $-.46$.

Diener et al. (1995) obtained frequency judgments of 24 emotions with three different methods (long-term frequency judgments, averaged daily frequency judgments, and peer reports). The authors fitted a multitrait, multimethod model to the data with six first-order factors (Love, Joy, Anger, Sadness, Fear, and Guilt) and two

second-order factors (Pleasantness and Unpleasantness). The estimated correlation between the pleasure and displeasure factors was very similar to the correlation in Izard's (1993) study (-.44).

Schimmack and Diener (1997) asked people to rate how they would feel in reaction to hypothetical scenarios or in reaction to daily events. Ratings were made for several typical emotions on an intensity scale from 0 (*not at all*) to 6 (*extremely intensely*). Participants were explicitly instructed that only 0 responses indicated the absence of the emotion, whereas responses from 1 to 6 indicated the presence of the emotion at various levels of intensity. Hence, it was possible to use the number of responses greater than 0 as a frequency measure that is independent of intensity (see also Scherer & Ceschi, 1997; Schimmack, 1997; Schimmack & Hartmann, 1997). As noted earlier, the frequency of pleasant emotions was highly positively correlated with the frequency of unpleasant emotions in this study.

There are three methodological factors that distinguish Schimmack and Diener's (1997) study from previous investigations (Diener et al., 1995; Izard et al., 1993). First, in Schimmack and Diener's (1997) study, the number of positive and negative emotional events was constant for all participants, whereas differences in the number of positive and negative events influenced the frequency of pleasant and unpleasant emotions in the other studies. It could be that a negative correlation between positive and negative events explains the discrepancies. Second, Schimmack and Diener (1997) used ratings of current feelings of emotions and statistically aggregated responses, whereas the other studies relied on retrospective frequency judgments. It could be that memory distorts the actual frequencies of emotions leading to a negative correlation for retrospective judgments, whereas the actual frequencies are positively correlated. Third, Schimmack and Diener's (1997) findings were based on a measure of absolute frequencies, whereas the other studies relied on rating scales with vague quantifiers (e.g., *rarely*, *often*) (cf. Pepper, 1981). We are aware only of a single study that compared absolute estimates with vague quantifier ratings of emotions (Schaeffer, 1991). In this study, vague quantifier ratings indicated that African Americans experienced more boredom than did Caucasian respondents, but this finding was not replicated with absolute estimates.

We propose that Schimmack and Diener's (1997) study accurately reflects a positive correlation between the trait to experience pleasant emotions frequently and the trait to experience unpleasant emotions frequently. Furthermore, we propose that rating scales with vague quantifiers bias this correlation in a negative direction. The explanation for this hypothesis is based on an analogy to research on self-concepts of ability (Marsh, 1986).

In this literature, a consistent finding is that the actual abilities in math and verbal ability are positively correlated. However, self-ratings of ability in these two domains show independence. In other words, self-ratings of ability are biased in a negative direction compared to the actual correlation between abilities. Marsh (1986) explains this finding as due to the choice of two different standards of comparisons. First, people compare themselves with others. This external standard of comparison produces a positive correlation because some students are better than others in both domains. Second, students compare their abilities in one domain with their own abilities in other domains. As a consequence, people who are better in math devalue their ability in verbal ability, and vice versa. The use of internal standards of comparison biases the correlation between actual abilities in a negative direction (see also Biernat, Manis, & Kobrynowicz, 1997; Biernat, Manis, & Nelson, 1991).

We believe that vague quantifiers tend to invoke the use of internal standards of comparison in frequency judgments of emotions. For example, when participants rate the frequency of joy, they might partly rely on the frequency of sadness as a standard of comparison, and vice versa. This would mask individual differences in the absolute frequency of emotions. For example, a person who overall experiences many emotions could experience 50 times joy and 20 times sadness, whereas an individual who experiences emotions less often experiences 25 times joy and 10 times sadness. Both respondents experience joy more often than sadness. If they would base their ratings on the relative frequency of one emotion compared to other emotions, both participants could truthfully answer *often* for joy and *rarely* for sadness. However, relying on other emotions as standards of comparison masks the fact that the former individual experiences both joy and sadness more frequently.

