



Components of Emotional Meaning: A sourcebook

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CHAPTER

15 From meaning to experience: The dimensional structure of emotional experiences

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Abstract

In this chapter, it is investigated to what extent the psycholinguistic results of the GRID can be generalized to the actual emotional experiences of people. In the present study a sample of adults reported on the most intense emotional episode of the day, freely labeled these episodes with three emotion terms, and then rated to what extent 137 GRID features described their emotional experience. For the 95 most reported terms the average empirical feature profile was computed and analyzed in exactly the same way as the GRID data. A very comparable four-dimensional VALENCE, POWER, AROUSAL, and NOVELTY structure was identified for the emotional experiences. The results clearly indicate that the findings with the GRID instrument are not only relevant for (psycho)linguistic approaches, but also interesting for the study of actual emotion episodes.

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The design of the GRID study has been informed by two long-standing traditions of psycholinguistic research on emotion words, and more broadly on affective information. The first tradition directly investigated the cognitive representation of emotions by studying the perceived similarity between emotion words (e.g., Ekman, 1955; Shaver, Schwartz, Kirson, & O'Connor, 1987). The second tradition focused on the connotative meaning dimensions in language by having nouns rated on a representative sample of bipolar adjectives (e.g., Osgood, May, & Miron, 1975; Osgood, Suci, & Tannenbaum, 1957). Both approaches have identified three dimensions across cultural and linguistic groups, namely evaluation or VALENCE, potency or POWER, and activation or AROUSAL in the affective domain. The GRID study subsumes both traditions. On the one hand, it works with single emotion words like in the word similarity tradition. On the other hand, these emotion words are rated on features like in the connotative meaning tradition. Most importantly, the contribution of the GRID paradigm is that it is grounded in a strong theoretical framework. The features to be rated have been

systematically chosen on the basis of the Component Process Model (CPM), which assumes that an emotion episode consists of a certain degree of synchronization between five basic subsystems of human functioning, namely Appraisals, Bodily reactions, Expressions, Action tendencies, and Feelings (e.g., Scherer, 2005a; see also Chapter 1 and Chapter 5). The GRID study confirms that VALENCE, POWER, and AROUSAL, which were already identified by these two earlier traditions, are the three most important dimensions of the emotion space. Moreover, it finds evidence for a fourth dimension—NOVELTY—which explains less variance, but also occurs reliably across cultures (Fontaine, Scherer, Roesch, & Ellsworth, 2007; see Chapter 7). Although the GRID study takes a more psychological approach, it remains essentially a psycholinguistic study. It is limited to the investigation of the shared cognitive representation of the meaning of emotion words among native speakers, rather than studying episodes of actual emotional experiences.

p. 244 The central question of the current chapter is whether, and to what extent, the meaning structure (i.e., semantic structure) of the emotion domain mirrors the underlying experience structure of the emotion domain. Can the daily experiences that people label with emotion terms be represented by the same four dimensions of VALENCE, POWER, AROUSAL, and NOVELTY? The lexical sedimentation hypothesis would indeed predict such a correspondence (e.g., John, Angleitner, & Ostendorf, 1988; Saucier & Goldberg, 1996). According to this hypothesis, psychological experiences precede the emergence of words in language. It hypothesizes that recurrent psychological experiences that are of significance for human interaction get encoded in language to facilitate communication about these experiences. Thus, from the perspective of the lexical sedimentation hypothesis, emotion words and their associated meaning structure represent the structure of the actual emotional experiences.²

This prediction from the lexical sedimentation hypothesis seems to be disconfirmed by the existing empirical research on emotional experiences. It is common practice in psychological emotion research to ask people to describe their emotional experiences by using emotion words (e.g., *sad* and *afraid*) and feeling words that describe the general quality of the emotional experience (e.g., *good* and *weak*). The four most widely used models that use this approach have only identified a two-dimensional structure, rather than a three or even a four-dimensional structure, as would be expected on the basis of the lexical sedimentation hypothesis. The first model, the positive affect–negative affect model (e.g., Watson & Tellegen, 1985), claims that positive and negative affect are two unipolar dimensions that are virtually uncorrelated, rather than the opposite poles of a single VALENCE dimension. Moreover, the model assumes that both dimensions reflect two separate psychobiological mechanisms. In consequence, this tradition supposes a strong difference between meaning and psychological experience. The second and the third model, namely the pleasure–AROUSAL model (e.g., Russell, 1980) and the pleasantness–activation model (e.g., Larsen & Diener, 1992), partially correspond with psycholinguistic approaches. Both models assume a first bipolar VALENCE dimension and a bipolar AROUSAL dimension. According to these models, however, neither the POWER nor the NOVELTY dimension are needed to represent emotional experiences. The fourth model, the tense AROUSAL and energetic AROUSAL model (e.g., Thayer, 1989), takes again a very different stance: it does not assume a VALENCE dimension, but instead supposes that the psychological experience of emotions is based on two AROUSAL systems.

Although these four affect models differ fundamentally in the conceptualization of the dimensions that span the psychological experience of emotions, it has been empirically demonstrated that they are psychometrically equivalent, basically differing only with respect to the rotation of the dimensions in the two-dimensional space (Yik, Russell, & Feldman Barrett, 1999; see also Chapter 2 for a more detailed account). There is thus convergent evidence for a VALENCE–AROUSAL structure (or different rotations thereof) in the psychological emotion and affect literature. The results obtained in this work thus seem to indicate that daily emotional experiences differ systematically from one another only in terms of VALENCE and AROUSAL, but not in terms of POWER or NOVELTY.

