

**Rough Draft of**

Andreas Schneider and Alden E. Roberts. 2005. "Classification and the Relations of Meaning."  
*Quality & Quantity* 38,5:547-557.

**Classification and the Relations of Meaning**

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## **Classification and the Relations of Meaning**

### **Abstract**

This paper intends to demonstrate the parallels between a qualitative methodology, component analysis, which is predominantly used in cognitive anthropology and linguistics, and the quantitative explorative method—cluster analysis. Social identities and their related structural categories serve as examples of the method. In the methodology and logic involved in the categorization of meaning, abstraction is the key difference between connotative and structural meaning. Abstraction and the identification of higher order categories in cluster analysis are compatible with the extraction of structural meaning from the semantic differential ratings of the affective meanings of identities. The dichotomy of exclusion and inclusion is the most relevant relation for the qualitative analysis of meaning and can be mathematically operationalized by Euclidean squared distance in k-means cluster analysis.

## **Classification and the Relations of Meaning**

This paper intends to demonstrate the parallels between a qualitative methodology, component analysis, which is predominantly used in cognitive anthropology and linguistics, and the quantitative explorative method—cluster analysis. Component analysis is a qualitative method that was developed by Ward Goodenough (1956, 1981), an anthropologist and ethnolinguist. He subjected kinship terminology to component analysis. The method involves what Nida (1975) terms the vertical analysis of meaning. More inclusive meanings of categories are compared with less inclusive meanings. One of the problems faced by component analysis is that meaning and relationships between meanings are multidimensional.

The multidimensionality of component analysis can be demonstrated using an example of social identities. Identities are individual representations of social roles (Darendorf 1965, 1972; Strauss 1994; Stryker 1980; Turner 1962). According to Cooley's (1922) concept of looking-glass self, people observe themselves in the eye of the other. Mead (1934) regarded this reflexivity as a key to developing a self. Internal imaginary interaction between the societal "me" and individual "I" leads to the self-conscious ego called self. Mead distinguished between significant others (those whose opinions are important to a person) and generalized others (the "average" person). The interaction of a person with others, and internal conversations with previous stages of oneself, lead to the development of the self.

However, there are limits to the plasticity of the self. Building the self (Burke 1980; Stryker 1980; Stryker and Burke 2000) through social histories of interaction (Strauss 1994),

social identities reflect the structure of society. Social structure has been conceptualized as social class, exchange networks, role and status sets, or simply repeated patterns of interaction (Ridgeway and Walker 1994). While structuralists have tended to see social structure as stable or even rigid, symbolic interactionists and social cognitive theorists see social structure as negotiated and changed through action and interaction. However, there are limits upon the ability of human cognition to change reality (Howard 1994). Human agency is limited by existing social structure. While psychological changes are relatively easy, the likelihood and speed of change decrease when we move to the social structural and socio-cultural levels (Callero 1994). Indeed, structural meaning is so central for the affective representation of identities, that the social structure serves as a schema for the cognitive classification of identities.

Identities are not purely cognitive reflections of social structure but also affective. This feeling component of identities is important for behavior, attribution, emotions, and the situational acceptance of another identity (Heise 1987; MacKinnon 1994; Osgood 1960, 1962; Osgood et al. 1975; Smith-Lovin and Heise 1988). According to Charles Osgood (1960), affective meaning, as measured by the semantic differential, is connotative meaning. Structural meaning is a higher level of abstraction than connotative meaning. Osgood (1962) found three dimensions of affective response: evaluation (E), potency (P), and activity (A). Items associated with Evaluation include good or bad and bad or awful. Semantic differential items used to measure Potency include big or little and powerful or powerless. Items associated with Activity include fast or slow and young or old. In one of the largest social science research projects ever conducted, Osgood, May and Miron (1975) found evidence for the cross-cultural universality of the EPA dimensions of affective response.

“But why E, P, and A?...the most important question today, as in the day of the Neanderthal about the sign of a thing are: first, is it good or bad for me? (Is it a cute

Neanderthal female or a sabertooth tiger?); second, is it strong or is it weak with respect to me? (Is it a sabertooth tiger or a mouse?); third, is it an active or a passive thing? (Is it a sabertooth tiger or merely a pool of quicksand that I can carefully skirt?) Osgood 1960 [1962]: 247

EPA dimensions are affective responses that are analogues of a social role's status, power, and expressiveness (Heise 1987, 2000; Kemper and Collins 1990; Schneider 2002). Affective response or sentiment arise from structural facts. They are not universal, since different cultures may have different sentiments attached to similar roles.