STUDY 1

Participants

The first study was a semester long and was conducted at the Free University Berlin. Eighty (24 male and 56 female) participants with a mean age of 25 completed all data collections (see Study 2 in Schimmack & Hartmann, 1997, for a more detailed description of the sample).

Materials and Procedure

At the core of the study was a diary study over a 14-day period. Two times a day, participants made absolute frequency judgments (i.e., 0 = *none*, 1 = *once* . . . 5 = *5 times*, 6 = *6 times or more*) of 34 emotions. Judgments were made at a subjectively determined midpoint of the day and before going to bed. A subjective midpoint of the day was used

because participants' sleep-wake cycles differed greatly across individuals. Midday judgments covered the period from getting up until midday, and judgments before going to bed covered the period from midday until the end of the day.

The pleasant emotions included in this study were affection, contentment, euphoria, gratitude, joy, hope, love, pride, and relief. The unpleasant emotions included in this study were anger, anxiety, contempt, depression, disappointment, discontentment, homesickness, disgust, dislike, embarrassment, envy, fear, guilt, hate, helplessness, hopelessness, jealousy, loneliness, sadness, rage, regret, and shame. The feelings of sexual arousal, sympathy, and longing were included in the questionnaire but excluded from the present data analyses.

Two times before the diary study, participants judged the frequency of the same 34 emotions during the past week. These judgments were made 2 weeks apart, and the second assessment was made 1 month prior to the daily diary study. The weekly judgments were made on a 7-point scale with vague quantifiers as category labels (viz., 0 = *never*, 1 = *very rarely*, 2 = *rarely*, 3 = *sometimes*, 4 = *often*, 5 = *very often*, 6 = *nearly always*). Immediately after the diary study ended, participants repeated the weekly judgments twice, once for the 1st week and once for the 2nd week of the diary study. These two postdiary judgments were averaged for the present study.

Results and Discussion

We averaged the frequencies of pleasant emotions and the frequencies of unpleasant emotions separately for each measure, namely (a) averaged half-daily absolute estimates, (b) 1st week vague quantifier ratings before the diary study, (c) 2nd week vague quantifier ratings before the diary study, and (d) weekly vague quantifier ratings after the diary study. For each measure, we computed the correlation between frequencies of pleasant and unpleasant emotions. Table 1 shows the expected differences in the size of the correlations between absolute estimates and vague quantifier ratings. Absolute estimates were highly positively correlated. The correlations for vague quantifier ratings were much lower and nearly independent before and slightly positively correlated after participation in the diary study.

The next analyses directly address the question of whether vague quantifier ratings are influenced by internal standards of comparisons. The analyses closely follow Marsh's (1986) work on ability concepts. If vague quantifier ratings were influenced by internal standards, then vague quantifier ratings of pleasant emotions should be negatively related to the absolute frequencies of unpleasant emotions, and vice versa. We tested this prediction by means of regression analyses in which

TABLE 1: Correlations Between the Frequencies of Pleasant and Unpleasant Emotions (Study 1)

Frequency Measure	r
Absolute estimates	
Averaged daily estimates	.58**
Vague quantifier ratings	
First prediary vague quantifier ratings	-.04
Second prediary vague quantifier ratings	-.28*
Postdiary vague quantifier ratings	.21

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

vague quantifier ratings of pleasant (unpleasant) emotions were regressed onto both absolute estimates of pleasant and unpleasant emotions. The results fully supported the hypothesis for vague quantifier ratings of unpleasant emotions (see Figure 1): For each of the three vague quantifier ratings of unpleasant emotions, the absolute frequencies of pleasant emotions were a significant negative predictor. Absolute frequencies of unpleasant emotions were negatively related to vague quantifier ratings of pleasant emotions, but the effect was not significant in all cases.