The fact that only the two dimensions of VALENCE and AROUSAL (or a rotation of these dimensions) are found in current empirical research on emotional experiences is insufficient to reject the lexical sedimentation

hypothesis, which predicts that also the POWER and the NOVELTY dimensions are needed to represent the actual emotional experiences. There are many different methodological factors that can potentially account for the observed differences between meaning and experience studies in the literature. In the present chapter we focus on three such methodological factors. The most obvious methodological explanation for the observed differences is the type of selection of emotion words for the assessment of emotional experiences. It can indeed be observed that the terms that are typically used in psycholinguistic emotion research and in psychological affect research are often only partially overlapping. In psychological affect research, feeling words that represent the general quality of the emotional experience (such as *good* or *bad* and *weak* or *strong*) are frequently used, while psycholinguistic emotion research is much more restricted to prototypical emotion words (such as *anger* and *fear*). Moreover, early on Russell (1991a) hypothesized that POWER would be the second dimension in similarity research if predominantly interpersonal emotion terms were used, and AROUSAL would be the second dimension if predominantly intrapersonal emotion terms were used.

Another obvious explanation is unreliability of the data. Unreliability reduces the likelihood of identifying smaller dimensions in a dataset. As demonstrated in Chapter 14, the fourth NOVELTY dimension can also be identified with perceived similarity ratings between emotion words if the perceived similarities are reliably measured. It could be hypothesized that more sources of unreliability play a role in experience than in meaning research. For instance, interindividual differences in the understanding of emotion terms will introduce unreliability in both types of research, but interindividual differences in the accuracy of the conscious representation of one's ongoing emotional experience will only affect experience research.

A third methodological explanation is provided by the way in which the dimensions have been interpreted. In the existing similarity and experience research, the dimensions only reflect the associations between emotion terms. Such research gives no insight into why these associations emerge. There is no additional simultaneous information available about the underlying emotion processes that can confirm or falsify the interpretation of the dimensions. It is thus very well possible that there is more convergence on the nature of the underlying dimensions in meaning and experience research than is suggested by the labels used in both types of research. The GRID paradigm lends itself very well to investigate this last methodological account. In the GRID study, the dimensional representation of emotion words is identified on the basis of their reference to the underlying emotion processes. The dimensions do not only derive their meaning from the position of the emotion terms in the geometrical representation, but as well from the emotion features that define these dimensions. For instance, in the GRID study the first dimension is not only interpreted as a VALENCE dimension because positively and negatively valenced emotion terms are opposed on this dimension (e.g., *joy* and *anger*), but because this dimension is defined by Appraisals (e.g., intrinsically pleasant), Bodily experiences (e.g., felt warm), Expressions (e.g., frown), Action tendencies (e.g., wanting to sing and dance), and Feelings (e.g., felt bad) that define VALENCE (see Chapter 7). Thus, before it can be concluded that there is a fundamental difference between the meaning structure of emotion words and the experience structure of emotions, it has to be demonstrated that the dimensions in both approaches indeed do not refer in the same way to Appraisals, Bodily reactions, Expressions, Action tendencies, and Feelings.

In the present study, the experience structure of the emotion domain is investigated by using the GRID paradigm. Special attention is given to the three methodological issues that might have caused the observed divergence between research on the meaning structure and research on the experience structure of emotions, namely (1) to the selection of emotion terms and feeling terms that describe the general quality of the emotional experience, (2) to the reliability of the assessment of emotional experiences, and (3) to the interpretation of the experience dimensions in terms of the underlying emotion processes.

15.1 Method

Participants

Second-year bachelor students in psychology received course credits for participating in the research, as well as for asking two adult, non-student acquaintances to participate. Both students and acquaintances participated on a free and anonymous basis. In total, 964 Dutch-speaking Belgian adults between 19 and 56 years ($M_{\text{age}} = 31.28$ years) completed the study (62.24% women). Most participants described four emotional episodes, but some reported only three or two. In total, 3648 emotion episodes were described.

Procedure

All participants logged on a protected website five times during nine days. On the first day, they were asked to give demographic background information and to fill out questionnaires on general emotional functioning (such as alexithymia). The latter information is not used in the current chapter which is focused on the use of emotion words to describe actual emotional experiences. Subsequently, participants were asked to report, each second day, the most important emotional experience of that day.

Instrument

The instrument used to assess the most important emotional experience of the day consisted of two parts. First, on a web questionnaire the participants were asked to describe the recalled emotional episodes, qualitatively (e.g., where it happened, who was present, how they reacted in the situation) in order to make the recollection of the event as vivid as possible. Moreover, they were asked to generate three labels that best represented their emotions and feelings during each of the episodes. Both “emotions” and “feelings” were mentioned in the instructions to allow for a comparison with the existing psychological research on emotional experiences, which also uses both types of terms. Only the qualitative emotion and feeling labels of the first part are further analysed in the current chapter. Second, they were asked to rate to what extent 137 emotion features³ stemming from the GRID instrument (see Chapter 5; Fontaine et al., 2007) represented their own emotional experience on a 7-point bipolar scale (1 = *completely disagree*, 7 = *completely agree*). The features referred to Appraisals, Bodily reactions, Expressions, Action tendencies, and Feelings.