Interval scales are used to measure EPA. Intervals between the point are labeled as neutral, slightly, quite, and extreme (both positive or negative). They are coded as differences of 1.0 which corresponds to visual distance on the scale. Differences between the scale endpoint of extremely and infinity are coded 1.33 which corresponds to the visual scale distances. Heise (2001) has described how these measurement are administered in internet-based computer interactive interviews.

The multidimensionality of meanings can be demonstrated through the example of judge. More inclusive meanings of categories are compared with less inclusive meanings of identity. The identity of judge is characterized by meanings that include positive evaluation, legitimate power, and composure. Obviously, a judge is a concrete example of the more abstract structural category authority (Schneider 1999a). Authority organizes hierarchical patterns of authority which, in turn, affects social interaction.

One of the major problems in the analysis of meaning is that similarity and dissimilarity have to be determined on multiple levels. On the qualitative side, similarity has to be processed sequentially on multiple dimensions to determine the similarity or dissimilarity of concepts. The quantitative method, cluster analysis, can sort variables or cases into clusters. Variables or units

can be sorted into clusters that are close together. Cluster analysis takes complex data and provides a simple structure. The process of cluster analysis begins with the selection of variables or units. The variables or units are sorted into similar clusters, and the grouping is described and interpreted. K-means cluster analysis specifies the number of homogeneous clusters. If the number of clusters is known a priori through theory or previous research, specification is easy. If the number of clusters is unknown in an explorative analysis, number of clusters can be initially tentatively specified and updated iteratively. Cluster analysis originated in psychology and anthropology in the 1930's and has been used in biology and ecology, economics, geography, management, medical research, political science, psychiatry, and sociology, (Bailey 1975; Everitt 1993; Legendre and Legendre 1998; MacLachan 1992; Stuetzle 1995; Wallace 1978).

Cluster analysis is related to abstraction. The fewer clusters that are formed in an explorative cluster analysis, the more abstract the categories. Conversely, the more clusters that are formed, the less abstract the categories. Researchers are largely unguided in the determination of the number of clusters or the level of abstract that they identify in a cluster analysis. Measurement of similarity or dissimilarity includes measures of association between variables, weighted or unweighted Euclidean distance coefficients, as well as the Mahalanobis generalized distance coefficient. Euclidean distance has been used in multidimensional scaling (Norusis 1993) and as a metric in cluster analysis (Hartigan, 1975; Wilkerson 1990). The average distance of Euclidean  $D$  is superior to some other measures because  $D = 0$  occurs only if two objects are identical on all variables (Bailey 1974). On the other hand, Jardine and Sibson (1971) argue that Euclidean distance is flawed because noncomparable attributes are summarized and all variables do not have the same distribution. Cluster structure is similar to factor structure in factor analysis. Both methods attempt to take unstructured data and discover and describe its

structure. Factor analysis attempts to find a regression of variables upon factors. Cluster analysis uses an analysis of variance format to fit data and reduce unexplained variation (Wallace 1998).

Already in the 1950s, Euclidean distances were used as central measures of social relations. Burt refers to Cronbach and Gleser (1952: 459) who state: “the extent to which individuals  $i$  and  $j$  are involved in identical relations so as to be structurally equivalent can be expressed as the Euclidean distance between their relation pattern” (Cited in Burt 1988: 11). Burt uses data on the unidimensional problem of sociometric density and coefficients based upon Euclidean distance to compare the degree of structural equivalence. Since individuals share structural properties to the extent they share cultural learning, we use cultural rather than sociometric or spatial measures. Euclidean distances have been extensively used in various venues including multidimensional scaling (Norusis 1993) and as a clustering metric in K-means cluster analysis (Hartigan 1975; Wilkinson 1990).

