

Electronic Journal of Sociology (1999)

ISSN: 1198 3655



Emergent Clusters of Denotative Meaning

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Schneider@ttu.edu Osgood found that three dimensions — Evaluation (E), Potency (P) and Activity (A) — are the basic dimensions of affective response. The author supposes that social structural properties should be reflected in the affective representation of role-identities. To the extent that Evaluation, Potency, and Activity (EPA) ratings of role-identities are similar, these role-identities share one denotation that should indicate structural implications. K-means cluster analysis is used to create distinct clusters of role-identities with similar EPA profiles. U.S. and German subjects, comparable in age, class, and education, rated role-identities on Osgood's semantic differential scales. For both cultures the cluster analysis of affective meanings identified six clusters. The problem of labeling emergent meaning in explorative cluster analysis is addressed by employing methodological triangulation. Labels for emergent institutional/structural categories are tested with another independent sample.

Role-identities can carry different affective meaning in different cultures. Even though both cultures agree on the definition of a *parent (Elternteil)*, North Americans experience dramatically more potency than Germans (1.95 vs. 0.41 on a -3.33 to 3.33 scale). This paper focuses on methods for comparative inter-cultural research. The main interest is the search for categorizations that allow cross-cultural comparisons on an aggregate level.

Social structure is established by pattern of social behavior. "People doing things together in space and/or time" (Wallace 1983,p.29). Since social components are central in the concept of role-identity, denotative categories of role-identities should reflect structural properties. Affective meaning is determined by cultural structure, the pattern of perception, thinking, or feeling. Affective meaning reflects "people perceiving, thinking, or feeling things together in space and/or time"(Wallace 1983, p.29-30). Social structure and culture are interdependent. Values and beliefs influence socially patterned behavior, just as social structure influences values and beliefs (Wallace 1983). If social structure influences values and beliefs, affective meanings of role-identities should be patterned according to structural properties relevant to role-identities.

Higher order categories of role-identities should denote structural properties. *Fathers, teachers, and judges* can be categorized as authorities; the *father* might also be defined by institutionally his family membership. Trying to avoid imposing categories, I applied an inductive methodology that facilitates

the emergence of categories from the data. 420 Role-identities were rated in South Carolina (Heise 1978) and Mannheim Germany (Schneider 1990) on Osgood's (1962, Snyder and Osgood 1969) evaluation, potency, and activity (EPA) dimensions. These EPA profiles are measures of affective meaning, tested to be cross-culturally comparable (Osgood et al. 1975).

I use an explorative K-means cluster analysis of these EPA profiles to create categories role-identities with similar EPA profiles. Since the major categorizing influence on role-identities are their structural properties and structural properties should influence cultural properties of affective meaning, emerging clusters of EPA profile should indicate structural properties. Role-identities within one cluster should share denotative meaning. One of the problems in this approach is to determine the level of abstraction necessary to reflect denotative meaning. The level of abstraction is directly related to the number of clusters: the higher the number of clusters, the less abstract is the category denoted by the role-identities in the cluster. This translates into the problem of determining the correct number of clusters.

The validity of the cluster solution, the denotative meaning of clusters, is then tested in methodological triangulation using another independent sample. This combination of inductive and deductive methodology not only reveals institutional/structural properties that emerge from affective meaning, but it also validate categories. To the degree to which clusters overlap, cultures agree on denotation. Cross-cultural disagreement is indicated by the degree clusters do not overlap. I will demonstrate how the U.S. and German cultures agree on the authority concept but disagree on the sexual-erotic denotation of role-identities. Even though both cultures agree to a large extent which concepts belong to the denotative category of authority, they diverge in the meaning that they assign to this category. In other words, if both cultures agree on the structural/institutional category of a role-identity, they do not necessarily have to assign the same meaning to this category.

Data And Methods

U.S. Data

Questionnaire data were collected from undergraduates in North Carolina (Heise, 1988), and each role-identity was rated by approximately 56 subjects. The Doubleday Dictionary (Landau, 1975) was used to choose a broad range of general concepts. Here the focus will only be on role-identities.