15.2 Results

The qualitatively reported emotion and feeling labels in each episode were first coded into emotion categories based on the word stem of the main word in each response. All words that shared the same stem and the same meaning, like *blijheid*, *blijdschap*, and *blij* (which all mean joy), were coded into a single category. All terms that were mentioned in at least 18 episodes (which corresponds to about 0.5% of the reported episodes) were selected for further analyses, which resulted in a total of 95 emotion and feeling terms (see Table 15.1). Eleven emotion terms were reported in more than 5% of the episodes, namely *blijheid* (joy), *geluk* (happiness), *verdriet* (sadness), *frustratie* (frustration), *kwaadheid* (anger), *opluchting* (relief), *boosheid* (anger), *angst* (fear), *woede* (rage), *tevredenheid* (contentment), and *teleurstelling* (disappointment).

Table 15.1 Frequency of emotion words used to label the emotional experiences and reliability (Cronbach's alpha) of the corresponding componential experience profiles

Dutch emotion words	English translation	N	Cronbach's alpha
blijheid	joy	625	1.00
geluk	happiness	437	1.00
verdriet	sadness	326	0.99
frustratie	frustration	309	0.99
kwaadheid	anger	272	0.99
opluchting	relief	256	0.99
boosheid	anger	250	0.99
angst	fear	248	0.99
woede	rage	227	0.99
tevredenheid	contentment	209	0.99
teleurstelling	disappointment	196	0.98
vreugde	delight	171	0.99
onmacht	incapacity	168	0.98
ergernis	annoyance	166	0.98
trots	pride	148	0.99
machteloosheid	powerlessness	145	0.98
ontgoocheling	disillusionment	144	0.98
rust	quietness	142	0.99
irritatie	irritation	138	0.98
voldoening	satisfaction	132	0.99
verrassing	surprise	120	0.99
medeleven	sympathy	116	0.98
ongeloof	disbelief	115	0.97
verbazing	astonishment	109	0.97
opwinding	excitement	106	0.98
liefde	love	103	0.99
schuld	guilt	102	0.97
medelijden	compassion	98	0.97
ontspanning	relaxation	99	0.99

spanning	tension	96	0.97
moeheid	tiredness	92	0.94
plezier	pleasure	85	0.99
stress	stress	84	0.96
zenuwachtigheid	agitation	84	0.95
ontroering	being moved	76	0.98
onzekerheid	uncertainty	73	0.96
droefheid	sorrow	72	0.95
bezorgdheid	concern	71	0.97
nervositeit	nervousness	70	0.95
schaamte	shame	70	0.94
spijt	regret	66	0.94
onbegrip	incomprehension	65	0.96
twijfel	doubt	63	0.95
vrolijkheid	gaiety	62	0.98
verliefdheid	being in love	60	0.98
ongerustheid	worry	58	0.95
warmte	warmth	59	0.98
fierheid	pride	58	0.98
genot	enjoyment	55	0.98
verwarring	confusion	58	0.94
enthousiasme	enthusiasm	57	0.98
goed gevoel	good feeling	57	0.98
tristheid	dejection	55	0.93
verlangen	longing	54	0.96
verwondering	amazement	52	0.94
gemis	to miss	51	0.89
nieuwsgierigheid	curiosity	51	0.96
euforie	euphoria	47	0.97
geschrokken zijn	being startled	46	0.94
ongeduldigheid	impatience	46	0.94
verontwaardiging	indignation	47	0.96

vriendschap	friendship	45	0.98
eenzaamheid	loneliness	44	0.93
tederheid	tenderness	43	0.97
genegenheid	affection	42	0.98
schrik	terror	42	0.90
hoop	hope	41	0.93
pijn	pain	41	0.88
paniek	panic	40	0.95
ongemak	discomfort	39	0.91
kalmte	calmness	36	0.95
onrust	unrest	34	0.90
verveling	boredom	34	0.90
verveeldheid	being bothered	33	0.90
energiek	energy	29	0.97
verbondenheid	solidarity	28	0.96
vrijheid	freedom	28	0.96
opgewektheid	cheerfulness	27	0.97
opgejaagdheid	being routed	26	0.92
vertrouwen	trust	26	0.96
zorgeloosheid	carefreeness	26	0.97
bewondering	admiration	25	0.89
gezelligheid	cosiness	24	0.97
bangheid	fear	23	0.82
dankbaarheid	gratitude	22	0.92
geruststelling	reassurance	21	0.93
hulpeloosheid	helplessness	21	0.89
samenhorigheid	being together	21	0.96
verlegenheid	shyness	21	0.84
wanhoop	despair	21	0.85
vredigheid	peacefulness	20	0.96
jaloerie	jealousy	19	0.83
amusement	amusement	18	0.94

interesse	interest	18	0.95
opgetogenheid	elation	18	0.94

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↳

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Subsequently, we computed, for each emotion and feeling term, the corresponding experienced feature profile across the 137 GRID features. The average of the features was computed across all episodes in which the respective emotion or feeling term was spontaneously used to describe the experience. The reliability of the profile of each term was investigated by means of a Cronbach's alpha with the 137 features being treated as observations and the experiences that were labeled with that term as the variables. The reliability of the average experience profiles ranged from 0.82 to 1.00 with an average of 0.95 (see also Table 15.1).