In essence, the logic involved in the qualitative component analysis of meaning parallels the logic of the quantitative method – cluster analysis. Both start with raw data. The raw data in qualitative categorization are symbols; the raw data in cluster analysis are numbers such as the semantic differential ratings of affective meaning. Next the data are extracted. In qualitative data the extraction principle is similarity; in cluster analysis extraction is performed by minimizing Euclidean distance of quantitative data. Finally, the extracted properties in qualitative analysis are abstract categories. The extracted properties in cluster analysis are the mathematically derived clusters. Table 1 summarizes the parallel logic of qualitative and quantitative categorization of meaning.

Table 1 to be placed here

To illustrate the parallel logic of qualitative and quantitative categorization of meaning, we use, extend, and apply the classification of meaning described by Nida (1975: 15): “There are four principal ways in which meaning of differential units by be related to one another: inclusion, overlapping, complementation, and contiguity [exclusion].”

### Inclusion and Equality

In inclusion or equality, concrete meanings are subsumed by more abstract meanings. As an example, authority is more abstract than the concrete term judge. The principle of inclusion is diagramed in figure 1 using Venn diagrams:

Figure 1 to be placed here

Inclusion can be represented mathematically by Euclidean distance. The more the meaning of identities overlap, the smaller the distance of EPA profiles:

$$Distance_{i_1 i_2} = \sqrt{(E_{i_1} - E_{i_2})^2 + (P_{i_1} - P_{i_2})^2 + (A_{i_1} - A_{i_2})^2}$$

- E Evaluation
- P Potency
- A Activity
- i1 identity one
- i2 identity two

E, P, and A are evaluation, potency, and activity, respectively. Identities one and two are symbolized by  $i$  and  $j$ . The Euclidean distance is standardized to ensure comparability across categories. If the EPA profiles are identical,  $D = 0$  and there is equality. Equality is an extension of Nida's (1975) inclusive relation of meaning. In the ideal typical case as illustrated in Figure 1, both circles overlap. As Nida (1975: 26) argues: "meaning consists of that set of necessary and sufficient conceptual features which make it impossible for the speaker to separate the referential potentiality of any one lexical unit from that of any other unit which might tend to occupy part of the same semantic domain." Since the affective meaning of two identities is identical, they carry the same meaning, and it is impossible to distinguish both identities. The relation of equality of meanings is irrelevant for either componential analysis or the cluster analysis of identities.

#### Overlapping

Nida (1975: 16-17) states: "One of the most obvious features of relatedness of meaning is the tendency of meanings to overlap. The words in each pair, normally called synonyms, are almost never substitutable one for the other in any and all contexts. That is to say, they are not identical in meaning, but they do overlap in that they can be substituted one for the other in at least certain contexts without significant changes in the conceptual component of the utterance." If the meaning of identities overlap, they share features responsible for the borderlines that distinguish their meaning from others. The concept of overlapping of meaning of identities is an essential aspect in the cross-cultural comparison of established categories. As an example, identities perceived as deviant in one culture can be seen as sexual-erotic in another culture (Schneider 1996, 1999b). This is represented by the Venn diagrams in Figure 2.

Figure 2 to be placed here

The overlapping of categories of meaning, like inclusion of meaning, can be measured by Euclidean distance. The more inclusive the concepts, the lower the Euclidean distance; the more exclusive the concepts, the higher the Euclidean distance.

#### Exclusion

Exclusion is inversely related to the inclusive relationship of meaning. In terms of the typology: “For the analysis of distinctive feature, or components, of meaning, the relation of contiguity [exclusion] is decidedly most important, since it represents the relation between closely related meanings occupying a well defined, restricted semantic domain, and exhibiting certain well-marked contrasts. That is to say, each meaning is distinctively set off from other related meaning by at least one important feature.” (Nida 1975: 18) As Figure 3 illustrates with Venn diagrams, an exclusive relation appears like a cluster of distinct meanings that share no overlap and are mutually exclusive.

Figure 3 to be placed here

Exclusive relationships of meaning establish classes and are central to both componential analysis and the cluster analysis of meaning. In cluster analysis, the minimization of Euclidean distance leads to homogeneous categories, and the maximization of Euclidean distance results in heterogeneous categories. Cluster analysis does not allow the overlap of meaning that would

lead to dual cluster membership of identities, i.e., it follows the principle of exclusive relations. In exclusive relations, at least one important feature sets off the meaning of identities of one class from identities of another class. As an example, while both authorities and robbers share high potency and can use their power to extract resources from others, authorities are seen as legitimate powers while robbers are stigmatized.