In sum, Study 1 showed that Schimmack and Diener's (1997) finding of a positive correlation between frequencies of pleasant and unpleasant emotions can be replicated with a different method, namely, aggregated absolute frequency estimates over a short period of time. This finding rules out the explanation that constraining the number of positive and negative events in Schimmack and Diener's (1997) study accounts for the discrepant results. The results do not fully rule out a memory explanation because absolute estimates were made after short time periods, whereas the vague quantifier ratings covered a full week. However, the present study provides some support for the third explanation in that vague quantifier ratings of one quality were influenced by the frequency of emotions of the opposite valence. In other words, vague quantifier ratings of pleasant emotions also indicate how rarely someone feels unpleasant emotions. One shortcoming of Study 1 was that participants did not make absolute estimates and vague quantifier ratings for the same time period so that response format and time frame were confounded. We addressed this issue in the next study.

STUDY 2

Participants

One hundred and fifty students in a semester-long course at the University of Illinois took part in this study as a course requirement. Four participants had missing values in the data needed for the present analyses; there-

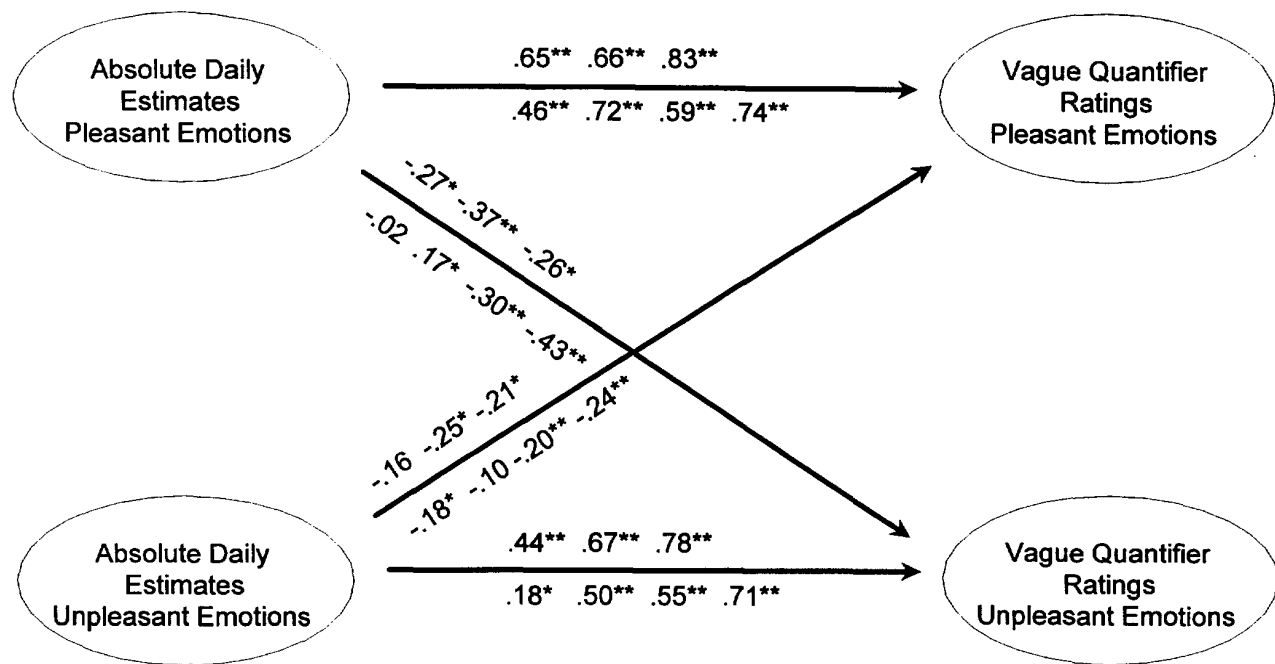


Figure 1 Vague quantifier ratings of pleasant and unpleasant emotions regressed onto daily averages of pleasant and unpleasant emotions.
NOTE: Results from Study 1 are above the arrows (first prediary, second prediary, and postdiary vague quantifier ratings). Results from Study 2 are below the arrows (prediary and postdiary absolute estimates and prediary and postdiary vague quantifier ratings).
* $p < .05$. ** $p < .01$.

fore, the actual sample size was reduced to 146 participants (107 females, 39 males).