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The experience structure was investigated on the average feature profiles of the 95 terms, namely on a matrix with 137 columns corresponding to the 137 GRID features, and 95 rows corresponding to the 95 emotion terms that were used in at least 18 episodes. A factor analysis (Principal Component Analysis) was executed on the 137 GRID features across the 95 emotion terms. The scree plot pointed to four factors with the first ten Eigenvalues being 71.407, 13.793, 9.040, 6.707, 3.998, 3.526, 3.015, 2.570, 2.117, and 1.875 (see also Figure SM 1⁴). The four-factor solution accounted for 73.68% of the total variance.

The four-factor experience structure was orthogonally Procrustes rotated toward the GRID meaning structure (see Table 15.2). The congruence measures (Tucker's phi) were 0.90 with the VALENCE meaning factor, 0.86 with the POWER meaning factor, 0.86 with the AROUSAL meaning factor, and 0.59 with the NOVELTY meaning factor. As the congruence coefficients only exceeded the value of 0.85 for the first three factors, only these factors could be considered reasonably congruent (Fischer & Fontaine, 2011). The first experience factor is labeled EXPERIENCE VALENCE. This factor opposes negative to positive valenced features (Appraisals, Feelings, Action tendencies, Bodily reactions, and Expressions). The second experience factor is labeled EXPERIENCE POWER. On this factor especially, expressions of high and low POWER are opposed to one another. The label of the third experience factor is EXPERIENCE AROUSAL. This factor opposes absence of bodily reactions and absence of expressions to sympathetic AROUSAL features. As the fourth factor was clearly not congruent between the meaning and the experience structure, this factor was further explored. Despite the low congruence, the highest loading features were still the appraisals "unpredictable" and "suddenly" and the facial expressions "had the jaw drop," "opened her or his eyes widely," and "had eyebrows go up," which does point to a clear NOVELTY component in this fourth factor. The three features that differed most between the meaning and the experience structure were "felt an urge to be attentive to what is going on," which only defined the fourth factor in the experience structure; "experienced the emotional state for a long time," which only defined the negative pole of the fourth factor in the meaning structure; and "wanted to take care of another person or cause," which only defined the fourth factor in the experience structure. Only the last feature conceptually changed the meaning of the last experience factor.

Table 15.2 Factor loadings of GRID features in four-factorial experience structure after orthogonal Procrustes rotation toward GRID meaning structure

GRID features	EXPERIENCE VALENCE	EXPERIENCE POWER	EXPERIENCE AROUSAL	EXPERIENCE NOVELTY/CARE
smiled	0.97	0.18	−0.06	−0.09
felt positive	0.97	0.19	−0.11	−0.06
wanted to get totally absorbed in the situation	0.97	0.08	−0.01	−0.06
in itself pleasant for the person	0.97	0.17	−0.09	−0.07
consequences positive for person	0.96	0.18	−0.05	−0.14
felt good	0.96	0.19	−0.11	−0.08
wanted to submit to the situation as it is	0.95	−0.09	−0.15	−0.04
felt at ease	0.95	0.17	−0.20	−0.08
in itself pleasant for somebody else	0.94	0.21	−0.10	−0.07
consequences positive for somebody else	0.93	0.21	−0.06	−0.12
wanted to be tender, sweet, and kind	0.91	−0.20	−0.14	0.17
felt in control	0.91	0.27	−0.16	−0.07
felt strong	0.91	0.35	−0.07	−0.07
wanted to sing and dance	0.91	0.19	0.11	−0.12
muscles relaxing (whole body)	0.87	−0.06	−0.22	−0.14
wanted to be near or close to people or things	0.86	−0.11	−0.09	0.18
felt energetic	0.86	0.45	0.03	−0.07
felt calm	0.85	0.00	−0.42	−0.01
moved toward people or things	0.78	0.33	0.18	0.07
consequences able to live with	0.77	0.27	0.17	−0.15
important and relevant for person's goals	0.75	0.23	0.05	−0.29
caused intentionally	0.75	0.35	−0.06	−0.15
felt powerful	0.73	0.49	0.09	−0.20
caused by the person's own behavior	0.72	0.14	0.16	−0.46
familiar	0.67	0.17	−0.26	−0.45
wanted to be seen, to be in the center of attention	0.66	0.39	0.24	−0.20
confirmed expectations	0.65	0.06	−0.36	−0.44

