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# The Structure of Negative Emotion Scales: Generalization Over Contexts and Comprehensiveness

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*Abstract*

*In this article, we tested whether a four-dimensional individual-difference structure of negative emotions (Sadness, Fear, Anger, Shame) as described e.g. by Diener, Smith and Fujita can be found in self-report data when the emotions are explicitly linked to three different specific contexts. In addition, we check the comprehensiveness of the structure by adding terms people spontaneously use to directly express negative affect.*

*A situational questionnaire was constructed, based on the emotion terms from Diener et al., and it was administered to 161 participants. The structure we obtained was five dimensional instead of four dimensional: the Shame scale turned out to be two dimensional, with guilt and regret defining one factor, and shame and embarrassment defining another factor. Between these two, there is a moderate positive correlation. The structure is shown to be nearly identical for all three situations. The minor differences we found do contextualize the meaning of the emotional responses.*

*The newly added terms could be captured quite well by the factor Anger. No separate factor was needed, meaning that the obtained five-dimensional structure may be considered comprehensive enough for the field of negative emotions. Copyright © 2002 John Wiley & Sons, Ltd.*

## INTRODUCTION

During the past decades, a large body of research has been accumulated with the aim to clarify the structure of emotions. Despite the unique properties of the different emotions (Izard, 1978), emotional responses tend to be correlated with one another. A few general dimensions (one to three), among which is Negative Affect, can account for the majority of the variance and covariance of reported emotional experiences (see e.g. Berenbaum, Fujita

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& Pfenning, 1995; Diener, Smith & Fujita, 1995; Watson & Clark, 1991, 1992; Watson & Tellegen, 1985).

Looking more specifically to the negative emotions, in many studies, 'Negative Affect' is a general second-order factor underlying more specific negative emotion factors. Although Negative Affect is found in most studies, the specific negative emotion factors differ depending on the author: Watson & Clark (1992), for example, proposed a structure with four first-order factors (Fear, Sadness, Guilt, and Hostility) and one second-order factor (Negative Affect). Berenbaum *et al.* (1995) used only three first-order factors (Sadness, Fear, and Anger) and again Negative Affect as a second-order factor. Chorpita, Albano and Barlow (1998) also included three first-order factors in their research, different from the previous (Depression, Fear, and Anxiety); however, they do not mean their structure to cover the complete domain of negative emotions. In the cross-cultural research of Church, Katigbak, Reyes and Jensen (1999), the first-order factors associated with the second order factor Negative Affect were Anger, Sadness, Fear, Guilt, Restlessness, Apatheticness, and Fatigue. In the structure of affect as found by Diener *et al.* (1995), for the negative emotions a structure similar to that of Watson & Clark (1992) was found: the first-order factors are Fear, Sadness, Shame, and Anger. The second-order factor is again Negative Affect.

The first- and second-order factors just mentioned are often derived from correlations over persons, and measured with frequency measures concerning a specific period in the past (an hour, a day, a week, . . . ) or concerning the past in general. Because the structures refer to individual differences, they may be considered trait structures. However, similar structures were also found using similarity judgments of affects (Reisenzein & Schimmak, 1999). In both approaches, situations are seldom explicitly included in the research instruments (Ten Berge & De Raad, 1999), although, it can be quite interesting to do so, as shown by Deinzer, Steyer, Eid, Notz, Schwenkmezger and Ostendorf (1995) for emotion traits and by Eid, Notz, Steyer and Schwenkmezger (1994) and Mischel and Shoda (1995, 1998, 2000) for other trait domains. If the overall emotion trait structure is about the same in different situations, then the minor situational differences can be seen as context specifications of the emotional responses. If the structure is clearly different depending on the situation, one can question the generality of the emotion trait structure, and the value of an accompanying general emotional response questionnaire.

To test for the influence of situations on emotion trait structures, we chose to reinvestigate a well established structure of negative emotion traits within three different contexts or situations (study/work situation, personal relationships situation, leisure time situation). We chose the structure of Diener *et al.* (1995), who wanted to investigate the unipolar versus bipolar nature of Positive Affect and Negative Affect. The four negative emotion factors, Fear, Anger, Shame, and Sadness, were included as representatives of Negative Affect.

