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Emotional connotations of words related to authority and community

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Abstract We present a database of 858 German words from the semantic fields of authority and community, which represent core dimensions of human sociality. The words were selected on the basis of co-occurrence profiles of representative keywords for these semantic fields. All words were rated along five dimensions, each measured by a bipolar semantic-differential scale: Besides the classic dimensions of affective meaning (valence, arousal, and potency), we collected ratings of authority and community with newly developed scales. The results from cluster, correlational, and multiple regression analyses on the rating data suggest a robust negativity bias for authority valuation among German raters recruited via university mailing lists, whereas community ratings appear to be rather unrelated to the well-established affective dimensions. Furthermore, our data involve a strong overall negative correlation—rather than the classical U-shaped distribution—between valence and arousal for socially relevant concepts. Our database provides a valuable resource for research questions at the intersection of cognitive neuroscience and social psychology. It can be downloaded as supplemental materials with this article.

Keywords Affective word database · Ratings · Authority · Community · Valence · Arousal · Potency

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Introduction

Affective lexica have become an important tool for many lines of research on the interplay of language, emotion, and social interaction. In psychology and neuroscience, such data sets can be used to select highly standardized stimuli for experiments investigating (for example) emotional influences on language processing. In the social sciences, these lexica are used to examine cultural norms and values that are implicitly contained in the emotional connotations of words. To our knowledge, no previous sentiment repository has specifically targeted the semantic realm of human sociality. Therefore, this article presents a new word data set that provides affective ratings for 858 words representing authority and community, two core dimensions of human social coordination (Fiske, 1992; see also Scholl, 2013). We also introduce new scales that measure the semantic content of words along these two dimensions. Finally, to shed light on the relationship of affect and sociality in the minds of native German speakers, we conducted a series of cluster and multiple regression analyses.

State of research

In the flourishing research field on the emotion–language relationship, scholars have compiled a growing number of data sets providing emotion-related rating data on (mainly written) words in many languages, including English (the Affective Norms for English Words/ANEW; Bradley & Lang, 1999; Warriner, Kuperman, & Brysbaert, 2013),

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Spanish (Redondo, Fraga, Comesaña, & Perea, 2005; Redondo, Fraga, Padrón, & Comesaña, 2007), German (Schmidtke, Schröder, Jacobs, & Conrad, 2014; Schröder, 2011; the Berlin Affective Word List/BAWL: Võ et al., 2009; Võ, Jacobs, & Conrad, 2006), Portuguese (Soares, Comesaña, Pinheiro, Simões, & Frade, 2012), French (Silva, Montant, Ponz, & Ziegler, 2012), Finnish (Eilola & Havelka, 2010), or Italian (Montefinese, Ambrosini, Fairfield, & Mammarella, 2013).

Most of these repositories capitalize on the dimensional view of emotion (e.g., Osgood, Suci, & Tannenbaum, 1957; Russell & Mehrabian, 1977; Wundt, 1896). They provide emotional rating data of words on at least two of the well-established three bipolar affective dimensions of valence, arousal, and potency, which are usually measured by the standard semantic-differential technique (Osgood et al., 1957). Together, these dimensions efficiently characterize the *affective meaning* of a given word (Osgood, 1962).

Although these basic dimensions are sometimes labeled differently, they are pervasive in many behavioral phenomena. Scholl (2013) even considers them the socioemotional basis of human communication. Hence, it is not surprising that affective word data sets are applied in a broad variety of research domains.

For instance, in the research fields of emotion, cognition, and language processing, these lexica serve as important sources for selecting highly controlled and well-described stimuli. Abounding studies provide evidence for the processing advantages of affective word stimuli in language processing, which together make the clear point that emotional word content influences human perception and behavior at the automatic processing stages preceding conscious evaluation of emotional content. In the case of visual word processing, effects have been shown on such behavioral measures as response latencies (Huckauf, Heller, & Gouzouli-Mayfrank, 2003; Kousta, Vinson, & Vigliocco, 2009; Võ et al., 2006) or memory performance (e.g., Doerksen & Shimamura, 2001; Kensinger & Corkin, 2003), on such physiological measures as pupil dilation (Kuchinke, Võ, Hofmann, & Jacobs, 2007; Võ et al., 2008), or on the neural correlates of language processing, using event-related potentials (e.g., Conrad, Recio, & Jacobs, 2011; Hofmann, Kuchinke, Tamm, Võ, & Jacobs, 2009; Kissler & Koessler, 2011; Recio, Conrad, Hansen, & Jacobs, 2014; Schacht & Sommer, 2009; see Citron, 2012, for a review), transcranial magnetic resonance stimulation (Weigand et al., 2013), or functional magnetic resonance imaging (Grimm, Weigand, Kazzer, Jacobs, & Bajbouj, 2012; Hamann & Mao, 2002; Herbert et al., 2009; Kuchinke et al., 2005; Tabert et al., 2001). The influence of words' affective features can also be observed in experiments using tasks for which emotion is per se irrelevant, such as lexical decision or the affective Simon task (Altarriba & Basnight-Brown, 2011), or for which affective influences even interfere with efficient resolution of the task (the emotional Stroop task: Malhi, Lagopoulos, Sachdev, Ivanovski, & Shnier, 2005; Sass et al., 2010).

Beside these experimental approaches, affective word databases and the relations between their rating dimensions on their own constitute a tool for developing different models of affect (see Bradley & Lang, 1999; Russell, 1980) or for investigating the emotion–cognition coupling via regression analyses: Most recently, Kuperman, Estes, Brysbaert, and Warriner (2014) linked affective ratings from a large-scale database (Warriner et al., 2013) to the lexical decision and naming latencies provided in the English Lexicon Project (Balota et al., 2007). They found independent monotonic effects of both valence and arousal on word response latencies, showing that inclusion of these emotional factors indeed improves the efficiency of models of word recognition.

Social psychologists have relied on affective lexica to investigate similarities and differences regarding the emotional connotations of concepts across different cultures and languages, since affective meanings are thought to influence human behavior and perception through automatic processes (Heise, 2007, 2010; Schröder & Thagard, 2013; Sewell & Heise, 2010). Also, affective lexica are a standard methodological tool in sentiment mining and in related techniques investigating the affective connotations of large sets of communication data—for example, in social media such as Twitter or Facebook (see Thelwall & Kappas, 2014).

To summarize, there is a clear need for affective-meaning repositories in many areas of the social and behavioral sciences. Many questions dealing with emotion processing in general can be addressed using the general-purpose data sets reviewed above, which have been published for various languages. Most likely, the construction principle of these databases was to offer emotion ratings for a number of (mainly) frequently used words from a given language that seemed to warrant an optimal spread of rating values for the respective dimensions—regardless of semantic fields. At least, we can state that this is so for the construction of the German BAWL database (Võ et al., 2009; Võ et al., 2006).

This may, however, represent a problem for many more specific research questions aiming at specific semantic fields, because the currently available affective lexica often lack enough words of a specific category. To meet such shortcomings, Ferré, Guasch, Moldovan, and Sánchez-Casas (2012), for example, developed a data set consisting of words from the three semantic categories of animals, people, and objects.

Current research in the fields of sociology and social psychology (see, e.g., Ambrasat, von Scheve, Schauenburg, Conrad, & Schröder, 2014, on the relationship of affective meanings and socioeconomic status) focuses on the emotional connotations of words from semantic fields related to core dimensions of sociality. Fundamental unit-ideas of sociality have been paradigmatically developed by Fiske (1992), Nisbet (1966), and Kemper (1978). Two core elements, pivotal to the sociological phenomena of cohesion and disintegration are *community* and *authority*, which reflect two central

facets of society: The concept of authority is associated with status differences and power asymmetries within a society, whereas the concept of community relates to the issue of group belongingness and social affinity.

But, at present, researchers interested in the affective meanings of words from these semantic fields face the problem that such words are underrepresented in available databases, which clearly limits the investigation of emotional aspects in the domains of authority and community. We, therefore, developed the specific data set described in the present article to facilitate future research on the relationship between language, affect, and human sociality.