Like all other sentiments, role-identities are experienced effectively. "Classifications of places, peoples, objects and behaviors get transformed into a domain of feelings, where they lose their qualitative uniqueness, become comparable to one another, and begin obeying quantitative principles" (Heise 1987, p.6). The affective level of these concepts can be measured on the three dimensions of affective meaning. Evaluation (E), potency (P), and activity (A) dimensions reveals that the affective meaning of sentiments is not only *bad* or *good*; they are also *strong* or *weak* and *lively* or *quiet* (Osgood 1962; Osgood et al. 1975). "Psychological evaluation and potency dimensions have their

sociological equivalents in status and power (Kemper 1978, 1987), the activity dimension in social expressivity (Parsons & Shils 1951). EPA profiles can be seen as a metalanguage that sociologically describes differences of emotions and identities. This capacity makes EPA profiles an ideal media for cross-cultural comparisons, especially when multiple languages are involved" (Schneider 1996:126). Poles of the semantic scales for the EPA dimensions were defined by adjectives:

Evaluation: good, nice - bad, awful

Potency: big, powerful - little, powerless

Activity: fast, young, noisy - slow, old, quiet

The order of the EPA scales and the orientation of the scale (left or right) is varied to diminish response biases. Subjects had a "?" category to indicate unfamiliarity with the given concept. Interval scales were used to compute means on all three EPA differential scales.¹

German Data

Blind backtranslation, the reproduction of the U.S. undergraduate with a weighted ratio of German pupils and students, and the similarity of the measurement instrument, secured a high level of comparability of both datasets.

To correspond to the undergraduate population in the U.S., subjects were not only university students but also pupils of the thirteenth grade in "Gymnasium".² About 400 subjects were recruited from Mannheim University and two schools (Gymnasien) in Mannheim, a large industrial city attracting students mainly from the Rhein-Neckar region in former West Germany.

The German study uses the same stimuli and scales as the U.S. study, but employed a more modern measurement technology. The existing U.S. dictionary is used to construct the German stimuli set. U.S. idiomatic concepts like "fuddyduddy" or "hooligan" are dropped. First, a fluent, bilingual native German speaker translates 599 role-identities into German. Then, the method of blind backtranslation (Krebs and Schuessler, 1987) is employed (fig.1). A bilingual native English speaker translates all the German concepts back into English.³ Finally, concepts whose backtranslation matches the original English are selected for further studies. Remaining concepts are examined by North American native English speaker; and words whose backtranslations are synonymous with the original are selected.

Figure One: Schematic of the blind backtranslation process, used to obtain the German stimuli list.

Source: Original list of English role-identities is selected from the U.S. study.

Agent: First bilingual person translated all 599 English role-

identity terms into German.

Result: German translation of English terms.

Source: First German list of 599 role-identities.

Agent: Second bilingual person translates all 599 German role-identity terms into English.

Result: Backtranslated English terms.

Source: Original and backtranslated list of 599 role-identities.

Agent: Native U.S. English speaker compares both English language lists.

Result: 420 role-identities are judged as being identical or synonymous.

The resulting list of 420 well-translated concepts is used as a stimuli list for the data collection in Mannheim (Germany). In this study, every subject has to rate one set of approximately 115 stimuli, which takes about one hour. The upper limit of stimuli, that a subject can handle was determined in a pretest. Here it was indicated that rating 120 stimuli is the threshold where subjects start to get tired.⁴

Attitude: An Interactive Computer Based Instrument

For the German study I used the computer program *Attitude* (Heise and Levis, 1988). *Attitude* is an interactive interviewing program that randomizes the order of stimuli, the orientation of the scale and the order in which the scales are presented. Using the original Pascal⁵ program code, I translated *Attitude*'s introduction, help system and labeling of the scales into German. My translation of the scales profited highly from unpublished material of Charles Osgood.

The labels of the intervals between the points the same as in the U.S. questionnaire method. Corresponding to visual distances on the scale, differences between *neutral*, *leicht* (*slightly*) *ziemlich* (*quite*), and *äußerst* (*extremely*) are coded as differences of 1.0. The differences between the scale endpoints *äußerst* (*extremely*) and *unendlich* (*infinitely*) are coded 1.33, again corresponding to visual scale distances (see Heise and Thomas, 1989, for discussion of the metric assumptions).

Cluster Analysis

Osgood's (1962, Osgood et al. 1975) findings provide evidence for cross-culturally shared affective meaning. EPA dimensions successfully distinguish concepts of affective meaning. I set out to investigate my basic assumption that: to the extent that EPA ratings are similar, corresponding role-identities

share one denotation. The implication is that thresholds for similarity implicitly create boundaries of meaning. Thus, cluster analysis of EPA profiles may be used inductively to investigate the possibility that role-identities, measured on their EPA profiles, form clusters of denotative meaning.