Our perspective is somewhat different. Although important, we are not interested in the unipolarity versus bipolarity issue. Our aim is to find a reasonably simple trait structure for negative emotions that generalizes over contexts and is rather comprehensive, so that it can be used for a simple and general questionnaire. In Diener *et al.* (1995) the negative domain is nicely differentiated into four factors. It is not unusual to find more complexity in negative experiences than in positive experiences (see e.g. Bagozi, Wong & Yi, 1999; Baker, Zevon & Rounds, 1994; Ellsworth & Smith, 1988; Frijda, 1986; Johnson-Laird & Oatley, 1992; Reisenzein & Hofmann, 1993; Tellegen, Watson & Clark, 1999; Zelenski & Larsen, 2000), but the complexity is not very high either. In addition, the structure of

 

Diener *et al.* (1995) contains the most common factors from the different theories about the structure of negative emotions, and this structure was tested with success across three different methods.

First, the structure of Diener *et al.* (1995) will be described, followed by a more detailed description of our research aims and research questions. Next, two studies will be presented, followed by a discussion and some conclusions.

Diener *et al.* (1995) studied the structure of emotions, based on ratings of how often one experiences the emotions under investigation. The resulting correlations are correlations over persons, and, hence, the structure is one of individual differences; it is an emotion trait structure. The structure was obtained upon a selection of a sample of six, commonly accepted emotions, using a screening method based on a number of emotion theories, so that the major emotions that are common across theories were included. Six emotion categories were discerned: Joy, Love, Sadness, Fear, Anger, and Shame. For each of the six emotion categories four terms were chosen. These terms had to be easy to understand and to be able to represent different levels of intensity. In total, 24 emotion words referring to six emotions were selected. A multi-method approach was used: self-report, informant reports, and daily sampling. Using structural equation modelling (SEM) for these data, a structure with six first-order factors (Joy, Love, Fear, Anger, Shame, and Sadness) and two second-order factors (Positive and Negative Affect) was found. Although there seems to be error correlation between indicators associated with a common method, the same general structure was found to apply independent of the method. We will focus on the first-order factors associated with Negative Affect: Fear, Anger, Shame, and Sadness.

We want to investigate two issues regarding the four-dimensional structure. The first issue is whether the structure generalizes over contexts. With the methods used by Diener *et al.* (1995), frequency ratings can be seen as stemming from an aggregate over contexts, while it is unclear to which contexts more specifically the frequencies are referring. We do not see the aggregation as problematic, but we want to investigate whether context-specificity matters, or, in other words, whether the four-dimensional structure generalizes to context-specific data. More in particular, we wanted to check whether the four-dimensional structure generalizes over *single specific situations* from three broad contexts: study/work, personal relationships, and leisure time. The three contexts are quite differentiated although not without overlap. Together they cover most contexts in everyday life. Note that we are interested in the influence the contexts have on the structure of emotions and not on the level of experience of emotions. For example, it is possible that contexts contribute to the variance (large between-context variance), while the within-context correlational structure is the same for all contexts. The issue is whether the correlational structure of emotions is the same in different contexts, or, in other words, whether this correlational structure is situation specific. The issue is *not* how much of the variance in the emotions is induced by the person (trait) or the situation. As we shall have some information about the latter, we shall mention it, although it is not our primary point of interest.

The second issue is whether the four-dimensional structure is comprehensive enough to comprehend the affective aspects expressed in the most frequently used terms for spontaneous expressions of negative affect. Diener *et al.* (1995) have paid attention to the range of the emotion categories and to the selection of the terms within each of these. However, people often express negative emotions using direct terms, not uncommonly idioms or slang terms. These terms are mostly not included in studies on the structure of the emotional domain. Associated with this second issue, our second aim is to study whether or not the four-dimensional structure for negative emotions covers also these terms.

 

In study 1, terms people spontaneously use for the direct expression of negative emotions are gathered. The most frequently used terms will be included in study 2, together with the terms used in the Diener *et al.* (1995) study. In this second study we shall first check for each situation separately and for the data aggregated over the three different kinds of situation per person whether the four-dimensional structure can be replicated when only the terms from Diener *et al.* (1995) are included in the analysis (context-generalizability issue). Next, it will be investigated whether additional factors are needed for the newly gathered terms, and, if not, where in the four-dimensional structure these terms can be located (comprehensiveness issue).

## STUDY 1

### Participants

The participants for this study were 59 18-year-old high-school students (22 males and 37 females) from Flanders, the Dutch-speaking part of Belgium.

### Method

We asked the participants to generate several words and idioms they normally use for the direct expression of negative emotions. They were instructed to list terms for 'the state of feeling bad' and for 'the fact that something is making them feel bad'. This general and double-phrased formulation was chosen because we wanted to gather cause-related as well as non-cause-related terms, to have an as broad as possible elicitation basis for the terms. After the instructions, the participants were requested to write down terms. They were given 10 minutes. The four most frequently mentioned terms were selected, so that an equal number of terms as in the emotion scales of Diener *et al.* (1995) was obtained.