The present study

The present data set contains affective ratings for 858 German words, specifically selected to cover the breadth of the semantic fields of authority and community. A challenge in allocating words to semantic fields is that word meanings are often fuzzy, context-dependent, and not mutually exclusive concerning the underlying concept. We therefore developed a three-step procedure (see the Method section for details) to select words representing the two semantic fields.

For all resulting 858 words, we collected affective meaning ratings on the three emotion dimensions of valence, arousal, and potency using an online survey and the semantic-differential technique (Osgood et al., 1957).

In addition, we developed two novel semantic-differential rating scales directly assessing perceived authority and community for all of the words with another group of participants.

Finally, we investigated the interplay between all five rating dimensions using cluster analyses and multiple regressions—positioning authority and community in the affective space of German culture.

Method

Stimulus selection

The stimulus selection proceeded in three steps. First, we generated core units of the semantic fields of community and authority by asking 25 undergraduate German native speakers at the Freie Universität Berlin to write down 20 words that they intuitively associated with the two concepts. Second, we sought to broaden this core set of words in order to more thoroughly represent our target semantics. We therefore took the most frequently mentioned words as starting points for a selection of semantically similar words based on the Co-Occurrence Data Base of the Institute for the German Language at Mannheim (Belica, 1995, 2001). This database approximates semantic similarity by comparing the co-occurrence profiles of various words (Belica, 2011; Keibel & Belica, 2007); that is, semantic proximity is defined by words sharing similar co-occurrence profiles. We used the words "authority" and "community" and their ten most frequently mentioned associates (e.g., "family," "friend," or "boss") as starting points for the progressive selection from this co-occurrence database. In view of future applications of our data set, we furthermore focused on words relevant to social interactions—that is, words denoting social identities (nouns), actions (verbs), adjectives, and settings (e.g., "playground"; see Heise, 2007, for a review of approaches to model social events as linguistic configurations of actors, traits, behaviors, and settings). Using this procedure, we obtained 647 words from the fields of authority and community. In a third step, we included words in the data set that we deemed relevant but that were missing from the outcome of the procedure described above. For instance, we added words denoting additional social identities, to cover a more extensive range of important aspects of society. We also added antonyms (e.g., "justice" vs. "injustice") or synonyms (e.g., "manly" vs. "masculine"; to cover potential etymology-related differences in their affective connotations) of some previously entered words—or simply added some closely related ones (e.g., "work," "unemployed," and "unemployed person"). To facilitate future use of the database at the level of sentences describing social interactions (see Heise, 2007), we added verbs derived from relevant nouns (e.g., "to boast" in addition to "poser"). Similarly, we joined a variety of adjectives presumably modulating the affective meanings of settings or social identities (e.g., "moody police woman" vs. "polite police woman"). Finally, we added specific concepts we considered to be of special interest in the context of contemporary German society—for example, "East German," "West German," or "Turkish."

In total, we devised a data set of 858 words comprising 206 adjectives, 142 verbs, and 510 nouns. According to the terms used by the above-mentioned social psychological research tradition (see Heise, 2007), among the nouns, 193 were abstract words, 278 denoted social identities, and 39 were settings, whereas all 142 verbs were simply labeled *behavior words*.

Ratings on valence, arousal, and potency

Participants All participants were recruited via the mailing list for people interested in current research projects from the interdisciplinary research institute "Languages and Emotion" (at Freie Universität Berlin) and by asking different universities and student committees from various universities in Germany to forward the link to our survey. Participation was rewarded by a lottery for three vouchers for a visit to the movies, including snacks and drinks for two persons. A total of 612 participants completed the survey: 146 males and 461

females (five of the participants did not provide their gender), mean age = 31.82 years, *SD* = 10.75 years, range = 17–75 years (six of the participants did not provide their age).

Rating instrument: Semantic differential scales for valence, arousal, and potency We measured the affective meanings of words using semantic-differential scales for the three dimensions *valence*, *arousal*, and *potency*. These scales were graded in nine points. The middle position represented *neutral* ("neutral"), from which rating points running left and right to the antonym anchors were labeled *etwas* ("slightly"), *ziemlich* ("quite"), *sehr* ("very"), and *äußerst* ("extremely"). For the antonym words describing each dimension, the anchors were labeled *angenehm* ("pleasant") versus *unangenehm* ("unpleasant") for valence, *beruhigend* ("calming") versus *aufregend* ("exciting") for arousal, and *schwach* ("weak") versus *mächtig* ("powerful") for potency.

Procedure Each participant was asked to assess 50 randomly assigned words on the three dimensions. Thus, in total, each respondent completed 150 ratings. Words were presented in three separate, randomly assigned rating blocks for each dimension; that is, every rating block contained each of the 50 words in a randomly assigned order that was consecutively assessed on one dimension. Each rating block started with an introduction to the rating procedure, followed by the words and an example. Words were presented one by one while participants were asked to provide their ratings. Participants completed the survey, on average, in 23 min. The survey was provided using the Internet software Unipark. On average, each word was rated in each dimension by 35 respondents (number of ratings: mean = 35.16, *SD* = 5.31).

Ratings on authority and community

Participants We recruited mainly student participants via mailing lists from the social sciences and humanities departments of universities in Berlin and Potsdam, Germany. In all, 231 participants completed the online survey (76 males, 132 females; mean age = 27.71 years, *SD* = 4.94 years, range = 20–57 years; 23 of the participants did not indicate either sex or age). Participation was voluntarily and not rewarded.

Rating instrument: Semantic-differential scales for authority and community Using the design of the semantic-differential scale employed in the first study, we developed a nine-point Likert scale with antonym anchors. For authority, the scale went from *autoritär* ("authoritarian") via *weder/noch* ("neither/nor") to *egalitär* ("egalitarian"), and for community, the scale went from *gemeinschaftlich* ("communal") via *weder/noch* ("neither/nor") to *individualistisch* ("individualistic"). Again, from the middle to each end of the scale, the anchors were described as *etwas* ("slightly"), *ziemlich* ("quite"), *sehr* ("very"), and *äußerst* ("extremely").

Procedure In a first run, participants rated those 647 words belonging to the semantic fields of authority and community that were selected according to their co-occurrence profiles. Participants judged 60 words that were randomly assigned and were presented one by one on the two scales for authority and community. The rating scales were presented below the target words. We randomly assigned which scale was presented below the other, as well as the sides of the anchors of the scales. On average, participants spent 18.85 min to complete the survey. In a second run, we included only those words in the survey that we had added to the word pool in the third, more intuitive step of corpus generation (see above). This time, participants rated all 211 words that had been added subsequently (which took about 40 min, on average). The survey was provided using the Unipark survey tool. Each word in this survey was rated by 18 respondents, on average (mean number of ratings per word = 18.17, *SD* = 5.03).

Results and discussion

As a reliability check of our ratings, for the 243 words that overlapped with the BAWL database (containing 2,900 words; Võ et al., 2009), we calculated Pearson correlations between the mean ratings obtained in our study and those from the BAWL for the valence ($r = .95$) and arousal ($r = .79$) dimensions (the BAWL does not provide potency data). These high correlations support the reliability of our rating instruments for the evaluation and arousal dimensions (see Schmidtke et al., 2014, for similar findings and a discussion of why valence ratings appear to be more reliable than arousal ratings). The ANGST database of Schmidtke et al., a German version of the ANEW (Bradley & Lang, 1999), offered the possibility to also check the validity of the potency variable, which is not included in the BAWL. For the few (106) overlapping words (of 1,003 words in the German ANGST), the bivariate correlation between our potency ratings and ANGST potency was $r = .79$. Both valence variables were, again, highly correlated ($r = .96$), and so were—though again, slightly less —the arousal ratings ($r = .85$). Note that the low overlap with both lexica also reveals how few words from the BAWL and the German adaption of ANEW are apparently relevant, regarding the more socially focused semantic fields of authority and community.