### Complementation

In a complementary relation, features not only have to build borderlines of meaning, as in an exclusive relationship, they also establish opposites as illustrated by the Venn diagrams of Figure 4. As an example, winners and losers are polar opposites much like dead and alive or open and shut (Nida 1974). Only the features, like modifiers or states, of identities can be complementary, not the identities themselves. Even an absolute qualifier such as open and shut or true or false can be seen as relative since something can be slightly open or partially true (Nida 1994).

Figure 4 to be placed here

An ideal case of a complementary relationship is achieved mathematically if the representation of an identity is maximally different in all three dimensions. Complementation is an ideal-typical extreme on the similarity versus dissimilarity scale of meaning, and identities whose meanings stand in complementary relation are not found in empirical reality.

As stressed by Nida (1975), exclusion is the most important relation for a componential analysis of meaning. In building categories, exclusive relations are more appropriate than

complementary relations. However, exclusive relations are more ideal-typical than empirical. Structural categories of identities are abstractions. The higher the level of abstraction of a category, the more features there are in the category, and the more concepts there are that share the features. This leads to a possible overlap of less abstract categories and subcategories.

Both exclusion and complementation may include synonymy, inclusion, and equality. As Figure 5 illustrates, in any given set of identities, all types of relations can exist. This generalization allows for the conceptualization of continuous abstractions of meaning. It also demonstrates the necessity of clearly defining levels of abstraction in both the component analysis of meaning and its quantitative equivalent—cluster analysis. In Figure 5, the smaller circles stand for a lower level of abstraction.

Figure 5 to be placed here

Meanings might be exclusive in a less abstract category, while inclusive in a more abstract category. If levels of abstraction are undefined in either form of analysis, we can encounter multiple relations of meanings simultaneously and seemingly contradictory categories can raise doubt about the validity of the solution. If levels of abstraction are defined in either component analysis or cluster analysis, inclusive relationships become irrelevant. In the case of identities, complimentary relationships do not correspond with empirical reality and can be ignored. The only relationship of meaning that is relevant in the analysis of structural properties of identities is the exclusive relation.

The continuous nature of inclusive and exclusive relations of meaning is demonstrated on a bidirectional scale shown in Figure 6. The overlapping of meaning can be conceptualized as a

hybrid of inclusive and exclusive relations and, for the reason, becomes the centerpoint of the scale. The extreme relations of equality and complementation are in the case of social identities ideal typical and do not occur in empirical reality. Levels of abstraction are predefined in the search for categories. For that reason, all inclusive relationships are irrelevant in categorization. As a hybrid of inclusive and exclusive relations of meaning, the overlapping relation will not exist if levels of abstraction are controlled. Only the exclusive relation of meanings is employed in categorization.

Figure 6 to be placed here

## CONCLUSION

This paper demonstrates the parallels between a qualitative methodology, component analysis, which is predominantly used in cognitive anthropology and linguistics, and the quantitative explorative method—cluster analysis. When controlling for level of abstraction, only the exclusive relation of meanings is relevant for classification. Measures of affective meaning, which encapsulates both connotative and structural meanings, can be seen as minimizing Euclidean distances as a clustering algorithm in explorative cluster analysis.

One of the problems of the induction used in the quantitative technique, cluster analysis, and in qualitative component analysis is that the data do not speak for themselves. As an example, judges, employers, and advisors all share the more abstract structural property of authority. Indeed, judges, employers, and advisors on a higher level of abstraction are all synonymous with authority. While searching for structural categories of meaning, levels of abstraction and relations of meanings have to be understood and controlled.

There is no single a priori statistical indicator that determines the appropriate number of clusters. Analysis of variance is typically used as a standard for the internal validity of a cluster solution. However, to determine the correct number of clusters, additional qualitative and quantitative indicators have to be used. Since these qualitative and quantitative indicators can only be obtained after the analysis is completed, the analysis of structural meaning requires an adaptive process where the results of one computation determine the parameters of subsequent analyses. This process can be summarized by an algorithm:

1. Start the cluster analysis with a few clusters.
2. Observe the indicators for valid and reliable cluster solutions.
  - a. Use Analysis of Variance to seek high and statistically significant F values.
  - b. Analyze structural meaning
  - c. Reassignment of cases: Increasing the number of clusters so the number of clusters does not cause cases to be exchanged between established clusters; instead, cases are assigned to newly-established clusters.
3. Analyze concepts within clusters. If the clusters are not distinctive in their denotations, then use a higher number of clusters.
4. If a larger number of clusters results in single-item clusters, then lower the number of clusters.
5. Keep single item clusters as long as the increase in the number of clusters leads to additional distinctive clusters. Single-item clusters should only be deleted to test the overall stability of the cluster solution.