important and relevant for goals of somebody else	0.57	0.31	−0.06	0.29
breathing slowing down	0.56	−0.42	−0.29	−0.19
wanted to comply to someone else's wishes	0.55	0.04	0.13	0.09
consequences predictable	0.48	0.20	−0.12	−0.44
wanted to hand over the initiative to someone else	0.40	−0.06	0.03	0.11
inconsistent with expectations	−0.51	0.19	0.36	0.31
hid the emotion from others by smiling	−0.53	−0.13	0.19	−0.22
moved against people or things	−0.55	0.02	0.36	−0.20
felt weak limbs	−0.57	−0.54	0.45	−0.10
suddenly	−0.57	−0.15	0.39	0.51
produced a short utterance	−0.57	−0.09	0.34	0.30
wanted to take initiative her/himself	−0.58	0.49	0.24	−0.16
had a trembling voice	−0.64	−0.51	0.45	0.11
produced speech disturbances	−0.65	−0.32	0.54	0.06
in danger	−0.67	−0.13	0.53	0.06
required an immediate response	−0.68	0.13	0.46	0.36
got pale	−0.68	−0.48	0.41	0.05
wanted to make up for what she or he had done	−0.69	−0.11	0.28	−0.17
felt tired	−0.70	−0.23	−0.04	−0.50
felt cold	−0.70	−0.54	0.18	0.07
had stomach troubles	−0.72	−0.41	0.29	−0.09
lacked the motivation to pay attention to what was going on	−0.73	−0.34	0.01	−0.40
wanted to disappear or hide from others	−0.73	−0.37	0.35	−0.24
withdrew from people or things	−0.74	−0.36	0.21	−0.30
had eyebrows go up	−0.75	0.19	0.21	0.41
showed the emotion to other less than s/he felt it	−0.75	−0.25	0.28	0.06
muscles tensing (whole body)	−0.76	−0.05	0.56	−0.02
consequences avoidable or modifiable	−0.76	0.19	0.31	−0.23
lacked the motivation to do anything	−0.77	−0.41	0.03	−0.29
wanted to withdraw into her/himself	−0.77	−0.49	0.21	−0.21

felt submissive	-0.78	-0.29	0.20	-0.30
felt exhausted	-0.79	-0.26	0.10	-0.36
wanted to be hurt as little as possible	-0.79	-0.32	0.32	-0.13
tried to control the intensity of the emotional feeling	-0.79	-0.15	0.29	0.10
wanted to run away in whatever direction	-0.81	-0.22	0.35	-0.26
wanted to flee	-0.81	-0.28	0.34	-0.27
felt nervous	-0.81	-0.03	0.46	-0.04
wanted to overcome an obstacle	-0.81	0.13	0.30	-0.10
wanted to prevent or stop sensory contact	-0.82	-0.23	0.28	-0.11
irrevocable loss	-0.82	-0.38	0.18	0.07
wanted to destroy whatever was close	-0.83	0.01	0.16	-0.19
wanted to do damage, hit, or say something that hurts	-0.84	0.10	0.10	-0.09
wanted to tackle the situation	-0.85	0.26	0.17	0.04
wanted to keep or push things away	-0.85	-0.27	0.30	-0.17
wanted to break contact with others	-0.85	-0.15	0.23	-0.24
treated unjustly	-0.86	0.12	0.22	-0.03
felt weak	-0.86	-0.40	0.21	-0.08
violated laws or socially accepted norms	-0.87	0.08	0.16	0.16
wanted to be in command of others	-0.87	0.20	0.18	-0.05
felt restless	-0.88	-0.03	0.36	-0.07
felt out of control	-0.89	-0.18	0.34	-0.06
pressed lips together	-0.90	-0.15	0.17	0.06
wanted someone to be there to provide help or support	-0.90	-0.22	0.23	0.00
wanted to be in control of the situation	-0.91	0.08	0.27	-0.13
wanted to oppose	-0.92	0.03	0.18	-0.01
consequences negative for somebody else	-0.93	-0.08	0.09	0.19
frowned	-0.93	0.00	0.06	0.14
felt powerless	-0.93	-0.26	0.11	0.12
felt inhibited or blocked	-0.93	-0.23	0.24	-0.07
felt bad	-0.94	-0.26	0.14	0.02
in itself unpleasant for somebody else	-0.95	-0.10	0.07	0.16

incongruent with own standards and ideals	-0.96	-0.01	0.10	0.04
consequences negative for person	-0.96	-0.14	0.18	-0.01
felt negative	-0.96	-0.17	0.13	-0.05
in itself unpleasant for the person	-0.97	-0.16	0.11	0.02
felt dominant	0.03	0.82	0.15	-0.13
had an assertive voice	0.50	0.72	-0.08	-0.03
felt an urge to be active, to do something, anything	0.11	0.69	0.31	0.01
increased the volume of voice	-0.19	0.65	0.48	0.05
felt alert	0.09	0.64	0.29	0.24
wanted to move	0.37	0.55	0.34	-0.28
wanted to show off	0.26	0.42	0.31	-0.17
showed the emotion to others more than s/he felt it	0.29	0.39	-0.01	0.06
produced a long utterance	0.19	0.38	0.33	-0.03
caused by somebody else's behavior	0.08	0.37	0.08	0.18
caused by a supernatural power	0.25	-0.37	-0.05	-0.04
spoke slower	-0.11	-0.45	0.05	0.09
heartbeat slowing down	0.29	-0.49	-0.26	-0.14
experienced the emotional state for a long time	0.38	-0.50	0.27	0.05
felt shivers	-0.35	-0.54	0.53	0.20
decreased the volume of voice	-0.13	-0.62	0.10	0.11
wanted to do nothing	-0.31	-0.63	-0.20	-0.34
a lump in throat	-0.47	-0.68	0.21	0.35
fell silent	-0.56	-0.71	0.04	0.15
showed tears	-0.29	-0.71	0.04	0.28
closed her or his eyes	-0.01	-0.74	-0.06	-0.18
felt hot	-0.30	-0.10	0.79	-0.18
heartbeat getting faster	-0.47	0.02	0.78	0.12
sweat	-0.41	-0.19	0.75	-0.13
blushed	0.03	-0.12	0.73	-0.18
breathing getting faster	-0.54	-0.05	0.73	0.16
perspired, or had moist hands	-0.49	-0.24	0.71	-0.15