On the other hand, this raises the question of whether our rating data—and, in particular, the data for the majority of our words that were *not* present in the BAWL or ANGST—might involve a bias, due to the fact that we had presented our participants with so many words belonging to these specific

semantic fields of authority and community—which might have caused them to apply specific rating strategies that would differ from the ones normally reflected in affective lexica.

To this end, we compared our data to those recently provided for almost 14,000 English lemmas (Warriner et al., 2013)—hopefully providing an increased overlap with our word material, as compared to BAWL and ANGST—to further test for the general reliability of our data beyond the context potentially created by the choice of words for our study. Correlations between Warriner et al.'s and our rating data, for now 659 overlapping words, were as follows: We found a high positive correlation for valence (r = .84) and a midlevel correlation for arousal (r = .53). Note that this pattern of results exactly mirrors what Schmidtke et al. (2014) reported for the general reliability of valence and arousal ratings across languages. We thus conclude that our rating data appear to be highly reliable in general and that, in particular, the ratings seem not to be biased by the fact that participants were presented mainly with words from the specific semantic fields of authority and community. Note that the remaining dimension of potency is not included in the data of Warriner et al., who instead collected dominance ratings. As Schmidtke et al. showed, the general relation between potency and dominance ratings is rather loose and difficult to interpret, and we therefore refrained from basing any conclusions on potential respective correlations—in particular, when computed across languages and corpora.

Cluster analyses

To identify subcategories of the semantic fields of authority and community with regard to affective experiences among our German respondents, we ran a cluster analysis on our database. For clustering, we used mean ratings for valence, arousal, potency, authority, and community and the *k*-means method, a partitional clustering approach. The *k*-means algorithm generates nonoverlapping homogeneous groups. We selected an eight-cluster solution that appeared to provide an optimal degree of differentiation—in comparison to cluster solutions with fewer or more clusters. We based our interpretation and labeling of each cluster on the respective means of the rating dimensions and on the representative keyword-specific values that were closest to the relevant cluster means.

Table 1 shows the cluster means of each dimension and includes the ten most representative words for each cluster, along with cluster labels. The cluster sizes varied between 80 and 136 words. Cluster 1 (N = 90) agglomerates expressions with a neutral to slightly negative valence, but socially powerful and influential meanings (such as *politician*, *to judge*, *to direct*, *boss*, *elite*, and *powerful*). Cluster 2 (N = 98) summarizes negative and highly arousing authority concepts (such as *aggressive*, *to threaten*, *leader*, *interrogation*, *to imprison*, *to discriminate*, and *to punish*). However, Clusters 1 and 2 are quite similar regarding their means for the authority, community, and potency variables: Both include concepts that are rather neutral on the community scale but high on the authority and potency dimensions (showing the highest authority means across all clusters). Nevertheless, they differ in terms of valence and arousal: Cluster 1 comprises rather neutral concepts that are slightly arousing, whereas Cluster 2 contains clearly negative and highly arousing words. Regarding Cluster 3 (N = 123) and Cluster 4 (N = 98), again, the most salient differences can be found in the valence and arousal dimensions: Cluster 3 includes very positive concepts (with the highest valence means across all clusters) that are very calming; thus, it incorporates appeasing positive community-related concepts such as *summer evening*, *hope*, *partner*, *thanks*, *to give a present*, *to support*, and *mate*. In contrast, Cluster 4 contains neutral community words with a slightly arousing connotation, which might be due to their antiauthoritarian coloring—concepts such as *subculture*, *left*, *street worker*, *opposition*, and *nongovernmental*. Clusters 3 and 4 are comparable in terms of authority, community, and potency: The two include highly communal (the most communal means across all clusters), hardly authoritarian (the lowest authority means across all clusters; e.g., rather egalitarian concepts) concepts that are slightly potent. Cluster 5 (N = 114) and 6 (N = 119) are similar, in that they both agglomerate concepts that are faintly communal and rather individualistic, and that have neither a very authoritarian nor a particularly egalitarian meaning. However, as compared to Cluster 6, Cluster 5 is much more positive, less arousing, and more powerful. Thus, this cluster can be described as grouping success- and achievement-associated positive individuality words, which is mirrored by its keywords, such as *to achieve*, *character*, *to honor*, *researcher*, and *to admire*. In contrast, Cluster 6 contains negative and antisocial concepts such as *rascal*, *jealous*, *sabotage*, *antisocial*, *faithless*, and *lie*. Cluster 7 (N = 136) groups words such as *technician*, *craftsman*, *landlord*, *electrician*, and *private tutor*, which could be summarized under the label of rather neutral professions and social identities. By contrast, Cluster 8 (N = 80) includes concepts that share clearly negative social stereotypes, such as *unemployed person*, *primitive*, *invalid*, *without a fight*, and *disabled*. Both clusters are characterized by rather neutral means regarding the community and authority dimensions, although Cluster 8 is slightly more authoritarian. Both groups differ as to their valence, arousal, and potency dimensions: In Cluster 7, all variables show rather midscale means, whereas the concepts included in Cluster 8 are rather negative, medium to rather arousing, and rather weak regarding their potency.

Correlational analyses and multiple regressions

In the next step, we conducted correlational and multiple regression analyses to investigate how the ratings on the two

Table 1 Clusters: Number (No.), size (*N*), mean (*M*), and standard deviation (*SD*) of authority, community, valence, arousal, and potency, with a label and keywords for each cluster

Cluster		Authority		Community		Valence		Arousal		Potency		Label	Keywords
No.	N	M	SD	M	SD	M	SD	M	SD	M	SD		
1	90	6.87	0.73	4.88	1.28	4.56	0.49	5.60	0.67	6.29	0.68	Neutral, socially powerful and influential concepts	Politician, boss, elite, king, leader of men, powerful, to grade, to instruct, to rule, to judge
2	98	7.58	0.65	4.43	0.99	2.73	0.59	7.07	0.52	6.62	0.52	Negative, highly arousing authoritarian concepts	Aggressive, leader, to coerce, to threaten, pressure, to punish, interrogation, to manipulate, to marginalize, to arrest
3	123	3.71	0.76	6.32	1.12	7.22	0.53	3.65	0.74	6.15	0.73	Positive, calming community concepts	Summer evening, hope, partner, thanks, fellow, to give a present, to thank, to help, to support, confederates
4	98	4.22	0.68	6.59	0.85	5.40	0.70	5.52	0.82	5.58	0.66	Neutral community concepts with antiauthoritarian coloring	Nongovernmental, party guest, subculture, left, social worker, street worker, opposition, staff council, football player
5	114	5.47	0.73	3.76	0.92	6.41	0.59	5.07	0.97	6.45	0.53	Positive, success-related individuality concepts	To achieve, charismatic, independent, character, industrious, to admire, researcher, to honor, autonomous, performance
6	119	5.91	0.62	3.78	0.88	2.97	0.55	6.76	0.44	5.60	0.55	Negative, unsocial concepts	Rascal, jealous, disturber, sabotage, spoilsport, unsocial, to abandon, rebuff, unfaithful, ingratitude
7	136	5.21	0.58	4.91	1.12	5.12	0.50	4.86	0.60	4.93	0.56	Professions and social identity concepts	Technician, craftsman, skilled worker, landlord, custom, bourgeois, to please, client, private tutor, electrician
8	80	5.75	0.79	4.39	0.89	3.40	0.61	5.66	0.60	3.97	0.53	Concepts of negative social stereotypes	Without a fight, to be embarrassed, disabled, primitive, sick, unconfident, useless, jobless, shy, temporary worker

new sociality scales relate to each other and to ratings on the classical affective dimensions. Scatterplots of all variables are shown in Fig. 1. Bivariate and partial correlations are shown in Table 2. To account for possible nonlinear correlations, we applied regression models not only to the whole data set, but also for split data sets containing either positive or negative words (Tables 3 and 4), low- or high-authority words (Table 5 and 6), and high- or low-community words (Tables 7 and 8). For these analyses, the data set was split by each scale's center using the midpoint of 5. Valence has been shown to be a clearly bipolar dimension and to relate to, for example, arousal in a quadratic fashion (see the U-shaped distribution of valence and arousal; Bradley & Lang, 1999), justifying this split when investigating the relation with other variables (see Schmidtke et al., 2014, for the same procedure). Since the rating dimensions of authority and community are novel and their character is unknown, we opted for the same splitting in addition to the documentation of correlations across the whole range of these dimensions, in order to be able to capture potentially similar phenomena reflecting a bipolar or multidimensional character of these scales, involving not completely linear relations to other dimensions.