Organizing qualitative concepts according to their quantitative similarity on EPA dimensions of affective meaning profiles establishes a Denotative Cluster of Affective Meaning. These Denotative Clusters of Affective Meaning are higher-order abstractions of Osgood's three dimensions of affective meaning. Clusters denote institutional/structural membership of role-identities and can be seen as basic organizations of cultural structure. This paper demonstrates how a system of Denotative Clusters of Affective Meaning can be explicated and how they are applied in cross-cultural comparison.

K-means cluster analysis establishes sets of EPA ratings that are maximally distinctive across sets, while being maximally homogeneous within sets (Backhaus et al, 1980). "K-means clustering splits a set of objects into a selected number of groups by maximizing between- relative to within-cluster variation" (Wilkinson 1990, p.35).⁹ By selecting the number of clusters, the researcher influences thresholds of similarity.

Determining the right number of clusters is a difficult task asking the researcher to listen to her data. The data cannot speak for itself, but has to be guided through multiple possible solutions to finally deliver emergent categories. The algorithm in fig.2 is used to enhance the emergence of categories from the data.

Figure Two: The algorithm for cluster analysis that is used to enhance the emergence of natural categories from data.

- (1) If clusters are not distinctive in their denotation, use a higher number of clusters.
- (2) If larger numbers of cluster result in single item clusters, one should investigate if heightening the number of clusters will still produce single item clusters. If this is the case the number of clusters should be lowered.
- (3) Accept cluster solutions where cases within clusters hardly vary across solutions with different numbers of clusters, or where clusters split into cases of different denotation.

Results

Cluster Solution

Starting with a few clusters in the first solution, I increase the number of

clusters in steps of one. If additional clusters do not change the existing denotative composition of clusters dramatically, but only result in new single-item clusters, then the upper limit of the number of clusters is determined. Conversely, if choosing fewer clusters does combine role-identities with different denotations into one cluster, the lower end of an interpretable cluster solution is determined.

I explore solutions for four to twelve clusters, each cluster possibly representing one category of meaning. Results in solutions with less than six clusters are not distinctive enough to establish clusters in which role-identities share an unique denotative meaning. On the other hand, solutions with more than six clusters resulted in very small clusters, containing extreme ratings that do not address denotative classes of role identities.

However, not every emergence of a single-item cluster is an indicator that the upper limit of clusters is reached. In my particular example a single-item cluster emerged in the U.S. data. This single-item cluster contained the identity of "God" and might be interpreted as having hyper-authority denotation. Due to its extremity, this one-item cluster established itself very early in the process of increasing the number of clusters. There is another indicator for this exceptional quality of this single-item cluster: even after raising the number of clusters, new clusters established meaningful categories.

The 6-cluster solution using the K-means method in SYSTAT (Wilkinson, 1988) is interpreted as offering the most robust and distinctive clusters for both, the German and the U.S. data. Cluster means of the final six cluster solution are presented in table one and table two."²

Table One: Cluster Means of the German 6 Cluster Solution. Cluster Descriptions of *Winner*, *Deviant*, *Loser* and *Family* are First Tentative Labellings.

German	<i>Winner</i>	<i>Deviant</i>	<i>Loser</i>	<i>Authority</i>	<i>Sexuality</i>	<i>Family</i>
E male	.16	-1.28	-.31	.93	.34	1.40
P male	1.22	.58	-.40	.52	.03	-.52
A male	.79	.88	-.19	.07	.68	.45
E female	.33	-1.01	-.11	1.11	.42	1.23
P female	1.23	.61	-.34	.65	.15	-.26
A female	.72	.77	-.16	.18	.68	.53
n=420	n = 55	n = 83	n = 77	n = 87	n = 81	n = 37

Table Two: Cluster Means of the U.S. 6 Cluster Solution. Cluster Descriptions of *Winner*, *Loser* and *Family* are First Tentative Labellings.

U.S.	<i>Sexuality</i>	<i>Loser</i>	<i>Authority</i>	<i>Winner</i>	<i>God</i>	<i>Family</i>
E male	-1.60	-.41	.97	0.89	3.02	.87
P male	-.31	-1.01	.81	1.25	3.59	-.36
A male	1.04	-.63	-.36	1.13	-.50	1.25
E female	-1.46	-.04	1.15	1.00	3.59	.97

P female	-.01	-.72	.91	1.35	3.59	-.19
A female	.93	-.49	-.22	1.07	-.25	1.10
n=420	n=98	n=74	n=111	n=60	n=1	n=76

Coupling of Qualitative and Quantitative Methodology to Overcome Problems Associated with the Culture Centeredness of the Researcher

Being bicultural, does not necessarily prevent culture-centeredness, it only creates the possibility of committing multiple errors. Since it is more likely to be caught in two cultural traps simultaneously, the researcher experiences dissonant information. This creates enough confusion for the culturally aware researcher to realize the contradiction. Bicultural researchers are caught in a dialectical dilemma (Hegel 1817). Culture-centric theses supported in one culture are contradicted by antithetical information in the other culture. This contradiction, finally, leads to a synthesis. Trusting in one's own bicultural background should not spare the use of proper methodology in cross-cultural research. When emergent properties are interpreted in an inductive approach, all cultures involved should be represented. This can be done either by using a scholarly interpreter of each culture, and/or with secondary data of all cultures.