Starting with a few clusters in the first run, the number of clusters is increased one by one. If additional clusters do not change the existing structural composition of clusters dramatically and only results in new single-item clusters, then the upper limit of the number of clusters is determined. Conversely, if choosing fewer clusters combines identities with different denotations into one cluster, then the lower limit of an interpretable cluster solution is determined. In this dynamic process, identified categories of structural meaning are observed. In the process of increasing the number of clusters, the structural meaning of clusters that were established in prior iterations of cluster analysis have to be reanalyzed. Changes in structural

meaning are dependent upon the way that identities of emerging clusters are recruited from existing clusters.

The more categories that are used to classify identities, the less likely will be that categories of identities share common features. The more categories used in a cluster solution, the more the homogeneity of the connotative meaning of identities in each cluster and the less heterogeneous will be the structural meaning revealed by the clusters. The more categories that can be identified, the more specific the categories. With an interest in structural categories, we try to obtain as few clusters as possible as long as no heterogeneous categories evolve. Locating thresholds in the abstraction of identities can identify important conceptual categories. Conversely, the fewer the categories that can be identified, the more abstract they will be.

## REFERENCES

- Bailey, K. D. (1975). "Cluster Analysis." Pp. 59-128 in *Sociological Methodology 1975*. Edited by David .R. Heise. San Francisco: Jossey-Bass.
- Burke, P. (1980). "The Self: Measurement Requirements from an Interactionist Perspective." *Social Psychology Quarterly* 43:18-30.
- Burt, R. S. (1988). "Some Properties of Structural Equivalence Measures Derived from Sociometric Data." *Social Networks* 10:1-28.
- Callero, P. L. (1994). "From Role-Playing to Role-Using: A Modified Measure of Social Identity." *Social Psychology Quarterly* 57: 228-243.
- Cooley, C. H. (1922). *Human Nature and the Social Order*. New York: Scribner.
- Cronbach, L. J and G. C. Gleser. (1952) . *Similarity between Persons and Related Problems of Profile Analysis*. Urbana: University of Illinois, Bureau of Research and Service, College of Education.
- Darendorf, R. (1965). *Homo Sociologicus*. 15. Edition. Köln: Opladen.
- Everitt, B. S. (1993). *Cluster Analysis*. 3<sup>rd</sup> ed. New York: Halsted Press.
- Goodenough, W. H. (1956). "Componential Analysis and the Study of Meaning." *Language* 32: 195-216.
- Goodenough, W. H. (1981). *Culture, Language and Society*. 2nd ed. Menlo Park, CA: Benjamin Cummings.
- Hartigan, J.A. (1975). *Clustering Algorithms*. New York: John Wiley& Sons, Inc.
- Heise, D. R. (2001). "Project Magellan: Collecting Cross-cultural Affective Meanings Via The Internet." *Electronic Journal of Sociology*. Vol. 5 Number 3
- Heise, D. (1987). "Affect Control Theory: Concepts and Model". *Journal of Mathematical Sociology* 13: 1-33.
- Heise, D. (2000). "Affect Control Theory and Impression Formation." *Encyclopedia of Sociology*, 2nd edition E. Borgatta and M. Borgatta (eds.) New York: Macmillan.
- Howard, J. A. (1994). "A Social Cognitive Conception of Social Structure." *Social Psychology Quarterly* 57: 210-227.

**Comment:** Bailey, Kenneth D. 1975. "Cluster Analysis." Pp. 59-128 in *Sociological Methodology 1975*. Edited by David .R. Heise. San Francisco: Jossey-Bass.

Burke, Peter. 1980. "The Self: Measurement Requirements from an Interactionist Perspective." *Social Psychology Quarterly* 43:18-30.

Burt, Ronald, S. 1988. "Some Properties of Structural Equivalence Measures Derived from Sociometric Data." *Social Networks* 10:1-28.