produced abrupt body movements	−0.04	0.26	0.69	−0.04
spoke faster	−0.41	0.47	0.67	0.08
center of attention	0.34	0.11	0.64	−0.29
felt warm	0.54	−0.09	0.60	−0.17
opened her or his eyes widely	−0.09	0.27	0.59	0.45
changed the melody of her or his speech	−0.19	0.26	0.56	0.29
was in an intense emotional state	0.02	−0.47	0.55	0.26
enough resources to avoid or modify consequences	−0.04	0.44	0.48	−0.34
wanted to act, whatever action it might be	−0.21	0.39	0.40	−0.07
caused by chance	−0.26	−0.22	0.32	0.32
did not show any changes in face	0.20	0.33	−0.47	−0.42
did not show any changes in gestures	−0.18	0.01	−0.50	−0.07
did not show any changes in vocal expression	0.44	−0.04	−0.53	−0.40
had no bodily symptoms at all	0.37	0.45	−0.66	0.02
had the jaw drop	0.00	0.11	0.29	0.64
unpredictable	−0.52	0.03	0.33	0.61
felt an urge to be attentive to what is going on	0.43	0.13	0.34	0.56
wanted to take care of another person or cause	0.35	−0.18	−0.12	0.53

As the emotion terms formed the observations on the basis of which the factor analysis was executed, just as was the case in the GRID project, it was possible to investigate the position of the 95 emotion terms in the Procrustes rotated four-factorial structure (see Table 15.3). Negatively and positively valenced emotion terms are opposed to one another on the first experience factor. On the second experience factor mainly anger terms are being opposed to sadness terms, and to a lesser extent to fear terms. On the third experience factor, fear terms, and to a lesser extent anger terms, are opposed to being bored, peacefulness, and to lesser extent sadness. On the last experience factor all surprise terms have very high coordinates, namely *verwondering* (amazement), *verbazing* (astonishment), *verrassing* (surprise), and *geschrokken* (being startled) scored very high on the fourth factor. However, not only surprise terms, but also terms that imply empathy with somebody else had very high coordinates on this factor: the terms *bezorgdheid* (concern), *medelijden* (compassion), and *medeleven* (sympathy) were among the highest scoring emotion terms on this factor. Thus both the loadings of the features and the coordinates of the terms on the fourth experience factor imply that next to NOVELTY, also interpersonal care is referred to. Therefore, we will descriptively further label the fourth experience factor as EXPERIENCE NOVELTY/CARE.

Table 15.3 Coordinates of the 95 emotion words in the four-factorial experience structure after orthogonal Procrustes rotation toward the GRID meaning structure

Dutch emotion words	English translation	EXPERIENCE VALENCE	EXPERIENCE POWER	EXPERIENCE AROUSAL	EXPERIENCE NOVELTY/CARE
ongeduldigheid	impatience	-0.87	1.73	-1.08	-0.37
opgetogenheid	elation	1.17	1.53	0.55	0.09
verontwaardiging	indignation	-1.34	1.53	0.20	1.40
irritatie	irritation	-1.61	1.49	-0.80	-0.84
enthousiasme	enthusiasm	1.12	1.47	0.55	0.35
amusement	amusement	0.86	1.44	-0.02	-0.86
interesse	interest	0.70	1.33	-0.86	0.67
ergernis	annoyance	-1.47	1.27	-0.84	-0.60
boosheid	anger	-1.36	1.21	0.45	-0.04
onbegrip	incomprehension	-1.23	1.16	0.27	0.56
energie	energy	1.17	1.05	0.78	-0.95
opgejaagdheid	being routed	-1.16	1.03	0.82	-0.78
kwaadheid	anger	-1.42	1.02	0.21	0.09
frustratie	frustration	-1.43	0.97	-0.43	-0.55
voldoening	satisfaction	0.75	0.85	-0.20	-0.81
trots	pride	0.93	0.83	0.04	-0.24
opgewektheid	cheerfulness	1.17	0.80	-0.14	0.33
samenhorigheid	being together	1.04	0.79	-0.05	0.58
plezier	pleasure	1.01	0.77	0.40	0.18
vroljkheid	gaiety	1.08	0.67	-0.01	0.15
ontgoocheling	disillusionment	-1.21	0.66	0.00	-0.43
vreugde	delight	1.11	0.57	0.19	0.13
teleurstelling	disappointment	-1.17	0.54	-0.03	-0.18
nieuwsgierigheid	curiosity	0.49	0.45	0.11	0.11
blijheid	joy	1.00	0.44	0.33	0.36
fierheid	pride	1.12	0.43	0.29	-0.26
vertrouwen	trust	0.98	0.38	-0.37	-0.33
verwarring	confusion	-0.66	-0.54	0.48	0.05