As a bicultural interpreter of the listing of the U.S. sexual-erotic cluster, I was challenged between interpreting this cluster as deviant or as sexual-erotic. Labeling the U.S. sexual-erotic cluster as deviant proved to be a German culture-centric interpretation. The label sexual-erotic, supported by the second sample of U.S. raters, is demonstrated to be an U.S. culture-centric interpretation. I finally considered the label *vice*.⁸ Vice reflects deviance and sexual-eroticism of the large overlapping component and appears to be less culture-centric. The vice concept is supported by role-identities like *pimp* or *slut* that are located in the overlapping component.

Verification of Denotative Meaning Using Independent Samples

The interpretation of explorative cluster analyses follows a grounded theory approach (Glaser & Strauss 1967), where the structure in the data leads to theoretical reasoning. Reading through the listing of role-identities in an empirically generated cluster is the first step to identifying denotative roots for empirically generated clusters. A similar inductive approach is typically used when factors are named in a factor analytical model. Naming clusters in an explorative cluster analysis, can be seen as labeling emergent meaning. Assigning labels, like *sexual-erotic* or *authoritative*, to empirically generated clusters is an interpretative task for the researcher, and thus a potential source of invalidity.

How should we test the validity of theoretical results that are obtained by inductive reasoning? Strictly speaking, we cannot test theoretical assumptions derived from one set of data with that same set of data. There are several ways to get around this problem. Methods, like bootstrapping (Bollen & Stine 1992), using random sampling of the sample, are not applicable here. Instead, the labeling of the emergent clusters is tested by independent second samples.

The labels authorities, sexual eroticism, family, winner, and losers of the U.S. cluster solution of is tested with North American experts and undergraduate students. The One-Way ANOVA analysis procedure is used to test if the explained variance of the cluster label ratings differ across the six cluster solution. This analysis of variance tests if different means are equal. Finally, it has to be determined if the highest cluster label rating is indeed empirically applied to role-identities in the cluster that initially received this label.

Expert Raters

Twenty-four graduate Ph.D. students who are knowledgeable about the concepts of identity and authority helped to identify denotative meaning of the authority concept. They received a complete list of all 420 role-identities and rated every role-identity as *definitely an authority*, *maybe an authority*, or *definitely not an authority*. ANOVA analysis revealed that all clusters have significantly different ($F=6.43$) authority ratings. The null hypothesis that ratings of authoritativeness are equal in all clusters is clearly rejected in the U.S. cluster solution ($\alpha=.01$). On the average, role-identities in the cluster, that I labeled the authority cluster, also has the highest authority ratings.

As in the case of authority concepts, a second sample is used to test the denotative quality of the sexual-erotic cluster. Again, expert raters received a list of all 420 role-identities, and identified sexual-erotic denotation on a three-point scale: as *definitely sexual-erotic*, *maybe sexual-erotic*, or *definitely not sexual-erotic*.² A Simple factorial ANOVA model shows that mean sexual-erotic ratings are significantly different ($F=11.13$) in each cluster. The null hypothesis that the sexual quality is equal in all clusters is rejected ($\alpha=.01$).

Undergraduate Subjects

The clusters of sexual eroticism and authority were of my greatest theoretical interest (Schneider 1993, 1994, 1996, 1998). They were first tested with expert raters. However, I also want to test the remaining clusters of *family*, *winner*, and *loser*. For this test I used North American undergraduate students. *Family*, *winner*, and *loser* ratings significantly ($\alpha=.01$) differentiated each cluster. The cluster of *winner* also received the highest *winner* rating. In the same pattern, the role-identities of the *family* cluster were rated highest in being a family identity. This did not work for the role-identities of the *loser* cluster.

**Table Three: U.S. Cluster Label Ratings by Clusters.
Alpha of F Values <.01.**

Clusters initially labeled as	Number of subjects	ANOVA (F)	Cluster that received highest rating
authority	24*	6.4	authority
sexual eroticism	16*	11	sexual eroticism

family	46	14	family
winners	13	150	winners
losers	24	133	sexual eroticis

* Each expert rater shared the task of rating the complete set of 420 identities.