Callero, Peter L. 1994. "From Role-Playing to Role-Using: A Modified Measure of Social Identity." *Social Psychology Quarterly* 57: 228-243.

Cooley, Charles Horton. 1922. *Human Nature and the Social Order*. New York: Scribner.

Cronbach, Lee J and Goldine C. Gleser. 1952. *Similarity between Persons and Related Problems of Profile Analysis*. Urbana: University of Illinois, Bureau of Research and Service, College of Education.

Darendorf, Ralph. 1965. *Homo Sociologicus*. 15. Edition. Köln: Opladen.

Everitt, Brian S. 1993. *Cluster Analysis*. 3<sup>rd</sup> ed. New York: Halsted Press.

Goodenough, Ward. H. 1956. "Componential Analysis and the Study of Meaning." *Language* 32: 195-216.

Goodenough, Ward. H. 1981. *Culture, Language and Society*. 2nd ed. Menlo Park, CA: Benjamin Cummings.

Hartigan, John .A. 1975. *Clustering Algorithms*. New York: John Wiley& Sons, Inc.

Heise, David R. 2001. "Project Magellan: Collecting Cross-cultural Affective Meanings Via The Internet." *Electronic Journal of Sociology*. Vol. 5 Number 3

Heise, David. 1987. "Affect Control Theory: Concepts and Model". *Journal of Mathematical Sociology* 13: 1-33.

Heise, David. 2000. "Affect ... [1]

- Nicholas, J. and R. Sibson. (1971). *Mathematical Taxonomy*. New York: Wiley.
- Kemper, T. D., and R. Collins. (1990). "Dimensions of Microinteraction." *American Journal of Sociology* 96: 32-68.
- Legendre, P., and Legendre, L. (1998). *Numerical Ecology*. 2<sup>nd</sup> English Edition. Amsterdam: Elsevier.
- McLachan, G. J. (1992). "The Use of Cluster Analysis and Related Techniques in Medicine." *Statistical Methods in Medical Research* 1: 27-48.
- Mead, H. (1934). *Mind, Self and Society from the Standpoint of a Social Behaviorist*, edited by Charles W. Morris. Chicago: University of Chicago Press.
- Nida, E. A. (1975). *Componential Analysis of Meaning*. Paris: Mouton & Co.
- Norušis, M. J. (1993). *SPSS Base System User's Guide*. Chicago Illinois: SPSS Inc .
- Osgood, C. E. (1960). The Cross-Cultural Generality of Visual-Verbal Synesthetic Tendencies. *Behavioral Science* 5, 146-169. Reprinted in: *The Selected Papers of C.E. Osgood*. Charles E.
- Osgood C. E. and O.C.S. Tzeng (Eds.) New York: Centennial Psychology Series 1992, pp.203-234.
- Osgood, C. E. (1962). Studies of the Generality of Affective Meaning Systems. *American Psychologist* 17: 10-28.
- Osgood, C. E., May, W.H. and M.S. Miron. (1975). *Cross-Cultural Universals in Affective Meaning*. Urbana: University of Illinois Press.
- Ridgeway, C. L. and Walker, H. A. (1994). "Status Structures." Pp. 281-310 in *Sociological Perspectives on Social Psychology*. Karen S. Cook, Gary A. Fine, and James S. House (Eds.) Boston: Allyn and Bacon.
- Schneider, A. (1996). "Sexual-Erotic Emotions in the U.S. in Cross-cultural Comparison." *International Journal of Sociology and Social Policy* 16: 123-143.
- Schneider, A. (1999a). "US Neo-Conservatism: Cohort and Cross-Cultural Perspective." *International Journal of Sociology and Social Policy* 19:56-86.
- Schneider, A. (1999b). "The Violent Character of Sexual- Eroticism in Cross-cultural Comparison." *International Journal of Sociology and Social Policy* 18:81-100.
- Schneider, A. (1999c). "Emergent Clusters of Denotative Meaning." *Electronic Journal of Sociology* 4, 2.