We did not split the data set for the potency and arousal dimensions, for brevity's sake, and because both dimensions could rather be considered unidimensional. In total, we thus ran 7 × 5 regression analyses predicting each rating dimension as a function of the other four, for the whole data set and for all subsets. Correlations between the dimensions are presented and discussed in each case, according to their order of entry in the stepwise multiple regression model for the whole data set. Since these data involved the novel rating dimensions of authority and community, we decided to stick to a rather simple linear regression approach—while using splits of the data set in order to capture basic patterns of nonlinear relations. Kuperman et al. (2014) have shown that nonlinear regression models may provide a good account for effects concerning affective rating data, but choosing a specific nonlinear regression model requires at least some theoretical assumptions with regard to the relation between the variables involved. Given the novelty of the authority and community scales, we refrained from such specific assumptions concerning their nature in this first empirical study, and instead preferred to document their relation to other rating dimensions according to the most simple regression model

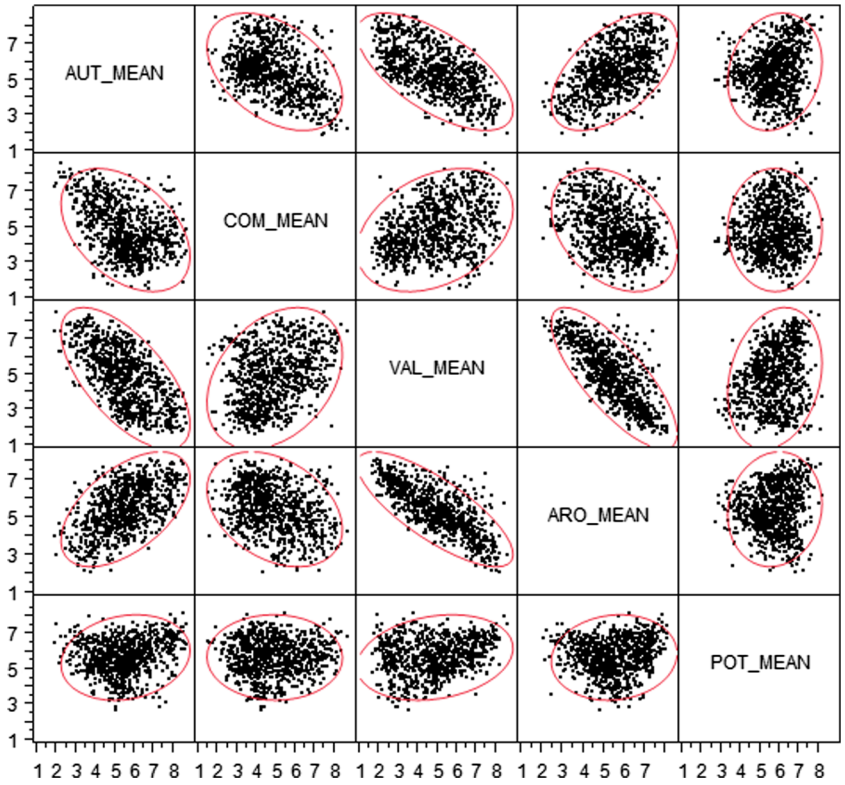

Fig. 1 Scatterplots of all five variables (AUT = authority, COM = community, VAL = valence, ARO = arousal, POT = potency)

at hand—the linear one. The respective outcomes for the whole data set or for the subsets of specific dimensions presented here might serve as heuristics to inspire future, more fine-grained statistical approaches on the data set provided.

Authority In all, 57 % of the variance of the authority ratings can be explained via the other dimensions. Mainly, both bivariate and partial correlations reveal that authority ratings increase with—in the order of entry into the model—more negative valence ($r = -.65$), higher potency ($r = .54$), and lower community ($r = -.43$) ratings. The finding of this negativity bias for authoritarian concepts is especially remarkable, because it holds true even for the subset of generally positive concepts ($r = -.55$). The tight and rather intuitive relation between potency and authority, with increasing potency leading to higher authority ratings, only, but quite consistently, disappears for the range of low-authority or egalitarian words ($r = -.28$, $r_{partial} = -.02$), for which authority, in the strict sense of the word, might simply not be an issue. The negative correlation between authority and community ratings suggests, at first glance, that these two scales might be antonymic to each other, but the specific data from our subsets show that this inverse relation vanishes for the ranges of negative ($r = .34$), highly authoritarian ($r = .09$), and low-communal or individualistic words ($r = -.01$), for which ratings on both scales appear to be unrelated. Whereas all of the above-mentioned phenomena are reflected equally by both bivariate and partial correlations, a particularly interesting pattern emerges for the relation of arousal and authority ratings: Whereas positive bivariate correlations between the two meet the intuition that increasing arousal involves an increasing level of authority, the opposite direction is given in the multiple regressions: After considering the influence of other variables, increasing authority is accompanied by decreasing arousal (except for low-authority words, $r_{partial} = -.23$), which might reflect the role of authority in calming social tension—even though this phenomenon in the affective rating data is superficially masked in the bivariate correlations by the fact that authority correlates positively with potency and negatively with valence (the respective correlations of which with arousal ratings will be presented later on).

Community In comparison to the authority ratings, only a relatively small percentage of variance (20 % vs. 57 %) of the community ratings is accounted for by the other rating dimensions for the whole data set. As is evident from the bivariate correlations, increased community ratings are accompanied by decreasing authority ($r = -.43$), more positive valence ($r = .34$), and lower arousal ratings ($r = -.35$). Only community's inverse relation to authority and lower arousal predicting higher community were significant in the multiple regressions model using all words. The relatively weak relation of community to alternative concepts becomes especially evident in the subset of low-community, individualistic concepts, where no single predictor attains significance. This probably reflects the fact that individualistic concepts

Table 2 Matrix of bivariate and partial correlations for the whole data set of 858 words: Information about R^2 and stepwise consideration by multiple regression models predicting valence (VAL), arousal (ARO), potency (POT), authority (AUT), and community (COM), including descriptive statistics

	Valence				Arousal				Potency				Authority				Community				Descriptive statistics		
	Bivariate	Partial	R^2	Step	Bivariate	Partial	R^2	Step	Bivariate	Partial	R^2	Step	Bivariate	Partial	R^2	Step	Bivariate	Partial	R^2	Step	*M*	*SD*	*Range*
VAL					$-.78^{***}$	$-.75^{***}$	.61	1	$.22^{***}$	$.60^{***}$	.05	1	$-.65^{***}$	$-.57^{***}$	.42	1	$.34^{***}$	−.06	.20	(*4*)	4.83	1.65	1.66–8.59
ARO	$-.78^{***}$	$-.75^{***}$	.61	1					$.10^{**}$	$.46^{***}$	.23	2	$.54^{***}$	$-.18^{***}$	.57	4	$-.35^{***}$	$-.15^{***}$	.20	2	5.46	1.25	2.05–8.08
POT	$.22^{***}$	$.60^{***}$	.70	2	$.10^{**}$	$.46^{***}$	.69	2					$.17^{***}$	$.44^{***}$	.53	2	−.02	.09	.20	(*3*)	5.72	0.99	2.70–8.18
AUT	$-.65^{***}$	$-.57^{***}$	.80	3	$.54^{***}$	$-.18^{***}$	.70	3	$.17^{***}$	$.44^{***}$	.38	3					$-.43^{***}$	$-.29^{***}$	.18	1	5.51	1.36	1.87–8.67
COM	$.34^{***}$	−.06	.80	(*4*)	$-.35^{***}$	−.15	.70	4	−.02	$.09^{*}$	.38	4	$-.43^{***}$	$-.29^{***}$	.56	3					4.89	1.43	1.5–8.67
R^2 corr			.80				.70				.38				.57				.20				