The cluster of identities, that I labeled as losers, did in fact receive the highest sexual eroticism rating by U.S. undergraduates. This clearly indicates the need to use empirical verification in the labeling of emergent meaning. Presenting the loser cluster to my graduate seminar, students offered different suggestions for labeling this cluster. If one of these suggestions were accepted, the labeling of emergent meaning in (what I originally called) the loser cluster has to be tested again with a different sample.

Constructing the Ideal Type of Authority

Having established the methodology of generating clusters of denotative meaning, I want to focus on the cluster of authority to demonstrate the usefulness of my methodology in the application of cross-cultural comparison.

The definition of authority in the literature (Weber 1930; Adorno et al, 1950; Barnard 1966; Milgram 1974; Eysenck & Wilson 1978; Giddens 1991) allows an operationalization of the authority concept in terms of EPA profiles. Being coerced is unpleasant, and generally leads to resentment toward the coercer. If the other's coercion is seen as legitimate, then he or she is an authority, and may be evaluated positively. Legitimation of authority means that the authority's power is understood by others, and need not be communicated through expressive actions. The ideal type (Weber, 1946) for an authority is someone who is potent (P+), positively evaluated (E+), and not expressive (A, or A-).

U.S. and German undergraduates largely agree on what they might classify as an authority concept. Authority-clusters in both cultures are quite similar, and 79% of the German authoritative role-identities are represented in the U.S. authority cluster.

Attempted Dichotomization and Trichotomization of EPA Pattern

In the case of authorities there is a simple dichotomous (high and low) EPA pattern. Not every denotative concept is described by such a simple dichotomous or a trichotomous (high, neutral, and low) EPA pattern. If denotative categories would follow simple pattern, it would be much easier to identify them just by using a simple sorting processes. Clusters do not necessarily have extreme means on all three dimensions and are, therefore, harder to spot in the data. Since cluster means are continuous rather than dichotomous or trichotomous, they allow precise borderlines that emerge from the data. Accounting for all variations, cluster analytical classification does

not lose role-identities, even if they do not follow a simple pattern that is identifiable by just looking carefully in the data.

The authority cluster was an interesting exception. Here role-identities in the U.S. data indeed followed a trichotomous scheme of high evaluation, high potency, and neutral ratings in activity. It should be stressed that following this trichotomous EPA pattern the data does not indicate a "better" cluster solution. It only simplifies qualitative interpretation and comparison with the literature.

Qualitative Identification of Cross-cultural Differences in Denotative Meaning

In the cross-cultural analysis of abstract relations between denotative categories, the logical relation of overlapping of meaning becomes relevant. In the comparison of the two cultures multiple categorical membership become possible. This leads to three logical relations in the comparison:

One category of inter-cultural agreement:

Common components: cultures agree on denotative meaning of a concept to the degree to which categories of the same denotative meaning share a common component.

Two Categories of Inter-Cultural Disagreement:

(a) Non-common components: are the remainder of common components. They indicate cross-cultural disagreement in denotative meaning. The term "non-common components" is used if the category of the concept of interest exists in both cultures.

(b) Overlapping components: if the same concept reflects different denotative categories in different cultures, denotative meanings for this category overlaps.

Common components that demonstrate cultural similarity of denotative meaning and overlapping components that represent dissimilarity are represented for the complete six-cluster solutions of the U.S. and German role-identities in a venn diagram in

Focusing only on the authority clusters and the sexual eroticism clusters and their relations, we see cross-cultural similarities and differences in the six cluster solutions of both cultures. For the authority concept we can identify a large common component in which 61% of the 87 German authorities are also categorized as authorities in the U.S. data. Compared to the 25% of German sexual-erotic identities that are classified as sexual-erotic in the U.S., this can be judged as being a large common component.

The large non-common component of the German and U.S. sexual-erotic cluster is an indicator of cross cultural differences in the sexual-erotic domain.

The large overlapping component of the U.S. sexual-erotic cluster with the German deviant cluster is another indicator of cross-cultural differences in the classification of sexual-erotic concepts. The majority (59) of all the U.S. sexual-erotic concepts (98) are categorized as deviant in the German sample.

Authoritative Role-identities of the Common Component

Even when clusters indicate the same denotation, concepts in the clusters are not fully identical. In the cross-cultural comparison, we have to make sure that categories, to be compared, are established by the same concepts. In a cross-cultural comparison the subset of a common component should be used. In the common component, by definition there are the same concepts; therefore, the strength of cross-cultural difference can be fully quantified.