### Results and discussion

The mean number of generated terms per student was 2.10, with a standard deviation of 1.35. The five most common terms and their frequencies are shown in Table 1. Their translation in English is given within parentheses. We do not pretend the translations to cover the exact meaning of the original Dutch terms. The translations are given only to have an indication of the meaning of the Dutch terms. However, as can be noticed, the second term ('pissed') is an American English term that seems quite popular among the senior Flemish high-school students.

The four most frequently mentioned terms will comprise a new scale, called the KAPS scale, an acronym based on the first letter of each term.

Table 1. Terms for 'feeling bad' and their frequencies

| Terms | Frequency |
|---|---|
| Klote (*bloody awful*) | 12 |
| Ambetant (*awkward–irritated*) | 7 |
| Pissed | 7 |
| Slecht gezind (*bad tempered*) | 5 |
| Niet goed (*bad*) | 4 |

 

Although asked for verbal reactions, the participants often mentioned also non-verbal reactions. The most frequent non-verbal reactions were sighing and looking weary. Their frequencies respectively are 8 and 6. The frequent occurrence of non-verbal reactions, although they were explicitly *not* asked for, gives an indication that feeling bad is often expressed using body language and not necessarily using spoken language. Making use of questionnaires, it is extremely difficult to examine this body language. Therefore, the selection was restricted to verbal reactions only.

## STUDY 2

### Participants

The participants of this study were 161 18-year-old high-school students sampled from three different schools, located in Flanders, the Dutch speaking part of Belgium. The sample contained 85 men and 76 women.

### Method

A questionnaire was constructed, in which the participants were asked to describe three recently experienced unpleasant situations, each of them stemming from a different domain of life. The domains included were (i) work or study situation, (ii) personal relationships, and (iii) leisure time. Subsequently, the participants were asked to imagine as vividly as possible what they thought, how they felt, what they wanted to do, etc, in each situation they had just described. Subsequently, they were asked to indicate on a four-point scale (ranging from '0' = not, to '3' = very strong) to what degree they experienced some negative emotions in this situation. Unlike the study of Diener *et al.* (1995), in our study not a frequency rating but an intensity rating was used, because the ratings each refer to one single experienced situation.

The list of negative emotions was taken from Diener *et al.* (1995) and consists of 16 terms organized in four emotion scales, each containing four emotion terms. The first emotion scale is *Fear* and contains the emotion terms *fear*, *worry*, *anxiety*, and *nervous*; the second scale is *Anger* and contains the emotion terms *anger*, *irritation*, *disgust*, and *rage*; the third scale is *Shame* and contains the emotion terms *shame*, *guilt*, *regret*, and *embarrassment*; the fourth scale is *Sadness* and contains the emotion terms *sadness*, *loneliness*, *unhappiness*, and *depression*. In order to obtain an equivalent list in Dutch, the 16 emotion terms were cross-translated twice. First, the authors made a cross-translation using an English–Dutch and a Dutch–English dictionary. Second, two professional bilingual translators (one of whom was a native English speaker) made a cross-translation: the first translated the terms into English; the second translated them back into Dutch. The 16 Dutch emotion terms that were the same in both cross-translations were included in the final Dutch list of emotion terms (see the Appendix for the Dutch terms). The list of emotion terms was immediately followed by the four KAPS-terms selected in study 1. The same response format applies for these terms.

The questionnaires were administered in the schools. The participants were assured the study was anonymous, and they were given 50 minutes to respond. All participants filled out the questionnaires within the time provided.

 

## Results

A total of 441 situation-descriptions were collected; hence, the average person described 2.74 situations.

To examine the influence of the kind of situation on the trait structure of negative emotions, we modelled each term by situation unit as one item. This means that our questionnaire consists of 48 negative emotion items: four negative emotion scales, four terms, three situations. Missing data are handled by pair-wise deletion. Based on a preliminary exploratory factor analysis of the data, we decided to split the Shame scale into a shame–embarrassment and a guilt–regret scale, as they showed up as two separate factors in the exploratory analysis. Hence, from the four-dimensional structure of negative emotions we shift to a five-dimensional structure (SEMs without the split of the Shame scale did not fit our data well).