Italics indicate no significant correlation by multiple regression analysis. * $.01 < p < .05$, ** $.001 < p < .01$, *** $p < .001$

Table 3 Matrix of bivariate and partial correlations for the 400 positive words: Information about R^2 and stepwise consideration by multiple regression models predicting valence (VAL), arousal (ARO), potency (POT), authority (AUT), and community (COM), including descriptive statistics

	Valence				Arousal				Potency				Authority				Community				Descriptive Statistics		
	Bivariate	Partial	R^2	Step	Bivariate	Partial	R^2	Step	Bivariate	Partial	R^2	Step	Bivariate	Partial	R^2	Step	Bivariate	Partial	R^2	Step	*M*	*SD*	*Range*
VAL					$-.55^{***}$	$-.56^{***}$	.30	1	$.38^{***}$	$.56^{***}$	.14	1	$-.50^{***}$	$-.54^{***}$	.49	2	$.15^{**}$	$-.22^{***}$	.34	2	6.32	0.85	5–8.59
ARO	$-.55^{***}$	$-.56^{***}$	.30	1					.04	$.31^{***}$	.33	3	$.33^{***}$	$-.13^{**}$	.54	4	$-.25^{***}$	$-.19^{***}$	.36	3	4.64	1.05	2.05–7.70
POT	$.38^{***}$	$.56^{***}$	.45	2	.04	$.31^{***}$	.37	2					$.12^{*}$	$.33^{***}$	.54	3	$-.16^{**}$	.04	.36	(*4*)	5.96	0.81	3.48–8
AUT	$-.50^{***}$	$-.54^{***}$	.60	3	$.33^{***}$	$-.13^{**}$	.39	4	$.12^{*}$	$.33^{***}$	.26	2					$-.56^{***}$	$-.54^{***}$	.31	1	4.73	1.13	1.87–7.45
COM	$.15^{**}$	$-.22^{***}$	.62	4	$-.25^{***}$	$-.19^{**}$	.38	3	$-.16^{**}$	.04	.33	(*4*)	$-.56^{***}$	$-.54^{***}$	.31	1					5.28	1.54	1.5–8.67
R^2 corr.			.62				.39				.33			.54						.36			

Italics indicate no significant correlation by multiple regression analysis. Ten example words with the most positive ratings are *friendship* (*Freundschaft*), *love* (*Liebe*), *to hug* (*umarmen*), *home* (*Zuhause*), *tender* (*zärtlich*), *hug* (*Umarmung*), *wisdom* (*Weisheit*), *affection* (*Zuneigung*), *faith* (*Treue*), and *to trust* (*vertrauen*). * $.01 < p < .05$, ** $.001 < p < .01$, *** $p < .001$

Table 4 Matrix of bivariate and partial correlations for the 458 negative words: Information about R^2 and stepwise consideration by multiple regression models predicting valence (VAL), arousal (ARO), potency (POT), authority (AUT), and community (COM), including descriptive statistics

	Valence				Arousal				Potency				Authority				Community				Descriptive Statistics		
	Bivariate	Partial	R^2	Step	Bivariate	Partial	R^2	Step	Bivariate	Partial	R^2	Step	Bivariate	Partial	R^2	Step	Bivariate	Partial	R^2	Step	*M*	*SD*	*Range*
VAL					$-.71^{***}$	$-.76^{***}$	.5	1	$-.14^{**}$	$.53^{***}$	.57	3	$-.39^{***}$	$-.48^{***}$	.36	2	$.34^{***}$	$.17^{***}$	.11	1	3.54	0.91	1.55–4.98
ARO	$-.71^{***}$	$-.76^{***}$	.50	1					$.51^{***}$	$.65^{***}$	.26	1	$.31^{***}$	$-.34^{***}$	.43	3	$-.25^{***}$	−.05	.11	(*3*)	6.17	0.93	3.6–8.08
POT	$-.14^{**}$	$.53^{***}$	.57	2	$.51^{***}$	$.65^{***}$	.67	2					$.50^{***}$	$.57^{***}$	.25	1	−.02	.06	.11	(*2*)	5.51	1.09	2.70–8.18
AUT	$-.39^{***}$	$-.48^{***}$	.67	3	$.31^{***}$	$-.34^{***}$	.71	3	$.50^{***}$	$.57^{***}$	.39	2					$-.14^{**}$	−.04	.11	(*4*)	6.19	1.17	2.87–8.67
COM	$.34^{***}$	$.17^{***}$	.68	4	$-.25^{***}$	−.05	.71	(*4*)	−.02	.06	.57	(*4*)	$-.14^{**}$	−.04	.43	(*4*)					4.55	1.22	1.71–7.89
R^2 corr.			.68				.71				.57				.43				.11				

Italics indicate no significant correlation by multiple regression analysis. Ten example words with the most negative ratings are *betrayal* (*Verrat*), *to humiliate* (*erniedrigen*), *terrorist* (*Terrorist*), *to torture* (*quälen*), *inhumane* (*unmenschlich*), *tyrant* (*Tyrann*), *dictator* (*Diktator*), *humiliated* (*gedemütigt*), *violence* (*Gewalt*), and *paralyzation* (*Lähmung*). * $.01 < p < .05$, ** $.001 < p < .01$, *** $p < .001$

Table 5 Matrix of bivariate and partial correlations for the 295 low-authoritarian (i.e., egalitarian) words: Information about R^2 and stepwise consideration by multiple regression models predicting valence (VAL), arousal (ARO), potency (POT), authority (AUT), and community (COM), including descriptive statistics

	Valence				Arousal				Potency				Authority				Community				Descriptive Statistics		
	Bivariate	Partial	R^2	Step	Bivariate	Partial	R^2	Step	Bivariate	Partial	R^2	Step	Bivariate	Partial	R^2	Step	Bivariate	Partial	R^2	Step	*M*	*SD*	*Range*
VAL					$-.66^{***}$	$-.68^{***}$	.43	1	$.55^{***}$	$.60^{***}$	.30	1	$-.46^{***}$	$-.27^{***}$	.21	1	$.18^{**}$	−.08	.18	(*3*)	6.09	1.25	2.58–8.59
ARO	$-.66^{***}$	$-.68^{***}$	.43	1					$-.12^{*}$	$.38^{***}$	.40	2	$.32^{***}$	.00	.33	(*4*)	$-.18^{**}$	−.09	.18	(*2*)	4.69	1.22	2.05–7.70
POT	$.55^{***}$	$.60^{***}$	.65	2	$-.12^{*}$	$.38^{***}$	.51	2					$-.28^{***}$	−.02	.33	(*3*)	$.12^{*}$	.05	.18	(*4*)	5.67	0.91	3.22–8
AUT	$-.46^{***}$	$-.27^{***}$	.68	3	$.32^{***}$	.00	.51	(*4*)	$-.28^{***}$	−.02	.40	(*4*)					$-.43^{***}$	$-.39^{***}$	.18	1	4.05	0.69	1.87–4.96
COM	$.18^{**}$	−.08	.68	(*4*)	$-.18^{**}$	−.09	.51	(*3*)	$.12^{*}$	.05	.40	(*3*)	$-.43^{***}$	$-.39^{***}$	.33	2					5.80	1.44	1.71–8.67
R^2 corr.			.68				.51				.40				.33				.18				