genegenheid	affection	1.58	-0.70	0.13	0.01
genot	enjoyment	1.44	-0.76	0.00	-0.58
warmte	warmth	1.44	-1.13	0.07	-0.39
liefde	love	1.57	-1.18	0.45	0.12
verliefdheid	being in love	1.75	-1.44	1.19	0.41
bewondering	admiration	0.41	-1.51	-1.17	0.81
ontroering	being moved	1.16	-1.55	-0.32	1.02
triestheid	dejection	-0.58	-1.87	-0.70	0.49
droefheid	sorrow	-0.58	-1.87	-0.86	0.26
gemis	to miss	-0.01	-2.15	-0.59	-0.17
verdriet	sadness	-0.66	-2.42	0.10	0.53
eenzaamheid	loneliness	-0.70	-2.77	0.29	-1.12
pijn	pain	-0.65	-2.80	0.52	-1.06
verlegenheid	shyness	-0.03	-0.70	3.66	-1.54
paniek	panic	-0.88	-0.58	2.56	0.83
bangheid	fear	-0.60	-1.60	2.00	0.00
opwinding	excitement	0.56	1.18	1.90	0.45
euforie	euphoria	1.14	1.40	1.77	-0.53
schrik	terror	-0.58	-0.52	1.73	0.76
wanhoop	despair	-1.10	-0.24	1.64	-0.19
angst	fear	-0.67	-1.16	1.61	0.04
zenuwachtigheid	agitation	-0.20	-0.19	1.37	-1.16
woede	rage	-1.48	1.00	1.27	-0.07
schaamte	shame	-0.73	-0.77	1.23	-0.83
nervositeit	nervousness	-0.55	0.51	1.04	-0.78
spanning	tension	0.04	0.46	0.94	-0.67
zorgeloosheid	carefreeness	1.52	0.32	0.79	-0.62
opluchting	relief	0.31	0.48	0.56	0.11
geluk	happiness	1.30	-0.08	0.17	0.06
machteloosheid	powerlessness	-1.27	-0.23	-0.38	0.34
twijfel	doubt	-0.64	0.37	-0.55	-0.24
goed gevoel	feeling good	0.59	0.69	-0.84	-0.29

tevredenheid	contentment	0.79	0.36	-0.93	-0.80
hoop	hope	-0.22	0.14	-1.05	0.99
gezelligheid	cosiness	1.06	0.39	-1.10	-0.65
spijt	regret	-0.89	-0.09	-1.38	0.11
geruststelling	reassurance	0.50	0.48	-1.82	-0.01
vredigheid	peacefulness	1.32	-1.09	-1.87	-0.94
kalmte	calmness	0.44	-0.51	-2.02	-1.34
verveling	boredom	-1.37	0.05	-2.84	-2.19
geschrokken	being startled	-0.86	-0.39	0.39	2.61
medeleven	sympathy	-0.24	-1.20	-1.36	2.59
verrassing	surprise	0.79	0.70	0.51	2.20
verbazing	astonishment	-0.39	0.81	-0.29	2.12
medelijden	compassion	-0.71	-0.45	-1.31	2.11
verwondering	amazement	0.03	0.18	-0.33	2.03
bezorgdheid	concern	-0.46	0.13	-0.68	2.01
ongeloof	disbelief	-0.86	-0.07	0.05	1.95
hulpeloosheid	helplessness	-1.05	-0.85	-0.77	1.28
ongerustheid	worry	-0.91	0.20	-0.52	1.06
tederheid	tenderness	1.37	-0.80	0.07	1.04
verbondenheid	solidarity	1.22	-0.20	-0.15	0.74
vriendschap	friendship	0.99	0.64	-0.65	0.74
dankbaarheid	gratitude	0.71	-0.49	-0.16	0.71
onmacht	incapacity	-1.18	-0.01	-0.13	0.64
schuld	guilt	-0.85	-0.26	0.32	-0.43
onzekerheid	uncertainty	-0.69	-0.16	-0.19	-0.45
onrust	unrest	-0.91	-0.39	0.10	-0.68
ongemak	discomfort	-0.84	-0.19	0.34	-0.74
verlangen	longing	0.63	0.18	-0.33	-0.77
ontspanning	relaxation	1.10	0.09	-0.86	-0.92
stress	stress	-0.82	0.28	0.40	-0.97
rust	quietness	1.02	-0.50	-1.03	-1.06
verveeldheid	being bothered	-1.32	0.16	-0.90	-1.11

jaloëzie	jealousy	-1.40	0.01	-0.60	-1.52
vrijheid	freedom	0.83	-0.21	-0.88	-1.60
moeheid	tiredness	-0.44	-1.03	-0.47	-2.59

After orthogonal Procrustes rotation, EXPERIENCE VALENCE accounted for 46.85% of the total variance, EXPERIENCE POWER for 10.87%, EXPERIENCE AROUSAL for 10.90%, and EXPERIENCE NOVELTY/CARE for 5.06%.

p. 251 Thus, while POWER was clearly more important than the AROUSAL ↵

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in the GRID meaning structure, EXPERIENCE POWER and EXPERIENCE AROUSAL were of equal importance in the experience structure.

15.3 Discussion

The present chapter investigated whether the meaning structure of emotions, which formed the focus of the GRID project, could be generalized to the structure of actual emotional experiences. Based on the lexical sedimentation hypothesis a parallelism was expected between the emotion processes inferred from emotion terms and the actual emotional experiences that are labeled with these emotion terms, and thus that VALENCE, POWER, AROUSAL, and NOVELTY would also structure daily emotional experiences. However, based on the dominant psychological research that asks people to rate their own emotional experiences on emotion and feeling terms, it could be expected that daily emotional experiences were only systematically structured according to the dimensions of VALENCE and AROUSAL. In the current chapter, special attention was paid to three methodological factors that could account for the divergence between the psycholinguistic and the current psychological experience research, namely (1) the selection of terms that are used to study the experience structure, (2) the reliability of the assessment of the emotional experiences, and (3) the interpretation of the dimensions in terms of the underlying emotion processes. The findings in the current research, with respect to each of these three methodological factors, are discussed.