Testing whether our data contain the five-dimensional structure of negative emotions, as proposed, will be performed with structural equation modelling (SEM) upon polychoric correlations between the items and not on the covariances between the items, as the items are measured on an ordinal four-point scale. For many items, the distribution over the response categories was rather skewed, and the polychoric correlations can deal with this, while assuming an underlying normal distribution. Furthermore, no assumptions are made regarding the interval scale level of the responses. The parameter values of these models will be estimated with *LISREL 8.30* (Jöreskog and Sörbom, 1999) using a maximum likelihood approach, as our number of persons is not that high. Missing data will again be handled by pair-wise deletion; however, case-wise deletion led to similar results. In order to determine the fit of the SEMs we shall use the cut-off values and criteria as proposed by Hu and Bentler (1998, 1999), meaning that a model fits the data if its standardized-root-mean-squared residual (SRMR) is lower than 0.09 and the comparative fit index (CFI) is higher than 0.95. To compare the fit of different models, we shall use Akaike's information criterion (AIC, Akaike, 1977), which is equal to the log likelihood value of the model plus twice the number of parameters. The lower this value, the better the fit of the model. All the models we shall discuss are summarized in Table 2.

First, we tried to fit a model without any situational specificity in the trait structure (model 1). In this structure, all items measuring one emotion were assumed to load on one factor, no matter what kind of situation they were measured in. For example the terms *fear*, *anxiety*, *worry*, and *nervous* in the three kinds of situation are assumed to load on one factor, named Fear. Hence, a structure with five latent factors, each associated with 12 (Fear, Anger, and Sadness) or six emotion terms (Shame–Embarrassment and Guilt-Regret) was obtained. The factor loadings of one emotion term on a negative emotion factor were fixed to be the same over all situations. For example, the loading of *anxiety* on 'Fear' was constrained to be the same in all three kinds of situation. This structure did not fit our data (CFI = 1.00, SRMR = 0.098).

Second, relaxing the assumption of equal paths over the different kinds of situation, we did obtain a fitting model (CFI = 1.00; SRMR = 0.072; model 2). This structure involves a minor situational specificity, as the same traits operate in the three kinds of situation and only the loadings of the terms on these terms differ according to the kind of situation they are measured in.

Third, two models were constructed from the two previous ones, by adding three non-correlating situational factors, each associated with all the items from the corresponding situation. The first model, which is based on model 1, but expanded with three independent

 

Table 2. Summary of fitted structural equation models for negative emotions

| Models | Number of factors | Situational specificity | Fit (AIC) |
|---|---|---|---|
| Model 1: no specificity | 5 | None | No (2563.7) |
| Model 2: loading specificity | 5 | Loadings can depend on the situation | Yes (1433.0) |
| Model 3: no specificity plus situational factors | 8 | Model 1 plus three additional situational factors, no specificity for the first five factors | No (2128.9) |
| Model 4: loading specificity plus situational factors | 8 | Model 2 plus three additional situational factors, loadings on the first five can depend on the situation | No (N.E.) |
| Model 5: situation-specific factors | 15 | Situation-specific emotion factors | Yes (936.2) |
| Model 6: situation-specific factors plus correlation | 15 | As model 5, but with correlations between Shame–Embarrassment and Guilt–Regret | Yes (891.5) |
| Model 7: situation-specific factors with equality constraints | 15 | As model 6, but with equality restrictions on the loadings on similar emotion factor in different situations | No (1989.2) |
| Model 8: situation-specific KAPS factors | 18 | Model 6 plus three additional situational KAPS factors | Yes (1249.3) |
| Model 9: KAPS items loading on the Anger factors | 15 | As model 6, but with the KAPS items loading on the Anger factors | Yes (1284.4) |

N.E., no reliable estimates could be obtained.

situational factors (model 3), nearly fitted the data (CFI = 1.00; SRMR = 0.090). The parameter estimates for this model were very difficult to interpret. The second model (model 4), in a similar way based on model 2, contained too many parameters. Therefore, no reliable parameter estimates could be obtained.

Further, a structure that allows for even more situational specificity was modelled in a model with 15 latent variables, five negative emotion traits for each situation (model 5). The latent variables were allowed to correlate with the other latent variables of the same kind, but measured in another kind of situation. For example, Anger as measured in the study/work situation is allowed to correlate with Anger as measured in leisure time situations and in personal relationship situations, but not with any other latent variables. This model also fitted our data (CFI = 1.00, SRMR = 0.086).

In the next model, model 6, a correlation is allowed between Shame–Embarrassment and Guilt–Regret when measured within the same kind of situation. The reason is that Shame and Guilt are often conceived of as very similar or even as one factor or latent trait (see e.g. Diener *et al.*, 1995; Frijda, 1986; Frijda, Kuipers & ter Schure, 1989; Wierzbicka, 1992). Model 6 also fitted our data (CFI = 1.00, SRMR = 0.085).