Italics indicate no significant correlation by multiple regression analysis. Ten example words with the highest egalitarian ratings are *with equal status* (*gleichberechtigt*), *friendship* (*Freundschaft*), *to solidarisize* (*solidarisieren*), *togetherness* (*Miteinander*), *equality* (*Gleichheit*), *social* (*sozial*), *to share* (*teilen*), *solidarity* (*Solidarität*), *socialist* (*Sozialist*), and *fair* (*gerecht*). * $.01 < p < .05$, ** $.001 < p < .01$, *** $p < .001$

Table 6 Matrix of bivariate and partial correlations for the 563 high-authoritarian words: Information about R^2 and stepwise consideration by multiple regression models predicting valence (VAL), arousal (ARO), potency (POT), authority (AUT), and community (COM), including descriptive statistics

	Valence				Arousal				Potency				Authority				Community				Descriptive Statistics		
	Bivariate	Partial	R^2	Step	Bivariate	Partial	R^2	Step	Bivariate	Partial	R^2	Step	Bivariate	Partial	R^2	Step	Bivariate	Partial	R^2	Step	*M*	*SD*	*Range*
VAL					$-.76^{***}$	$-.81^{***}$	.58	1	$.18^{***}$	$.65^{***}$	.30	2	$-.42^{***}$	$-.49^{***}$	.17	1	$.09^{*}$	–.03	.04	(*4*)	4.18	1.43	1.66–7.77
ARO	$-.76^{***}$	$-.81^{***}$	.58	1					$.20^{***}$	$.55^{***}$	.52	3	$.38^{***}$	$-.23^{***}$	.43	3	$-.18^{***}$	$-.13^{***}$	.03	1	5.86	1.07	3.10–8.08
POT	$.18^{***}$	$.65^{***}$	.7	2	$.20^{***}$	$.55^{***}$	.7	2					$.39^{***}$	$.56^{***}$	.40	2	–.07	–.04	.04	(*3*)	5.74	1.04	2.70–8.18
AUT	$-.42^{***}$	$-.49^{***}$	.77	3	$.38^{***}$	$-.23^{***}$	.72	3	$.39^{***}$	$.56^{***}$	.15	1					.01	$.08^{*}$	.04	2	6.67	0.94	5–8.67
COM	$.09^{*}$	–.03	.77	(*4*)	$-.18^{***}$	$-.13^{**}$	.72	4	–.07	–.04	.52	(*4*)	.01	.08	.43	(*4*)					4.42	1.17	1.5–7.92
R^2 corr.			.77				.72				.52				.43				.04				

Italics indicate no significant correlation by multiple regression analysis. Ten example words with the highest authoritarian ratings are *to cage* (*einsperren*), *leading power* (*Führungsmacht*), *interrogation* (*Verhör*), *commander* (*Kommandeur*), *tyrant* (*Tyrann*), *empire* (*Imperium*), *officer* (*Offizier*), *to rule* (*herrschen*), *ruler* (*Herrscher*), and *to torture* (*quälen*). * $.01 < p < .05$, ** $.001 < p < .01$, *** $p < .001$

Table 7 Matrix of bivariate and partial correlations for the 378 high-communal words: Information about R^2 and stepwise consideration by multiple regression models predicting valence (VAL), arousal (ARO), potency (POT), authority (AUT), and community (COM), including descriptive statistics

	Valence				Arousal				Potency				Authority				Community				Descriptive Statistics		
	Bivariate	Partial	R^2	Step	Bivariate	Partial	R^2	Step	Bivariate	Partial	R^2	Step	Bivariate	Partial	R^2	Step	Bivariate	Partial	R^2	Step	*M*	*Sd*	*Range*
VAL					$-.77^{***}$	$-.73^{***}$	.59	1	$.21^{***}$	$.48^{***}$	.04	1	$-.74^{***}$	$-.66^{***}$	.54	1	$.28^{***}$	$-.07^{*}$	.20	3	5.44	1.50	1.92–8.59
ARO	$-.77^{***}$	$-.73^{***}$	.59	1					.05	$.37^{***}$	.15	2	$.50^{***}$	$-.23^{***}$	.64	4	$-.14^{**}$	–.00	.20	4	4.96	1.22	2.15–8.08
POT	$.21^{***}$	$.48^{***}$	.81	3	.05	$.37^{***}$	.63	2					.01	$.35^{***}$	.62	3	$.16^{**}$	$.19^{***}$	.19	2	5.68	0.92	3.11–8.18
AUT	$-.74^{***}$	$-.66^{***}$	.75	2	$.50^{***}$	$-.23^{***}$	.65	3	.01	$.35^{***}$	.23	3					$-.41^{***}$	$-.35^{***}$	.17	1	4.92	1.43	1.87–8.54
COM	$.28^{***}$	–.07	.81	(*4*)	$-.14^{**}$	–.00	.65	(*4*)	$.16^{**}$	$.19^{***}$	.25	4	$-.41^{***}$	$-.35^{***}$	.59	2					6.23	0.87	5–8.67
R^2 corr.			.81				.65				.25				.64				.20				

Italics indicate no significant correlation by multiple regression analysis. Ten examples of the highest communal words are *togetherness* (*Miteinander*), *collective* (*Kollektiv*), *together* (*gemeinsam*), *feast* (*Fest*), *community* (*Gemeinschaft*), *cohesion* (*Zusammenhalt*), *barbecue evening* (*Grillabend*), *social* (*sozial*), *to solidarisize* (*solidarisieren*), and *to work together* (*zusammenarbeiten*). * $.01 < p < .05$, ** $.001 < p < .01$, *** $p < .001$

Table 8 Matrix of bivariate and partial correlations for the 480 low-communal (i.e., individualistic) words: Information about R^2 and stepwise consideration by multiple regression models predicting valence (VAL), arousal (ARO), potency (POT), authority (AUT), and community (COM), including descriptive statistics

	Valence				Arousal				Potency				Authority				Community				Descriptive Statistics		
	Bivariate	Partial	R^2	Step	Bivariate	Partial	R^2	Step	Bivariate	Partial	R^2	Step	Bivariate	Partial	R^2	Step	Bivariate	Partial	R^2	Step	*M*	*SD*	*Range*
VAL					–.75***	–.78***	.56	1	.27***	.68***	.33	2	–.49***	–.54***	.24	1	–.01	.02	.01	(*4*)	4.35	1.60	1.66–8.18
ARO	–.75***	–.78***	.56	1					.12**	.51***	.51	3	.44***	–.19***	.48	3	–.06	–.04	.01	(*3*)	5.85	1.12	2.05–8.02
POT	.27***	.68***	.69	2	.12**	.51***	.67	2					.32***	.55***	.46	2	–.09	–.09	.01	(*1*)	5.75	1.05	2.70–8.07
AUT	–.49***	–.54***	.78	3	.44***	–.19***	.68	3	.32***	.55***	.10	1					.04	.09	.01	(*2*)	5.97	1.10	2.92–8.67
COM	–.01	.02	.78	(*4*)	–.06	–.04	.68	(*4*)	–.09	–.09	.51	(*4*)	.04	.09*	.48	4					3.83	0.72	1.50–4.96
R^2 corr.			.78				.68				.51				.48								

Italics indicate no significant correlation by multiple regression analysis. Ten examples of the highest individualistic words are *career* (*Karriere*), *my/mine* (*mein*), *egoist* (*Egoist*), *genius* (*Genie*), *individualist* (*Individualist*), *pleased with oneself/autocratic* (*selbstherrlich*), *tyrant* (*Tyrann*), *artist* (*Künstler*), *author* (*Autor*), and *individuality* (*Individualität*). * .01 < p < .05, ** .001 < p < .01, *** p < .001

represent a very heterogeneous set of phenomena displaying all kinds of emotional connotations. For instance, they range from very negative concepts such as "tyrant" to positive concepts such as "genius" or "artist." The generally positive correlation between valence and community (evident in the bivariate correlations) displays an interesting dissociation across the ranges of positive and negative words: Significant negative partial correlations are given in the first case ($r_{\text{partial}} = -.22$), but significant positive partial correlations ($r_{\text{partial}} = .17$) in the second, after taking into account the interrelations with, for example, arousal. We interpret this pattern as follows: For the pursuit of happiness, reflected by positive valence, individualistic goals rather than community concerns seem to matter, whereas for generally negative concepts, increasing community levels go along with less perceived negativity—probably reflecting the need of social support when it comes to preventing danger and suffering. In addition, only for the subset of high-community words is a significant partial positive correlation with potency also observed—reflecting the powerful aspect of social support.