The ideal type of authority, as derived from the literature and operationalized as potent (P+), positively evaluated (E+), and not expressive (A-), is used for cross-cultural comparison. As described above, the authoritative character is tested by a second sample of authority ratings. Another test, if this ideal type is reflected in the authority cluster, can be done in the comparison to role-identities that did not classify as authoritative.¹⁰ Table Three shows that ratings in the German and U.S. authority cluster fulfill the authoritative ideal type significantly (alpha=1%) stronger than the remainder. This is true for both male and female undergraduates. Means indicate that authority clusters show higher evaluation, more potency and less activity than role-identities that are not identified as authoritative.

There are strong cross-cultural differences in the degree to which authoritative-ness of the same role-identity is agreed upon. The affective representation of authoritative role-identities is significantly (alpha=5%) more pleasant and powerful and less active for North Americans than Germans. In this way, ratings of U.S. undergraduates fulfilled the ideal type of authority to a greater extent than the German subjects.

Table Four: German and U.S. Means of the Common Component of Authorities (n=53) and Non-authorities (the Remainder n=275) for Males and Females in Brackets.

Dimensions	German males (females)		U.S. males (females)	
	authority	non- authority	authority	non- authority
Evaluation	0.87 (1.05)	-0.20 (- 0.08)	1.17 (1.37)	-0.38 (- 0.21)
Potency	0.51 (0.64)	0.13 (0.22)	0.88 (0.98)	-0.26 (- 0.02)
Activity	-0.01	0.57	-0.37 (-	0.70

	(0.09)	(0.55)	0.22)	(0.66)
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Sub-cultural Differences as a Measuring Rod for Cross-cultural Differences

It should not be taken for granted that every reader has a language-like comprehension of EPA profiles. It takes quite some experience in working with EPA profiles to actively communicate affective meaning through EPA profiles. Then, corrections in conversations like: "yes, like a *mugger*, but less active" are helpful to bridge cultural barriers between researchers.

Since cross-cultural comparison of EPA ratings might appear abstract to the reader, I want to introduce another measuring rod. Within our native culture, we are intuitively aware of gender differences. I do not want to imply that gender differences are obvious and always available to us, but they are more accessible than cross-cultural differences: especially for those who are not truly bicultural.

Taking the information of table four, I calculated cross-cultural differences for males and females and averaged them. Cross-gender differences on each dimension are averaged in both cultures (see table five). Mean cultural differences are about twice as strong on each dimension as mean gender differences. This suggests that it is twice as hard to understand the authoritative concept in another culture as it is to understand a gender difference in our native culture.

Table Five: Comparing Cultural and Gender Differences of EPA Ratings in the Authoritative Common Component.

Cross-Cultural Differences			Cross-Gender Differences		
males	females	mean	Germany	U.S.	mean
.30	.32	.310	.18	.20	.190
.37	.34	.355	.13	.10	.115
.36	.31	.325	.10	.15	.125

Conclusion

The U.S. data was collected in 1978. Although new partial data collections with undergraduates at Indiana University by Heise and Schneider indicated that sentiments stayed astonishingly stable, the time difference to the German sample endangers the validity of a comparison of both contemporary cultures. However, this article is mainly concerned about the methodology that can be used for cross-cultural comparison and not the qualitative difference in both cultures. In establishing a strong basis for a valid method for cross-cultural comparison of affective meanings and their structural properties, I hope to encourage researchers to collect new data that allow a focus on the nature of

the cross-cultural differences and similarities.

Using the convenient terminology of "German and U.S. culture", I am aware of the limited representativeness of the undergraduate student population. Again, I do not find this limitation relevant for the development of the structural categorization and the development of a methodology for cross-cultural comparison. The reader should judge for herself to which degree she accepts the generalizability of the samples.

Higher order denotations emerge from data on affective meaning. What I call Denotative Clusters of Affective Meaning can be interpreted as structural categories. According to structural symbolic interactionists (Heise 1987, 1998, MacKinnon 1994, Stryker 1992, social structure has an extensive effect on how we create our subjective meaning. So we should not be surprised if macro structural properties are represented within data on affective meaning. I describe a method that identifies such structural meaning in the three dimensional semantic differential ratings of Charles Osgood. Since cultural differences often imply structural differences, my Denotative Clusters of Affective Meaning should vary cross-culturally. Further, their variation in composition can be used as an indicator for cross-cultural differences. If Denotative Clusters of Affective Meaning are used in direct numerical comparison, their composition should not vary. Controlling the cluster composition for cross-cultural comparison, I suggest conducting the comparison within inter-culturally common components.