Finally, constraining the factor loadings in model 6 so that for similar factors they are equal in the different situations, model 7 is obtained. For example, the loading of *irritation* as measured in situation 1 on the Anger factor of situation 1 is the same as the loading of *irritation* as measured in situation 2 on the Anger factor of situation 2. Model 7 did not fit our data (CFI = 1.00, SRMR = 0.103).

To compare the fitting (or nearly fitting) models, we shall use their AIC values, as mentioned. For model 2, the AIC value is 1433.002. For model 3, the AIC value is equal to 2128.851. For model 5 the AIC value is equal to 936.217, and for model 6 it is equal to

 

891.546. In addition, in model 5 and in model 6 all error variances of the items (situation + emotion term combinations) were lower than those in model 2. Therefore, model 6 was concluded to have the best fit. As the factor loadings of this model were very similar to those of the model with the KAPS-scale included (see later), they will not be shown here, but one can obtain an impression of these loadings by looking at Tables 4–6 and an impression of the correlations between the latent traits by looking at Table 7.

The differences in factor loadings across the three situations can give an impression about the influence of the context on the correlational structure. As these differences turn out to be only minor, also the influence is. This point is also supported by the following two facts: If we correlate the observed correlations with the correlations as reconstructed from the fitted model, a correlation of 0.94 is reached for model 6 (situation-specific structure) and a correlation of 0.92 for model 1 (no situation-specificity), meaning that only 2% extra variance is explained by adding situation-specificity to the model. Second, the correlations of different situations are highly correlated, from 0.94 to 0.97.

The internal consistency of each scale was assessed with Cronbach's alphas. The coefficients for the five emotion scales (and for the KAPS scale) within each kind of situation separately are displayed in Table 3.

Almost all alphas, except twice for Guilt–Regret, were higher than 0.80, so the internal consistency of the scales can be considered as high, taking into account that most scales consist of only four items.

The aim of this study was not only to check whether the four/five- dimensional structure of negative emotions generalizes over data containing a contextual design, but also to find out whether this structure was comprehensive. Therefore we have constructed a scale containing direct expressions of negative emotions (KAPS scale, see study 1). After fitting model 6 with one additional KAPS factor for each kind of situation (model 8: model 6 plus three KAPS factors), it became clear that the KAPS factors correlated highly with the Anger factors (the correlation was higher than 0.72 in each kind of situation). Therefore, a new SEM was constructed analogous to model 6, but with the items of the KAPS scale loading on the Anger factor of the situation they are associated with (model 9: model 6 with the KAPS items loading on Anger factors). Model 9 fitted our data quite well (CFI = 1.00, SRMR = 0.080). The AIC value of model 9 is 1284.413. As this value is almost equal to the AIC value of model 8 (1249.286), and model 9 is more parsimonious, we consider this model 9 as the final model for the total data set.

The factor loadings and error variances of model 9 are shown in Tables 4–6 (per kind of situation), and the intercorrelations between the latent variables are shown in Table 7.

Table 3. Cronbach alpha coefficients for each scale per situation

| | Cronbach's alpha | | |
|---|---|---|---|
| Scale | Situation 1 | Situation 2 | Situation 3 |
| Fear | 0.83 | 0.82 | 0.83 |
| Anger | 0.78 | 0.85 | 0.82 |
| Shame–embarrassment | 0.84 | 0.90 | 0.82 |
| Guilt–regret | 0.67 | 0.68 | 0.51 |
| Sadness | 0.72 | 0.83 | 0.80 |
| KAPS | 0.83 | 0.83 | 0.86 |

Situation 1 = work or study situation, situation 2 = situation wherein personal relationships are involved, and situation 3 = leisure time situation.

 

Table 4. Standardized error variances and factor loadings of negative emotion terms on traits of model 9 in study/work situation

| Situation 1 (Work/study) | Error variance | FEAR 1 | ANGER 1 | SHAME–EMBARR.1 | GUILT–REGRET1 | SADNESS1 |
|---|---|---|---|---|---|---|
| Fear1 | 0.62 | 0.62 | | | | |
| Anxiety1 | 0.55 | 0.67 | | | | |
| Worry1 | 0.71 | 0.54 | | | | |
| Nervous1 | 0.80 | 0.45 | | | | |
| Rage1 | 0.71 | | 0.54 | | | |
| Anger1 | 0.74 | | 0.51 | | | |
| Irritation1 | 0.75 | | 0.50 | | | |
| Disgust1 | 0.82 | | 0.43 | | | |
| Embarrassment1 | 0.62 | | | 0.62 | | |
| Shame1 | 0.56 | | | 0.67 | | |
| Regret1 | 0.75 | | | | 0.51 | |
| Guilt1 | 0.64 | | | | 0.60 | |
| Unhappiness1 | 0.64 | | | | | 0.60 |
| Sadness1 | 0.77 | | | | | 0.48 |
| Loneliness1 | 0.73 | | | | | 0.52 |
| Depression1 | 0.75 | | | | | 0.50 |
| Klote1 *(bloody awful)* | 0.71 | | 0.54 | | | |
| Ambetant1 *(awkward–irritated)* | 0.82 | | 0.43 | | | |
| Pissed1 | 0.63 | | 0.61 | | | |
| Slecht gezind1 *(bad tempered)* | 0.73 | | 0.52 | | | |