Valence Across all seven data sets, the valence dimension shows the highest correlations with the four other dimensions, and the amount of explained variance raises to 80 % for the whole data set (with a lowest value of 62 % in the subset of positive words). Relations to the following three alternative dimensions are stable across all sets und remain relatively unaffected by the entry of alternative predictors: Valence ratings get more negative when concepts are assigned higher arousal levels ($r = -.78$) or higher values of authority ($r = -.65$), but more positive with increasing potency ($r = .22$), except for the case of potency predicting valence in the subset of negative words ($r = -.14$), for which increasing potency leads to more negative evaluations—presumably reflecting increasing threat. Community only reaches significance as an additional predictor in multiple regression models for the two subsets of either positive or negative words (see the section on community).

Arousal Because bivariate and partial correlations with all preceding dimensions have already been discussed, we will focus only on the relation between potency and arousal: Arousal is significantly predicted by potency ratings in all regression models, in that concepts with higher potency are perceived as being more arousing. Notably, this relation is strongest for the subsets of negative ($r = .51$), high-authoritarian ($r = .20$), and individualistic, low-community words ($r = .12$), and is always more pronounced after taking into account the influence of other predictors in multiple regression models, as compared to the bivariate correlations (for the mentioned three data sets, $r_{\text{partial}} > .51$). Thus, especially the potency or power of concepts opposed to pleasant community and equality leads to increasing arousal in the domain of socially relevant concepts. Following valence, the amount of explained variance for arousal ratings reaches the

second highest levels among all dimensions presented here, with values ranging from 39 % for the set of positive words to 72 % for the set of highly authoritarian words.

Potency Potency ratings can be significantly predicted in all but one regression model by the three dimensions of valence, arousal, and authority, increasing with them in a continuous, positive way. Note that the partial correlations always go in the same direction as the bivariate ones, but that the respective correlational strengths always appear more pronounced after multiple regression. The only exception is the subset of low-authoritarian words, in which an initially negative bivariate correlation with authority ($r = -.28$) loses significance after multiple regression ($r_{partial} = -.02$); that is, perceived equality is no longer perceived as being particularly potent once other dimensions, such as valence, have been considered by the model. Only within the range of high-community words are higher potency levels assigned to higher community concepts ($r = .16$). The variance of potency ratings is least well explained for the set of highly communal words (25 %), and best explained for the set of negative words (57 %).

Structure of the database

The database contains the German word (Word_German), its English translation (Word_English), its assignment to different parts of speech (Part_of_Speech: noun, verb, adjective), and the semantic categorization of the word (Semantic_of_Word: characterization, setting, abstract, identity, behavior) to facilitate, for example, appropriate selection of stimuli for experimental use. The database also reports means (MEAN), standard errors (*SE*), and standard deviations (*SD*) for each of the affective dimensions—valence (VAL), arousal (ARO), and potency (POT)—as well as for authority (AUT) and community (COM). Additionally, the database includes the following language statistical measures. Language-based frequency measures were taken from CELEX (freq_CELEX; based on Baayen, Piepenbrock, & Gulikers, 1995), the Leipzig Wortschatz Projekt (freq_Leipzig; Wortschatz Universität Leipzig, 2013), and DLEX (freq_DLEX_norm and freq_DELEX_abs; based on Heister et al., 2011). Additionally the data set provides the Zipf scale's measure of word frequency (freq_Zipf) on a $\log_{10}$ scale (frequency per billion words), which we calculated on the basis of DLEX frequencies and relevant DLEX corpus data (100 million tokens; 2.3 million types). Van Heuven, Mandera, Keuleers, and Brybsaert (2014) recently recommended this new measure of frequency because of its advantages in application and interpretation in psycholinguistic research; for example, the scale goes nearly from 1 to 6/7, where half of the words are below 3 and half are above 3 (for further information, see Van Heuven et al., 2014). A frequency measure reflecting spoken language use was included from SUBTLEX (freq_SUBTLEX), which is a data set based on movie subtitles (Brysbaert et al., 2011). Note that SUBTLEX measures have been reported to predict behavioral measures of language processing especially well (e.g., Brysbaert et al., 2011; Brysbaert & New, 2009; Cai & Brysbaert, 2010; Cuetos, Glez-Nosti, Barbón, & Brysbaert, 2011; Dimitropoulou, Duñabeitia, Avilés, Corral, & Carreiras, 2010; Keuleers, Brysbaert, & New, 2010). Furthermore, the database gives numbers of orthographic neighbors (orth_N_CELEX, orth_N_DELEX) and neighborhood frequencies based on CELEX and DLEX (sum of orthographic neighbors' frequencies: orth_F_SUM_CELEX, orth_F_SUM_DELEX; numbers of higher-frequency neighbors: orth_FHN_CELEX, orth_FHN_DELEX). Next, the data set includes number of letters (#_letters) and number of syllables (#_syllables). Another column contains the number of clusters to which words belong (Cluster). The data set can be downloaded as supplemental materials with this article.

General discussion

With increasing evidence of the influence of the emotional content of words on language processing in general and its modulation through social context, extensive databases that provide emotion-related information about words have become an important tool for research on language processing. However, the available databases (e.g., ANEW by Bradley & Lang, 1999, and its adaptions into various languages, or BAWL by Võ et al., 2009; Võ et al., 2006) have limitations for some research questions, especially those that involve the interrelation between language, emotion, and human social interaction (e.g., Ambrasat et al., 2014; Heise, 2007; Schröder & Thagard, 2013). Therefore, we have provided a linguistic database extending the content of words to the semantic fields of authority and community—which are currently underrepresented in classical databases like ANEW and BAWL, but are necessary for many research topics from the fields of social psychology or sociology. The low overlap—no more than 10 % of words—of our new database, compiled to best represent these semantic fields of social relevance, with previous German databases (BAWL: Võ et al., 2009; Võ et al., 2006; and the German adaption of ANEW: Schmidtke et al., 2014) confirms that socially relevant concepts have not been considered sufficiently in classical databases. Our rating data for affective dimensions correlate highly enough, both with values for overlapping words in the respective German databases and with the data for the English large-scale database of Warriner et al. (2013), to show their general reliability: In particular, the specific focus on authority and community in our material seems not to have biased the general affective ratings for our words. For our repository, besides collecting ratings for the classical emotion dimensions of valence, arousal, and potency, we introduced

two new scales measuring the socially relevant dimensions of authority and community. To investigate the relation of classical emotion dimensions to these novel, explicitly social rating dimensions, we conducted cluster and multiple regression analyses (using all other variables to predict each dimension) within the five-dimensional evaluative space of our data.

As a first interesting finding, we could not replicate the typical boomerang-shaped distribution of the relationship between valence and arousal (Bradley & Lang, 1999; Schmidtke et al., 2014; Võ et al., 2009), in which more extreme values of both positive and negative valence are typically accompanied by increasing arousal. Instead, we found a consistently strong and negative correlation between those two variables across the entire valence range (see Fig. 2; this held true also for the subset of generally positive words alone).