The basic idea is, to the degree that EPA ratings are similar, corresponding role-identities share one denotation. This idea is tested with German and U.S. data. Cluster analysis is seen as a valid quantitative procedure to translate this theoretical reasoning into a quantitative methodology. Results of both cluster analyses are compared with the initial theoretical assumption that role-identities within clusters carry the same denotation and that the denotation of each cluster will be different. This comparison is tested by a second independent sample, verifying the denotative quality of the cluster.

The authority concept is derived from the literature. After the ideal type of the authoritative role-identity is defined and tested with a second sample, it is compared across cultures by checking which of the cluster means follow this ideal pattern to a greater extent. The emergent trichotomous classification of the authority cluster can be seen as a special case where trichotomous classification was successful. Classifications with cluster analytical methods are far superior to dichotomous or trichotomous classifications where clusters must have extreme means on all three dimensions simultaneously.

Representing cross-cultural agreement and disagreement on denotations. Venn diagrams give an overview of common components and inter-cultural overlapping. Common components indicate cross-cultural agreement in denotative classification. Overlapping components are established by clusters of culturally different denotation. They indicate cross-cultural disagreement in the classification. Non-overlapping categories are another relation that indicates cross-cultural differences in the structural classification. Since

solutions with large overlapping components lead to large sections of overlapping categories, both indicators of cross-cultural differences are positively related.

Common components only control for denotative agreement. Affective meaning within these intercultural categories can still vary. In my exemplary application of the ideal typical EPA pattern of authoritative role-identities, I demonstrate that U.S. subjects followed the EPA pattern to a stronger extent than German subjects.

Differences in the sexual-erotic domain did not come as a surprise. The stigmatization of sexual-erotic concepts in the middle class culture of young North Americans was already identified in other research. Cross-cultural studies of Weinberg et al. (1995), Muehlenhard and Cook (1988) and Schwartz (1993) show that young American subjects stigmatize the sexual-erotic domain. Because of this stigmatization they experience negative emotions of guilt and shame when they confirm their sexual-erotic identities (Schneider 1996, 1999; Schwarz 1993; Weinberg et al. 1995). This was not the case for young Europeans that were compared in these studies.

For some people more surprising was the similarity of the authority concepts in both cultures. Traditionally Germans are stereotyped for their love of authority. This prejudice was scientifically funded in research conducted right after WWII (McGranahan 1946). It was later supported by research on national types (Adorno 1950). Finally, the Milgram Experiment (1969) woke up the academic community and demonstrated that being authoritative is not a German trait. North Americans, with very different social statuses, dramatically demonstrated their obedience to authority.

Just as the Milgram experiment, my study disconfirms the results of early post WWII research on authority. I find that comparing the affective representation of authority in both cultures, young North Americans followed the ideal type of authority just like the German subjects, even a little more. U.S. subjects did assign authorities more power. Despite such high potential for coercion authorities were seen by North Americans slightly more positive. Further, the power of authorities was understood by U.S. subjects to such an extent that there was no need for authorities to expressively communicate their potential potency.

These results are in line with newer findings of the 80s and 90s. In his study of the erosion of institutional authority, Roland Inglehard (1997) uses the concepts of materialism versus postmaterialism. "Postmaterialists feel less need for strong authority than do Materialists. Moreover, Postmaterialists place relatively strong emphasis on self-expression - a value that inherently conflicts with the structure of hierarchical bureaucratic organizations"(p.299). North Americans, for example, were much more confident in the police, and showed substantially more national pride than Germans. Both variables indicate traditional authority. Taking the effects of all indicator variables into account, Inglehard found that North Americans and West Germans increased their dislike for traditional authority from 1981 to 1990. Compared to North

Americans, West Germans not only started 1981 with less preference for traditional authority, West Germans also increased their dislike stronger in the following years.

Combining the findings of Inglehard with previous research on authority in Germany suggests a continuous delegitimation of authorities since WWII. Contrary, one might argue that the ideological stance about the German authority concept, employed by U.S. scientists in early post WWII research, was responsible for a substantial experimenter effect (Rosenthal 1964). If, like in the construction of Adorno's construction of the F-scale, no empirical data of the studied population is used, the potential for an researcher effect is especially high. However, I do not want to fall into a sociology of science mode and examine the potential bias in the early post WWII research in the U.S. For now, I would like to accept the premise that young Germans in the 1940s and 1950s were indeed more willing to attribute power to authorities, to legitimize this power and consequently assign high status to authorities.