Table 5. Standardized error variances and factor loadings of negative emotion terms on traits of model 9 in situations wherein personal relationships are involve

| Situation 2 (personal relationships) | Error variance | FEAR2 | ANGER2 | SHAME–EMBARR.2 | GUILT–REGRET2 | SADNESS2 |
|---|---|---|---|---|---|---|
| Fear2 | 0.58 | 0.65 | | | | |
| Anxiety2 | 0.58 | 0.65 | | | | |
| Worry2 | 0.67 | 0.58 | | | | |
| Nervous2 | 0.85 | 0.39 | | | | |
| Rage2 | 0.66 | | 0.58 | | | |
| Anger2 | 0.70 | | 0.55 | | | |
| Irritation2 | 0.65 | | 0.60 | | | |
| Disgust2 | 0.73 | | 0.52 | | | |
| Embarrassment2 | 0.58 | | | 0.65 | | |
| Shame2 | 0.53 | | | 0.69 | | |
| Regret2 | 0.78 | | | | 0.47 | |
| Guilt2 | 0.53 | | | | 0.69 | |
| Unhappiness2 | 0.61 | | | | | 0.62 |
| Sadness2 | 0.71 | | | | | 0.54 |
| Loneliness2 | 0.62 | | | | | 0.62 |
| Depression2 | 0.69 | | | | | 0.56 |
| Klote2 *(bloody awful)* | 0.74 | | 0.51 | | | |
| Ambetant2 *(awkward–irritated)* | 0.81 | | 0.44 | | | |
| Pissed2 | 0.63 | | 0.61 | | | |
| Slecht gezind2 *(bad tempered)* | 0.71 | | 0.54 | | | |

Table 6. Standardized error variances and factor loadings of negative emotion terms on traits of model 9 in leisure time situation

| Situation 3 (leisure time) | Error variance | FEAR3 | ANGER3 | SHAME–EMBARR.3 | GUILT–REGRET3 | SADNESS3 |
|---|---|---|---|---|---|---|
| Fear3 | 0.56 | 0.67 | | | | |
| Anxiety3 | 0.61 | 0.62 | | | | |
| Worry3 | 0.62 | 0.62 | | | | |
| Nervous3 | 0.82 | 0.43 | | | | |
| Rage3 | 0.66 | | 0.59 | | | |
| Anger3 | 0.66 | | 0.59 | | | |
| Irritation3 | 0.68 | | 0.56 | | | |
| Disgust3 | 0.83 | | 0.41 | | | |
| Embarrassment3 | 0.60 | | | 0.63 | | |
| Shame3 | 0.58 | | | 0.65 | | |
| Regret3 | 0.88 | | | | 0.34 | |
| Guilt3 | 0.57 | | | | 0.65 | |
| Unhappiness3 | 0.61 | | | | | 0.63 |
| Sadness3 | 0.65 | | | | | 0.59 |
| Loneliness3 | 0.66 | | | | | 0.58 |
| Depression3 | 0.65 | | | | | 0.59 |
| Klote3 *(bloody awful)* | 0.71 | | 0.54 | | | |
| Ambetant3 *(awkward–irritated)* | 0.80 | | 0.45 | | | |
| Pissed3 | 0.61 | | 0.62 | | | |
| Slecht gezind3 *(bad tempered)* | 0.68 | | 0.56 | | | |