MATERIALS AND PROCEDURE

Participants estimated the absolute frequencies of 20 emotions at the end of each day over a 3-week period. We reduced the number of emotions to allow for additional questions that are not relevant in the present context. Furthermore, we asked for daily estimates to reduce the number of judgments because the diary period was longer and used a free-response format. That is, participants could write down any absolute number that deemed appropriate. This change was motivated by the fact that the bound response format in Study 1 might have influenced our results. The pleasant emotions included in this study were affection, contentment, euphoria, gratitude, joy, pride, and relief. The unpleasant emotions included in this study were anger, anxiety, contempt, disappointment, embarrassment, envy, guilt, hopelessness, (psychologically) hurt, romantic jealousy, sadness, and worry.

The days immediately before and after the diary study, participants estimated how often they experienced all 20 emotions in the past 3 weeks. These esti-

mates were made twice with different response formats. First, participants made vague quantifiers ratings without any numeric categories (*never, very rarely, rarely, sometimes, often, very often, extremely often*). Immediately afterward, participants estimated absolute weekly rates (i.e., "How many times per week did you experience joy during the past 3 weeks?"). Participants could enter whatever number deemed appropriate.

Results and Discussion

The analyses follow the procedures in Study 1. First, the correlations between averaged pleasant and averaged unpleasant emotions were computed. Table 2 shows that the positive correlation for daily absolute estimates in Study 1 was replicated. In addition, long-term absolute estimates before and after the diary study also showed positive correlations. Furthermore, vague quantifier ratings again showed weaker, slightly negative correlations.

Figure 1 shows the results of the regression analyses in which vague quantifier ratings were regressed onto the daily absolute estimates. The results replicated the finding of Study 1 that vague quantifier ratings are negatively related to the absolute frequency of emotions of the

TABLE 2: Correlations Between the Frequencies of Pleasant and Unpleasant Emotions (Study 2)

<i>Frequency Measure</i>	<i>r</i>
Absolute estimates	
Averaged daily	.37
Prediary	.43
Postdiary	.58
Vague quantifier ratings	
Prediary	-.30
Postdiary	-.22

NOTE: All correlations are significant at the 1% level.

opposite valence. For the sake of comparison, absolute estimates before and after the diary study were submitted to the same analyses. These analyses should not show negative regression weights across valence if the regression weights indicate the use of internal standards of comparison. In support of this prediction, the analyses revealed two nonsignificant coefficients, one significant positive coefficient, and only one significant negative coefficient (see Figure 1).

In sum, the results closely replicate the findings in Study 1. Moreover, the results extend previous findings in that absolute estimates differ from vague quantifier ratings even when these estimates cover the same time period and are made at the same time by the same participants. This finding rules out the second hypothesis that the discrepancies are due to memory effects. We do not have data on daily vague quantifier ratings, but Diener et al. (1995) found a negative correlation for this combination of time frame and response format. Hence, overall, the data show a clear and consistent pattern. No matter which time frame is used, absolute frequency estimates yield positive correlations between frequencies of pleasant and unpleasant emotions but vague quantifiers produce slightly negative correlations.

In addition, Study 2 replicated the finding that vague quantifier ratings not only reflect the absolute frequencies of same-valence emotions but are also negatively related to the absolute frequencies of emotions of the opposite-valence. This finding supports the hypothesis that vague quantifier ratings are influenced by internal standards of comparison.

STUDY 3

One limitation of the previous studies is the exclusive reliance on self-report measures. We carried out Study 3 to test the positive correlation between frequencies of pleasant and unpleasant emotions with a measure that does not rely on self-report. We used a recall task, assuming that people who experience more emotions can recall more memories of emotional experiences and can

recall emotion memories faster (cf. Tversky & Kahneman, 1973). Participants had 30 seconds to recall emotional experiences in the past week for several emotions. We derived two memory measures from these data that have been used in previous studies, namely, (a) the latency to retrieve the first memory and (b) the total number of recalled memories (e.g., Davis & Schwartz, 1987). Participants also made absolute frequency estimates before the recall task. We predicted consistent positive correlations between pleasant and unpleasant emotions across all measures.