By asking people to qualitatively label their emotional experiences by three emotion and/or feeling terms, these terms can be considered relevant and representative for the actual emotional experiences of the participants. Moreover, by explicitly asking for both emotion and feeling terms, the terms are not only relevant for a psycholinguistic perspective that works with prototypical emotion terms (e.g., *angry* and *sad*), but are also relevant for the dominant self-report research in psychology that additionally relies on feeling terms that describe the general quality of the emotional experience (e.g., *good*, *strong*, or *tense*).

By looking at the average experience patterns across the 137 emotion features, it was possible to identify highly reliable experience patterns. Although there was substantial variability between episodes that were labeled

with the same term, there was still sufficient resemblance with an average profile to allow for the identification of reliable experience patterns. Contrary to what has been claimed by constructivist authors (e.g., Lindquist & Barrett, 2008), the current results indicate that people tend to choose emotion labels in a systematic way as a function of the underlying emotion process.

p. 259 By using the GRID features, it was possible to look at the constituting parts of the emotional experiences. Information on the global interpretation of the emotional experience (included in emotion and feeling words) could be related to the experience of Appraisals, Bodily reactions, Feelings, Expressions, and Action tendencies that constitute the emotion. This allowed us to interpret the meaning of the emotion dimensions on the basis of the processes that constitute the emotions. The expectation from the lexical sedimentation hypothesis was by and large confirmed. A factor analysis pointed to a four-factorial structure. These four experience factors shared basic properties with the meaning factors from the GRID project. The first experience factor could also be interpreted as VALENCE, the second as POWER, and the third as AROUSAL. The fourth experience factor and the fourth meaning factor shared NOVELTY appraisals and facial expressions that are typical for surprise. Moreover, the freely generated emotion terms were differentiated in almost the same way on these four experience factors as was observed on the meaning factors: anger, fear, and sadness terms were opposed to joy terms on the first factor; anger terms were opposed to sadness (and fear) terms on the second factor; fear (and anger) terms were opposed to peacefulness (and sadness) terms on the third factor; and surprise terms scored high on the fourth factor. Thus, the prediction on the basis of the existing literature on emotional experiences that the actual emotional experience is structured exclusively along VALENCE and AROUSAL can be discarded: There is very clear evidence that POWER and NOVELTY do play an important role in actual daily emotional experiences.

Still the experience structure did not perfectly mirror the meaning structure. There were two major differences. First, it was observed that the AROUSAL dimension is much more important in the experience structure than in the meaning structure. EXPERIENCE AROUSAL and EXPERIENCE POWER were equally important in the experience structure, while POWER was clearly more important than AROUSAL in the meaning structure. Three related and not-mutually exclusive explanations are plausible for this observation: (1) AROUSAL is just more important in the actual experience of emotions than in the meaning of terms per se; (2) the current experience research worked with many more emotion terms (95) than the GRID meaning study (with 24 terms) did, which implies that the emotion domain is more profusely represented in this experience study than in the GRID study. We observe for instance that people report very high intensity terms that were not included in the GRID study, such as *paniek* (panic), *woede* (rage), and *euforie* (euphoria); (3) we asked people to use emotion *and* feeling labels. While most spontaneously reported terms were emotion terms, also typical feeling terms that describe the general quality of the emotional experience such as *moeheid* (tiredness) and *goed gevoel* (good feeling) were reported. As it was found in the GRID study that the AROUSAL factor was more salient in the Feeling component compared to the overall emotion structure (see Chapter 8), it is possible that these feeling terms have contributed to the importance of the AROUSAL factor in the experience structure.

The second important difference between the experience and the meaning structure was observed for the fourth factor. While this factor was characterized by NOVELTY appraisals and facial expressions of surprise, and surprise terms have high scores on this factor, the experience structure showed an additional tendency toward terms that imply taking care of another person and terms of sympathy and compassion. A possible post hoc explanation for this observation is that there is an asymmetrical relationship between surprise and compassion in daily emotional episodes. While it makes, theoretically, no sense to assume that surprise would imply compassion, it is very well possible that the experience of compassion is often unexpected in daily life.

15.4 Conclusions

The current chapter reports data that lend strong support for the lexical sedimentation hypothesis: There is a high correspondence between the meaning structure and the experience structure in the emotion domain. Both are defined by an interplay between Appraisals, Bodily reactions, Expressions, Action tendencies, and Feelings. Moreover, not only VALENCE and AROUSAL structure daily emotional experiences, but also POWER and NOVELTY. This implies that the meaning structures that have been identified in the GRID project are not only relevant for psycholinguistic research on the meaning of emotion words, but also offer a solid basis for hypothesis development about the emotion processes themselves.

Notes

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- 2 It has to be noted that this prediction holds in general, and does not mean that every individual emotion label used in a specific situation by a particular person forms an accurate representation of the underlying emotional experience.
- 3 Accidentally five action tendency features were lost in the construction of the experience website.
- 4 All supplementary materials (SM) are available at the GRID website: <http://www.affective-sciences.org/GRID>. See Appendix 1 (“Availability”) for further details.