Table 7. Estimated correlations (and their standard error) between latent negative emotion factors of model 9

| | FEAR1 | FEAR2 | FEAR3 | ANGER1 | ANGER2 | ANGER3 |
|---|---|---|---|---|---|---|
| FEAR1 | 1 | | | | | |
| FEAR2 | 0.27 | 1 | | | | |
| FEAR3 | 0.19 | | 0.11 | 1 | | |
| ANGER1 | | | | 1 | | |
| ANGER2 | | | | 0.49 | 1 | |
| ANGER3 | | | | 0.57 | 0.43 | 1 |
| | SHAME–EMB.1 | SHAME–EMB.2 | SHAME–EMB.3 | GUILT–REGRET1 | GUILT–REGRET2 | GUILT–REGRET3 |
| SHAME–EMB.1 | 1 | | | | | |
| SHAME–EMB.2 | 0.25 | 1 | | | | |
| SHAME–EMB.3 | 0.12 | 0.36 | 1 | | | |
| GUILT–REGRET1 | 0.55 | | | 1 | | |
| GUILT–REGRET2 | | 0.51 | | 0.35 | 1 | |
| GUILT–REGRET3 | | | 0.29 | 0.33 | − 0.01 | 1 |
| | SADNESS1 | SADNESS2 | SADNESS3 | | | |
| SADNESS1 | 1 | | | | | |
| SADNESS2 | 0.30 | 1 | | | | |
| SADNESS3 | 0.39 | 0.36 | 1 | | | |

The kind of situation is denoted as follows: 1 = study/work, 2 = personal relationships, 3 = leisure time.
Not mentioned correlations are zero.

 

## Discussion

We had two issues to be investigated: (i) whether the four-dimensional negative-emotion-trait structure generalizes over single specific situations from different contexts and (ii) whether this four-dimensional structure is comprehensive enough to capture direct expressions of negative affect. These two issues will be discussed subsequently.

First, in all our final models the Shame factor was split up into a Guilt–Regret and Shame–Embarrassment factor. Therefore, we end up with a five-dimensional structure instead of a four-dimensional one, but the Guilt–Regret and the Shame–Embarrassment factors show positive correlations. Several explanations can be given for the split. First, it can be related to the cross-cultural findings that the relations between Shame and Guilt are not very stable over cultures. The two sometimes emerge as one cluster, sometimes as two separate clusters, and sometimes they show up in clusters such as Fear or Sadness (see e.g. Shaver, Swartz, Kirson & O'Connor, 1987; Shaver Wu & Swartz, 1992; Fontaine, Poortinga, Setiadi & Suprapti, 1996). As we did our research on a different continent (Western Europe instead of the US), the differences with the proposed four-dimensional structure can reflect possible cross-cultural differences in the organization of the emotion domain. Second, the language in our study is different from that in the study of Diener *et al.* (1995) (Dutch versus US English). It may be the case that the translated terms we used do not completely match the original terms and do not cover the same emotional experience. Third, the difference may also be the result of the specific methodology used in the different studies. As we used a different methodology from Diener *et al.* (1995), with context-specific data and with intensity ratings instead of frequency ratings, this explanation may also apply.

Second, for each situation, we obtained about the same five-dimensional structure. Furthermore, all factors are also positively correlated with their equivalents in the other situations, except for Guilt–Regret in the personal relationship situation versus Guilt–Regret in the leisure time situation. These positive correlations contradict the independence of the situational factors of the same type. Given these inter-situation correlations, we can conclude that traits and situations both do matter. Situations further specify the meaning of traits and are therefore important, even when constructing trait questionnaires (Deinzer *et al.*, 1995; Eid *et al.*, 1994; Steyer, Schmitt & Eid, 1999; Ten Berge & De Raad, 1999). The negative emotion factors here can be seen as specific instantiations of traits within a certain situation. Hence, we do not assume that there are different emotion factors per situation. Instead, the same trait structure holds; only small differences were found. This point is in line with the finding that adding situation specificity (model 6 versus model 1) only 2% extra variance is explained, and with the high correlations between the correlations from the different situations.

The correlations between similar emotion factors in different situations were moderately positive (varying from $-0.01$ to 0.57, with a mean value of 0.30). These values are similar to the cross-situational consistency coefficients of behaviour and to the trait–behaviour correlations found by Mischel (1968, 1984) and Mischel and Peake (1982), which are moderately positive, but seldom larger than 0.30. Therefore, our results are in line with a situational trait concept. Second, we performed a variance component analysis per emotion scale with the three situations (fixed effect) and the persons (random effect) as factors (Endler, 1966). In each analysis, the person main effect was responsible for 34–46% of the variance, the situation main effect for 0–6% and the error together with the interaction between persons and situations for 52–63%. It can be concluded that the

 

main part of the variance is caused by the interaction between the persons and situations together with some error. Therefore, the correlations between similar emotion factors across different situations are not that high: the effect of the persons is less than the combined effect of the interaction and the error. Hence, the affective response is rather situation-specific (remember that this is unrelated to the situation specificity of the structures), which is natural given that depending on the person another specific instantiation for the type of situation is chosen: each person described his/her own three situations. This adds to the person by type of situation interaction and detracts from the relative contribution of the person main effect and therefore also from the correlation. Even so, the correlational structure is quite stable over situations, which is not a contradiction (see earlier).