Method

Forty-two students participated in this study. Twenty-six (20 male, 6 female) students lived in a dormitory and volunteered to participate in the study. Sixteen (12 female, 4 male) students were psychology students at the Free University Berlin who participated in return for course credits. On average, the participants were 25 years old with an age range from 19 to 32.

Six pleasant emotions (contentment, euphoria, gratitude, joy, love, pride) and 10 unpleasant emotions (anger, anxiety, contempt, disappointment, disgust, embarrassment, envy, guilt, loneliness, sadness) were used as stimuli. The entire study was run on personal computers. Participants first entered their sex and age. Next, the participants worked on the frequency judgment task. Participants were required to estimate the absolute frequencies of emotions in the past week (e.g., "In the past week, I experienced [joy] . . . times"). Each of the 16 emotion words appeared on the screen in a new random order for each participant. After the frequency judgments were completed, the instructions for the recall task were displayed. Participants were instructed to recall experiences from the past week in which they experienced the displayed emotion. Participants were instructed that it was not necessary to recall an experience completely. For example, participants might recall kissing their romantic partner without recalling when or where it happened. After reading the instructions, participants started the task by pressing the return key. During the recall task, each of the 16 emotion words was presented for 30 seconds in a new random sequence for each participant. Participants pressed the space bar whenever they recalled a related episode and the computer recorded the elapsed time since the presentation of the emotion word.

Results and Discussion

Pleasant emotions and unpleasant emotions were averaged for each of the three measures. Table 3 shows the correlations between all measures. Most important, the correlation between pleasant and unpleasant emotions was significantly positive for each of the three meas-

TABLE 3: Correlations Between Frequency Judgments, Retrieval Latencies, and Number of Recalled Memories of Pleasant and Unpleasant Emotions

	M	SD	PFJ	PRL	PNM	UPFJ	UPRL	UPNM
Pleasant emotions								
Frequency judgments (PFJ)	8.85	14.96						
Retrieval latencies (PRL)	7.76	4.98	.28					
Number of memories (PNM)	4.19	2.68	.63**	.65**				
Unpleasant emotions								
Frequency judgments (UPFJ)	3.62	4.40	.61**	.22	.39*			
Retrieval latencies (UPRL)	11.25	4.98	.26	.54**	.48**	.29		
Number of memories (UPNM)	2.19	1.13	.24	.45**	.55**	.35*	.79**	

NOTE: Means of frequency judgments and number of recalled memories are absolute frequencies. Means of retrieval latencies are seconds. For the correlational analyses, the retrieval latencies were reversed because shorter latencies indicate a higher availability of emotion memories.

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

ures. It was not possible to use structural equation modeling for a multitrait, multimethod analysis (cf. Diener et al., 1995) because of the small sample size. Instead, we submitted the three pleasant emotion measures to a factor analysis and computed participants' factor scores on the first and only factor. These scores reflect the joint variance in frequency of pleasant emotions that is shared by the three methods. The same procedure was carried out for the three unpleasant emotion measures. Finally, we computed the correlation between the pleasant and unpleasant emotion factors that was highly positive ($r = .61$). Furthermore, the consistent positive correlations across valence and methods in Table 3 provide further evidence that this relation is substantive and not simply a response set in absolute frequency estimates. However, the different-trait-same-method correlations were higher than the different-trait-different-method correlations, indicating a method effect on the relation between pleasant and unpleasant emotions.