Taking this premise, the change of values legitimizing authority in Germany was substantial (Habermas 1977). What were the causes of this change? Cross-cultural differences in the education system can be seen as one possible structural explanation for a change of the authority concept in the German culture. The re-education program in West Germany after World War II (Fischer, 1978; Tent, 1982), imposed by the Allied Forces, initiated a cultural change that influenced attitudes toward authorities. German pupils were systematically encouraged to develop anti-authoritarian standpoints. The curriculum of politics and history classes in the German school system puts an emphasis on the argument that the glorification of authority and the obedience of the masses caused the horror of the Third Reich. Movies of open brain surgery, conducted on living subjects by Nazi physicians, were still used in the 1960s and 1970s as negative conditioners for pupils as early as in the eight grade. The re-education was successful in changing legitimation rules for authorities, and thereby make Germans view their authorities less authoritative.

As reflected in Inglehard's study, the majority of young Americans still engage in a patriotic glorification which does not allow them to self critically reflect upon the legitimacy they assign to their leaders. My results support recent findings in cross-cultural research and seem to indicate a more conservative trend in the U.S. of legitimizing authorities. I argue that since WWII young people in the U.S. did not change their attitudes towards authority as dramatically as Germans. However, it is obvious that the reasons for structural cross-cultural differences are highly complex. Here, I only used one example to illustrate how structural variables differ in both nations, and how these structural differences cause cultural change. The focus of this paper was to establish a sound methodology of cross-cultural comparison and to indicate areas of cross-cultural differences and similarities. Adding more evidence with new methodology, my results might inspire researchers in the fields of philosophy, history, sociology and political sciences to more thoroughly research potential reasons for the cross-cultural differences that I found in my analysis.

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Endnotes

1. Further details on the data collection instrument and a list of all mean ratings by U.S. males and females are available in Heise and Lewis (1988).

2. "Gymnasium" is the German educational equivalent to the U.S. high school, a prerequisite for entering university that lasts two years longer than the U.S. High school. My personal experience in the German "Gymnasium" and "Grundstudium", and my experience teaching U.S. undergraduates informed the construction of a German equivalent of an U.S. undergraduate in Germany. Prof. Frank Banta who taught German at Indiana University was another extremely helpful resource. He was significantly involved in the reformation of the German education system after 1945. Thus, interviewing 143 pupils of the eleventh and twelfth grade of the "Gymnasium", and 294 students of the "Grundstudium" gave a close equivalence of the U.S. undergraduate in age structure and education.

3. Dr. Paul Jackson, assistant professor in the English (Anglistik) department at Mannheim University performed the backtranslation.

4. Herman Smith indicated astonishing cross cultural differences in concentration spans (or in obeying authorities?). In his study of Japanese students (Smith, Takanori, and Umino 1991) he was able to give students the complete list of stimuli, which they willfully rated.

5. Pascal is a registered trademark of Borland International

6. This clustering algorithm is described in detail by Hartigan (1975).

7. A complete listing of the role-identities and their cluster membership in both cultures is provided in Schneider 1997:191-201.

8. The term "vice" is relatively new in the U.S. English language and was, according to Black (1980), first used in the scholarly literature by Schur (1965). Vice is characterized by role-identities engaging in gambling, prostitution, drug abuse and homosexuality (Schur, 1965). Since vice occurs

within a deviant sub-culture often in mutual consensus, it is also referred to as "crime without victim"(Black, 1980).

9. The questionnaire for sexual-erotic denotation of role-identities proves to be an instrument with high validity. In a pretest with twelve graduate students, the wording "sexual" instead of "sexual-erotic" was used. This change of wording, adding "erotic", is suggested by participants of the pretest as more accurate. It avoids the gender denotation of "sex". Because of the wider denotation of sexual, compared to sexual-erotic, role-identities are more likely to classify as sexual than sexual-erotic. As expected, average ratings in the pretest are higher. Specifying "sexual" as "sexual-erotic" has a significant (alpha=1%) effect. Using average sexual ratings of the pretest as a covariate in the ANOVA model, the null hypothesis that ratings of both samples are equal is rejected.

10. Alternatively we might compare cluster means of the authority cluster to dimension means; the EPA means of all concepts. Here we reach similar conclusions.

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Citation Format

Schneider, Dr. Andreas (1999). Emergent Clusters of Denotative Meaning. *Electronic Journal of Sociology*: 4, 2 [iucode: <http://www.icaap.org/iucode?100.4.2.2>]