Remember that it was *not* our aim to determine how and how much traits and situations contribute to emotional responses. This is an important and interesting issue, but our question is whether the structure generalizes over situations. The answer is 'yes', so we can use the 16 terms also to measure negative emotions for quite different specific situations and trust that the subscales apply. The only modification is that two scores are needed for the Shame subscale, because of the split of the corresponding factor.

A possibility to investigate the contribution of situations and traits to emotional responses is the latent state-trait theory (LST theory) as described by Steyer *et al.* (1999). To apply this theory, one needs at least two measures of one trait at one time point (for example by splitting the test by half) and these measurements need to be repeated at least once. For our application, this would imply two measures within the same situation. With this approach, one can separate the pure trait influences from the influences of the situation and the trait–situation interactions, within a SEM framework. However, as explained, it is not our aim to study the effect of situations and traits, but just to check the generalizability of a structure. Furthermore, our subscales are too short to be split into two halves: for example, for the Shame–Embarrassment scale, only one item would remain per half scale.

In conclusion to the structure generalizability issue, two kinds of situational specificity seem to occur. First, each situation seems to have its own five emotion factors, meaning that the emotions in different situations are at most only moderately correlated. Second, depending on the situations, the specific emotion terms have slightly different loadings, meaning that the quality of an emotion is slightly different from one situation to another.

The second aim of our study was to look for the comprehensiveness of the list of negative emotions by including a scale containing four spontaneous, direct expressions of negative affect. Therefore, we added a scale containing direct expressions of negative affect (KAPS scale). Including this scale did not alter the overall structure nor did it alter the structure within each situation, since the KAPS scale items were primarily related to Anger. This finding is interesting because the terms included in this KAPS scale are generated as normally used terms for negative affect. They do not come from experts but from laypersons. Furthermore, the instructions were very open and general. For all these reasons, it did not seem unlikely that these terms would form one or more separate dimensions. However, they did not, but instead they were very much like Anger. Therefore, there is no indication that our structure does not sufficiently cover the aspects of negative affect as experienced in commonly used terms.

If people directly express negative affect, most of the time they express something that is associated with or at the basis of anger, as the KAPS scale is found to be highly related to the Anger factor. This result is in line with Anger being the scale with the highest mean score ($p < 0.01$). Since people were free in selecting the specific negative situations they

 

would describe, selecting anger situations seems to be their spontaneous inclination. This also explains that the terms they chose to express negative emotions turn out to be terms associated with Anger. The prominence of Anger and Anger-related findings is perhaps to be attributed to the action-directed nature of anger (Averill, 1983; Berenbaum *et al.*, 1995; Berkowitz, 1990; Deffenbacher *et al.*, 1996; Fitness & Fletcher, 1993; Frijda, 1986), which generalizes to the questionnaire situation of our study. Shame in contrast has a significantly lower mean score than all other emotion factors ($p < 0.01$). Perhaps this is because shame includes a tendency to hide oneself from others (Barrett, 1995; Gilbert, Pehl & Allan, 1994; Lindsay-Hartz, 1984; Lindsay-Hartz, De Rivera & Mascolo, 1995; Tangney, 1995), which does not stimulate one telling about it. To a lesser extent, Fear, Sadness, and Guilt are also not emotions to feel proud of, and therefore they might have been less prominent in our study.

## Conclusions

The structure of negative emotion traits, as we found it, is five dimensional instead of four dimensional, and it generalizes over the different kinds of situation, so the corresponding scales can also be used for the assessment of emotions in quite different specific situations. However, some situational differences were found, implying that traits pick up some qualitative specificity within a given situational context.

Second, the KAPS scale did not alter the general structure, but could be explained by the Anger factor instead. Therefore, we may conclude that the five-dimensional structure is rather comprehensive, taking into account the methodology used.

## APPENDIX. THE DUTCH EMOTION TERMS

Fear:

- Vrees (Fear)
- Angst (Anxiety)
- Ongerust (Worry)
- Zenuwachtig (Nervous)

Anger:

- Razend (Rage)
- Boosheid (Anger)
- Irritatie (Irritation)
- Walging (Disgust)

Sadness:

- Ongelukkig (Unhappiness)
- Bedroefdheid (Sadness)
- Eenzaam (Loneliness)
- Depressie (Depression)

Shame:

- Gêne (Embarrassment)
- Schaamte (Shame)

 

- Schuld (Guilt)
- Spijt (Regret)

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