PART 1: DISCUSSION

Three studies tested the hypothesis that frequencies of pleasant and unpleasant emotions are positively correlated across participants. Each of our studies has a weakness, but taken together, they provide strong support for this hypothesis. First, one might criticize that Studies 1 and 2 relied exclusively on frequency judgments. However, Study 3 replicated the finding with a recall task of emotion memories. Second, one might criticize that both the recall task and frequency judgments are influenced by individual differences in the accessibility (i.e., how well people can retrieve emotion memories) rather than the availability (i.e., the number of emotional experiences) of emotion memories (cf. Schimmack & Hartmann, 1997). However, Schimmack and Diener (1997) found positive correlations when frequencies were derived from momentary ratings of life events or hypothetical scenarios. Accessibility of emo-

tion memories cannot explain this finding. Third, one might criticize that the positive correlation is due to response sets. However, the positive correlation emerged with multiple measures that are unlikely to be influenced by a single response set. Furthermore, general response sets cannot explain why the positive correlation was not obtained with vague quantifier ratings. Finally, the present studies challenged the validity of vague quantifier ratings. Participants seem to rely partly on internal standards of comparison for those judgments that mask individual differences in the overall frequency of their emotions. In sum, this pattern of results is more consistent with the idea that frequencies of pleasant and unpleasant emotions are positively correlated.

In addition, a positive correlation between pleasant and unpleasant emotions is consistent with the finding that people who encounter more positive events also encounter more negative events (Headey & Wearing, 1989; Magnus, Diener, Fujita, & Pavot, 1993; Suh, Diener, & Fujita, 1996). All other things being equal, the positive correlation between positive and negative life events should lead to a positive correlation between the frequency of pleasant and unpleasant emotions because emotions are elicited by life events. However, even when the number of events is held constant, some people are more likely to react with more emotions than others to the same event (Schimmack & Diener, 1997). Finally, a positive correlation for frequencies of emotions is compatible with evidence that people are unlikely to experience pleasant and unpleasant emotions at the same time (Diener & Iran-Nejad, 1986; Schimmack & Reizenzein, 1997). The positive correlation for frequency of emotions is possible because people do not experience emotions all the time.

Furthermore, it is noteworthy that the correlation between frequencies of pleasant and unpleasant emotions is not perfect. Therefore, the present findings allow some people to experience more pleasant emo-

tions than unpleasant emotions and others to experience more unpleasant emotions than pleasant emotions. As a consequence, individual differences in the relative frequency of pleasant versus unpleasant emotions can still predict life satisfaction (Diener et al., 1991; Suh et al., 1998). However, the present data suggest that two people with the same hedonic balance score can differ greatly in the way they achieve happiness in their lives. Some individuals might seek out exciting new experiences, leading to many pleasant and unpleasant emotions in their lives, whereas others lead a calm life and experience fewer pleasant and fewer unpleasant emotions.

PART 2: TIMES OF PLEASANT AND UNPLEASANT MOOD

The facet framework differentiates between the frequency of emotions and the amount of time an individual is in a pleasant or unpleasant mood. We are going to demonstrate that different correlations between pleasant and unpleasant affect exist for these two pairs of facets. In particular, we argue that the amounts of time people feel a pleasant and an unpleasant mood are negatively correlated because (a) pleasant and unpleasant moods are negatively related at any moment in time and (b) people experience some mood most of the time. Therefore, the time people are in a pleasant mood (and not in an unpleasant mood) is bound to be negatively correlated with the time people are in an unpleasant mood (and not in a pleasant mood).

Method

We tested this prediction using data from the same participants as in Study 2. During the diary period, at the end of each day, participants estimated the percentage of time that they were in a pleasant and in an unpleasant mood. Participants were not instructed that these percentages had to add up to 100%. Therefore, participants' estimates could add up to more than 100% if they experienced pleasant and unpleasant moods concurrently or to less than 100% if they experienced neither pleasant nor unpleasant mood for some time. Before and after the diary period, participants estimated the amount of time that they were in a pleasant and in an unpleasant mood during the past 3 weeks.

Results and Discussion

Table 4 shows the means of all measures. Participants were most of the time in a pleasant mood. Furthermore, the sum of the times participants were in a pleasant and in an unpleasant mood was about 90%. This finding indicates that participants reported experiencing some mood most but not all of the time. Finally, participants' prediary and postdiary estimates predicted the percent-

ages of pleasant and unpleasant mood in the diary data remarkably well, especially for unpleasant moods.