- Schneider, A. (2002). "Computer Simulation of Behavior Prescriptions in Multi-cultural Corporations." *Organization Studies*. Forthcoming
- Strauss, A. (1964). *George Herbert Mead: On Social Psychology* Chicago: University of Chicago Press.
- Strauss, A. (1994). Identity, Biography, History, and Symbolic Representations. *Social Psychology Quarterly* 58: 4-12.
- Stryker, S. (1980). *Symbolic Interactionism: A Social Structural Version*. Menlo Park, CA: Benjamin/Gummings.
- Stryker, S. and P. J. Burke. (2000). "The Past, Present, and Future of an Identity Theory." *Social Psychology Quarterly* 63: 284-297.
- Stuetzle, W. (1995). *Data Visualization and Interactive Cluster Analysis*. Ann Arbor, Michigan: ICPSR.
- Turner, R. (1962). "Role-taking: Process versus Conformity?" Pp. 20-40 in *Human Behavior and Social Process*, edited by Arnold M. Rose, Boston: Houghton Mifflin.
- Turner, R. (1973). "The Role and the Person". *American Journal of Sociology* 84: 1-23.
- Wallace, D. L. (1998) "Clustering." Pp. 47-53 in *International Encyclopedia of Statistics*, edited by W. H. Kruskal and J.M. Tanur, Volume 1, New York: The Free Press.
- Wilkinson, L. (1990) *SYSTAT: The System for Statistics, Inc.*

Table 1: The Logic of Qualitative and Quantitative Categorization

	Qualitative Categorization	Quantitative Categorization
Raw Data	Symbols	Affective Meaning measured in semantic differential ratings
Extraction Principle	Feature Similarity	Minimizing Euclidian Distance
Extracted Property	Abstract Categories	Cluster

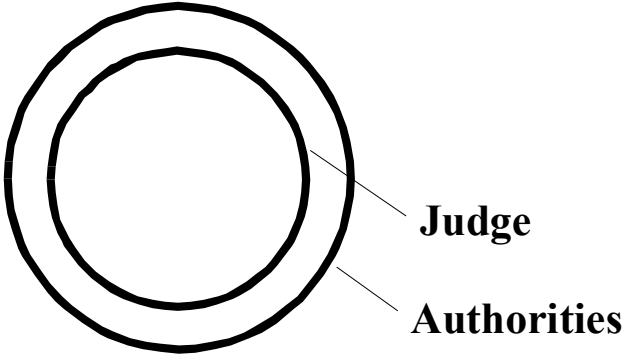


Figure 1: Inclusion of meaning.

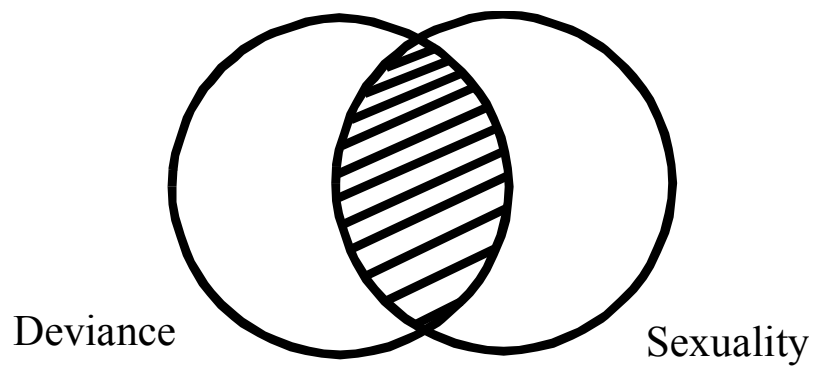


Figure 2: Overlapping of meaning (following Nida 1975, Figure 2)