We attribute this specific relation between the two variables in our data to characteristics inherent in the semantic field of socially relevant concepts: Whereas classical databases comprising emotion-laden words of more general types may feature many positive concepts possessing high arousal levels from the semantic fields of joy or thrill, in the domain of sociality, positive evaluation seems instead to be restricted to concepts with the calming potential to maintain social peace and equality. In contrast, arousal or excitation rather seems to represent negatively perceived social threat. Consistently, the two clusters from our cluster analysis that are characterized by the highest levels of arousal also share very low levels of valence: Cluster 2 contains negative, highly arousing, and authoritarian concepts with high potency and mean community ratings, such as "aggressive," "to menace," "to punish," and "to manipulate"; whereas Cluster 6 contains negative, highly arousing concepts with mean potency and authority and low community ratings, such as "unfaithful," "asocial," or "to let down."

Thus, the interrelationship of the three emotion dimensions that describe the affective space of human interaction and

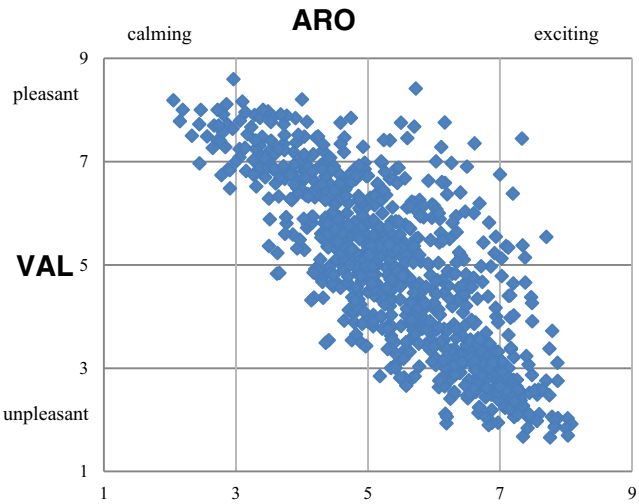

Fig. 2 Correlations of valence and arousal for 858 German words (r = −.78)

communication (Scholl, 2013) is dependent of the underlying semantic fields and subcategories (clusters) that they refer to. Corresponding cultural norms and values can be measured by the well-established affective dimensions of valence, arousal, and potency. However, with regard to a deepened understanding of how society's characteristics are reflected in the affective structure of language, one should also consider basic social dimensions such as authority and community.

Our cluster analysis also allowed us to draw some conclusions regarding the positioning of authority and community within the affective space. For example, we could not find a cluster of words that were at the same time positive and highly authoritarian. This apparently generalized negative evaluation of authority is also mirrored by the correlational analyses, which display a clear negative relationship between these two variables in all ranges of the data set. In contrast, highly authoritarian concepts group into two clusters, one of which includes words that are otherwise mainly neutral, such as "king," "elite," "to govern," and "to judge," with high authority and potency levels but rather neutral levels on all other dimensions (Cluster 1), and the other negative, highly arousing concepts with high potency and mean community values (the above-mentioned Cluster 2). The absence of any positive link between high authority ratings and positive valence evaluation represents an especially interesting contrast between our findings and those of Schneider (2004). Although Schneider theoretically predicted, and mainly confirmed through empirical data, that authorities should be perceived as quite positive, because their power is legitimated by their attributed role identity in a social structure, and at the same time as quite potent and powerful, but not particularly active (e.g., concepts such as *surgeon* or *counselor*), our data only replicates these phenomena concerning the relation between authority and potency—revealing, on the other hand, a clear trend for high authority to be perceived as rather negative, as is evident from the regression analyses and from the words of Cluster 2, and (at least for Cluster 2) also as highly arousing. But note that our multiple regression analyses also capture the generally calming influence of authority, observed in the negative partial correlations with arousal for all subsets but low-authoritarian words—presumably due to authority's role of resolving or opposing social conflict, even though their respective roles might not necessarily be positively evaluated in general.

At the other end of the authority scale, the two clusters with the lowest authority (or the highest equality) levels are at the same time the ones with the highest community levels. This clearly explains why an inverse relation between ratings on the two scales was given across our entire data set, yet was—importantly—absent for both high-authority and low-community words: The low side of the authority scale (equality) goes tightly along with high community, whereas high authority itself appears unrelated to the entire range of community, and the low side of the community scale

(individualistic) has no relation to either authority or equality. But how do perceived equality and community—the observed tight coupling of which seems to match with common sense—relate to the affective space? One of the two relevant clusters displays both the highest valence and the lowest arousal ratings of all clusters, together with medium-to-high potency ratings: Words from this cluster thus describe positive, calming, high-community, relatively potent concepts such as "partner," "to help," "to thank," or "hope." Therefore, unselfish social support and intimate togetherness seem to be perceived as important aspects of equality and community.

The other respective cluster appears to cover a different aspect of how feelings of community and equality emerge: Cluster 4 involves the highest ratings on community, less extreme but still the second lowest authority ratings, and rather neutral values on all other dimensions. We posit that this cluster represents an explicitly antiauthoritarian aspect of community or equality, because these words typically describe the ganging up against authorities as "nongovernmental," "opposition," "left," or "social worker." In sum, these clusters nicely document two differential sources of perceived community or how ratings at the low edge of the equality–authority scale can emerge: They seem to group either (a) high-community concepts without any inherent relation to authority, but a strong adhesion to perceived equality, or (b) explicit antiauthoritarian and, thus, egalitarian and high-community concepts—linking the concept of equality to the philosophical question of "freedom from or freedom for." Note that no single cluster allowed for disentangling the tight relation between low authority and high community ratings, which argues in favor of a natural link of community and equality.

The opposite of community, as implemented in our scale, is individuality. At this extreme end of the scale, we found, again, two clusters. One contains words that are judged to be very individual, positive, and potent (Cluster 5), displaying otherwise medium values of authority and arousal. These concepts can be described as being success- and performance-related—for example, "to achieve something," "to admire," "autonomous," or "scientist." The other highly individual cluster includes words that are perceived to be extremely negative, highly arousing, but rather neutral concerning potency and authority (Cluster 6). These words can be characterized as describing antisocial behaviors—for example, "unsocial," "to abandon," or "ingratitude." In other words, Germans seem to clearly distinguish two facets of individuality: socially accepted individual success due to outstanding performance (e.g., "genius" and "prestige") versus antisocial behavior (e.g., "spoilsport" and "sabotage"). This aligns well with the finding of opposite correlations between community and valence for the two subsets of positive and negative words. Success often involves setting oneself apart from the mass, to become socially visible. Within the range of generally positive words within our database of socially relevant concepts, thus, increasing individuality receives increasingly positive evaluations. But at the same time, individuality should not menace community in potentially dangerous contexts. That is why, in the negative range of words—representing all kinds of threat—we apparently evaluate individualism more negatively.

Consistently, the third and remaining cluster with generally negative valence ratings—displaying also the lowest potency ratings of all clusters, but rather neutral ratings on the remaining three dimensions—contains mostly words like "jobless," "sick person" "handicapped," or "useless." Note that this cluster represents failure and stigma, as opposed to highly individual concepts that could present a threat to community, and is consistently rated as being less negative than Cluster 6, of antisocial behaviors. Last but not least, Cluster 7 could be characterized as the residual cluster, because the ratings on all five dimensions roughly represent the average of their respective scales. Interestingly, this cluster involves many "man on the street" job names, such as "craftsman," "innkeeper," "client," or "electrician." Thus, it appears that who or what represents society's everyday business quietly resides at the unspectacular center of the affective space, whereas all kinds of deviations from descriptive norms of sociality—as addressed by our scales measuring community and authority—evoke pronounced affective reactions in all of the different senses documented in this study.

Note, though, that our data share a critical feature with the huge majority of results published in the domain of psychology: The data were acquired from university students or relatively young participants with a mainly academic background—although in the present study, for which we recruited respondents via mailing lists from different faculties, at least not from psychology students alone. Therefore, as yet, our results and database do not offer a representative report concerning the affective connotations of authority and community across different parts of society. Rather, they represent an intriguing starting point—a snapshot from the German academic environment—and a necessary tool for future research that might explicitly address potential shifts of affective attitudes concerning authority and community across different parts of one society (an approach that we pursue in Ambrasat et al., 2014) or across different cultures.

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