Table 4 shows the intercorrelations among the six variables. The pattern of results shows that (a) participants' prediary and postdiary estimates reflect daily averages to some degree, (b) postdiary estimates are more closely related with daily averages than are prediary estimates, and (c) most important, all correlations across valence were significantly negative. Finally, we fitted a two-factor model to the data: Pleasant mood percentages loaded on one factor and unpleasant mood percentages loaded on the other factor. Furthermore, we allowed the errors of the same method to be correlated (e.g., the error terms of the two daily averages). The model fitted the data quite well, $\chi^2(5, N = 146) = 2.50, p = .78$. The two factors correlated negatively ($r = -.58, p < .01$). This finding supports our hypothesis that times of pleasant and unpleasant mood are negatively correlated. However, the correlation is not perfect, which would be the case if (a) people always experience some mood and (b) pleasant and unpleasant moods never co-occur.

In sum, the times people were in a pleasant mood were negatively correlated with the times they were in an unpleasant mood. It is noteworthy that this finding was obtained with the same participants who produced positive correlations for absolute frequency estimates and only weak negative correlations for vague quantifier ratings of emotions. Therefore, the divergent results cannot be attributed to different samples. Two factors are responsible for the negative correlation between pleasant and unpleasant moods over extended time periods. First, at any moment in time, pleasant and unpleasant mood are negatively correlated (Diener & Iran-Nejad, 1986; Eid, 1995; Green et al., 1993). Second, this pattern exists most of the time because there are relatively few times in which people do not experience a pleasant or unpleasant mood. Therefore, the correlation at any moment in time is maintained in averages across days or weeks.

We noted earlier that amount of time is a combination of frequency and duration. The present study does not address whether both the duration of pleasant and unpleasant moods and the frequency of pleasant and unpleasant moods are negatively correlated. It is possible that the frequencies of pleasant and unpleasant moods are positively correlated. Larsen's (1987) research on mood swings suggests that some people have more frequent onsets of pleasant and unpleasant moods because their moods change more rapidly. In this case, the negative correlation for the time people are in pleasant and unpleasant moods would have to be due to an inverse relation between durations of pleasant and

TABLE 4: Means, Standard Deviations, and Correlations of the Amount of Time in a Pleasant and Unpleasant Mood

	M	SD	PDA	PPrJ	PPoJ	UPDA	UPPrJ	UPPoJ
Pleasant mood								
Daily averages (PDA)	61	15						
Prediary judgments (PPrJ)	65	23	.43					
Postdiary judgments (PPoJ)	68	18	.82	.42				
Unpleasant mood								
Daily averages (UPDA)	26	11	-.54	-.30	-.42			
Prediary judgments (UPPrJ)	27	18	-.30	-.53	-.26	.49		
Postdiary judgments (UPPoJ)	27	16	-.39	-.27	-.42	.63	.40	

NOTE: All correlations are significant at the 1% level.

unpleasant moods. Future research is needed to separate these two aspects of moods.

GENERAL DISCUSSION

Personality psychologists have studied the structure of trait affect for some time. In the present article, we present evidence that it is helpful to distinguish facets of affective experiences. Different structural relations can be found between different facets. The correlation between frequencies of pleasant and unpleasant emotions is positive. However, the correlation between the time that people are in a good or a bad mood is negative.

Description of Affect-Related Traits

One major achievement in the last two decades has been to come to some agreement about a global descriptive system of personality traits (McCrae & Costa, 1997). In the five-factor model, two factors describe individual differences in affective experiences, namely, extraversion includes pleasant affects and neuroticism includes unpleasant affects. Each factor is a higher order factor of six lower order factors to accommodate qualitative distinctions between affects, for example, anger, anxiety, and sadness for neuroticism.

Our facet framework also suggests that pleasure and displeasure are overarching organizational features of affective experiences that organize the structure of trait affect at the most global level. However, the facet framework reveals two weaknesses of the Big Five model as a complete description of trait affect. First, McCrae and Costa (1997) pointed out that not all existing traits are readily encoded in language. The facet framework reveals that item samples of previous studies neglected several facets of affective experiences (e.g., the duration of affective experiences). As a consequence, it is unclear how these facets are related to the global structure of personality traits. Future studies have to fill this gap. Existing evidence already shows that, for example, extraversion is related to the intensity and the frequency of pleasant emotions (Emmons & Diener, 1986; Schim-

mack & Diener, 1997; Watson & Clark, 1992). However, that does not mean that extraversion is a single disposition to experience all pleasant affects more intensely and more frequently. Rather, extraversion is a combination of at least two separable dispositions, namely, to experience pleasant emotions more frequently and to experience pleasant emotions more intensely.

Furthermore, the five-factor structure has problems to accommodate some of the present findings. Extraversion and neuroticism are conceptualized as independent dimensions. However, the present study shows a positive correlation for the frequency of pleasant and unpleasant emotions and a negative correlation for the times people are in good versus bad moods. The average relation between pleasant facets and unpleasant facets might be independence; however, it does not reveal the operation of two independent dispositions. Rather, it shows that one has averaged out the influence of many dispositions that influence different facets in opposite ways. We suggest that the facet framework can serve as a starting point for a more detailed description of affect dispositions.

Measurement of Affect-Related Traits

Beyond our emphasis on the facets of affective experiences, the present findings have implications for empirical studies of affect-related traits. As noted earlier, trait affect can be measured in two ways: One can assess affect repeatedly and average the responses (Schimmack & Diener, 1997), or one can ask people to report on affect-related traits. The latter alternative is used more frequently because it requires less time and money. However, this method makes one more assumption, namely, that relevant information is stored in memory and can be accurately reported via questionnaire items. The present study shows that reliance on retrospective reports can be misleading. The present data showed that one obtains different results depending on the choice of a particular response format.

To use self-reports of traits, personality research needs a theory of the cognitive processes involved in responding to personality items (Fiske, 1986). Furthermore, it is necessary to validate self-reported aggregates of affective experiences with aggregates of multiple measures of actual experiences (Schimmack & Diener, 1997; Thomas & Diener, 1990). It is also important to use multiple measures and response formats to avoid method artifacts (Diener et al., 1995; Green et al., 1993). A better understanding of the cognitive representation of affect-related information in memory also can help to construct better and more accurate measures of trait-related affects. For example, the present research suggests that asking for absolute frequency estimates avoids problems of vague quantifiers. Schimmack and Diener (1997) showed that intensity ratings of several hypothetical scenarios are a better measure of the typical intensity of emotions than is directly asking how intensely one typically feels emotions.

Explanations of Affect-Related Traits

As noted by Wakefield (1989), once a trait has been established, one immediately wants to know what explains the possession of this trait. For example, the present finding of individual differences in the frequency of pleasant emotions immediately leads to the question, "Why is this the case?" The answer cannot be that these people are extraverts because extraversion is partly defined by frequent experiences of pleasant affect (McCrae & Costa, 1997) and something cannot be the cause of itself (Reisenzein, 1995; Wakefield, 1989). One disposition for more frequent experiences of emotions can be individual differences in the frequencies of emotional events (Magnus et al., 1993; Suh et al., 1996). Another disposition could be individual differences in appraisal processes (Schimmack & Hartmann, 1997). Wakefield (1989) pointed out that these explanations are not in conflict with the traditional emphasis of personality research on biological processes and genetic dispositions. For example, even though emotions are elicited by events, genetic factors can influence the frequency of positive and negative life events (Wierzbicki, 1989). Furthermore, the time one experiences pleasant or unpleasant moods might be more strongly determined by biological processes. To conclude, we hope that the facet framework helps to resolve controversies that are more apparent than real. Contradictory findings often are compatible when one recognizes the different facets of individual differences in affective experiences.

NOTE

1. We distinguish between traits and dispositions. For example, one affect-related trait is the typical amount of pleasant affect that an individual experiences after eliminating situational influences. This trait is caused by other traits (e.g., better control of event outcomes, levels of neurotransmitters, etc.) that dispose the individual to experience more pleasant affect (cf. Wakefield, 1989; see also General Discussion).

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