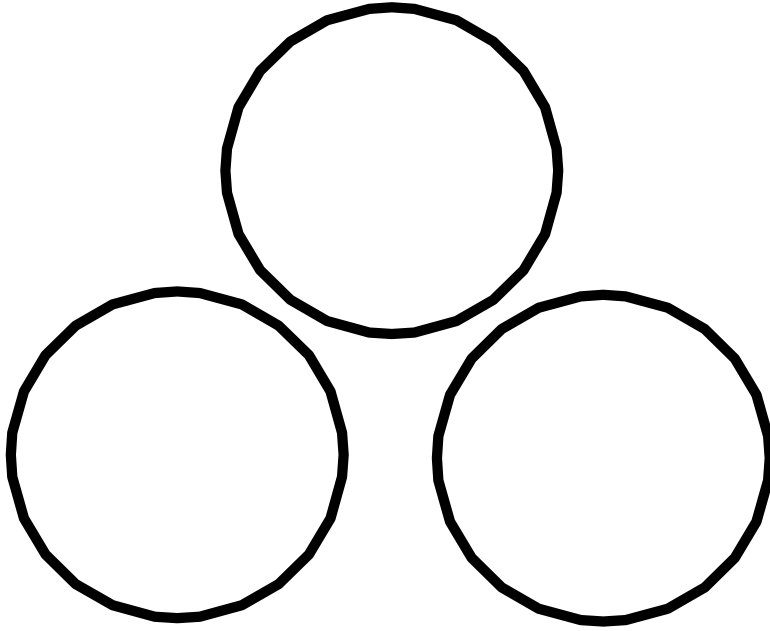


Figure 3: Cluster of exclusive meanings (following Nida 1975, Figure 4), the principle of exclusion.

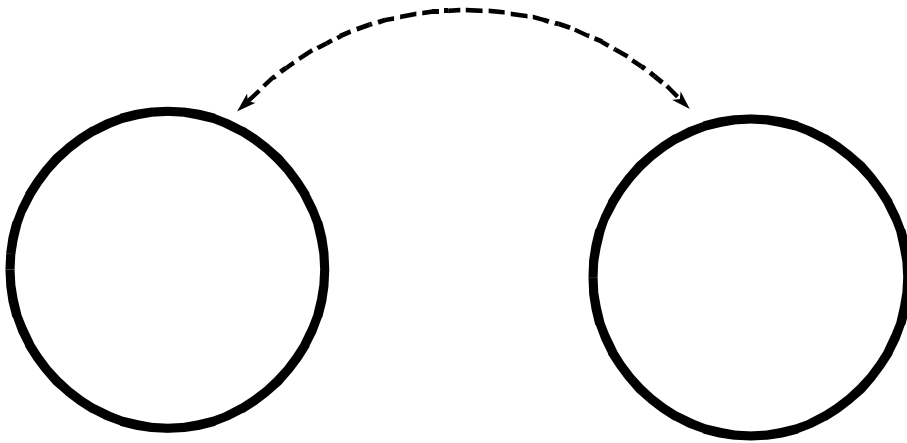


Figure 4: Complementary relations of opposites, reversives, and conversives (following Nida 1975, Figure 3)

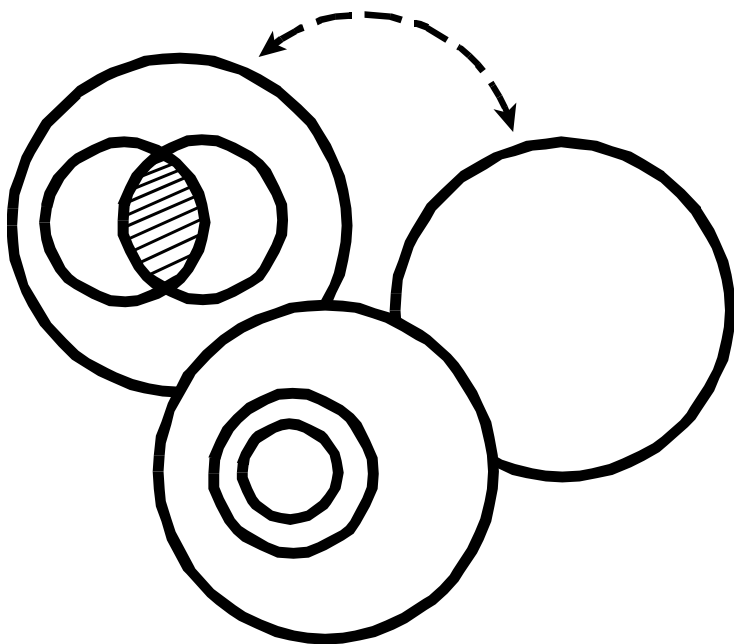


Figure 5: Interdependence of types of relations. Identities can imply multiple structural categories on different levels of abstractions.

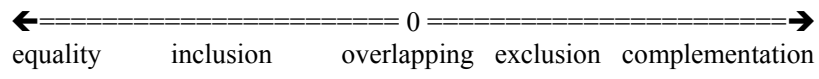


Figure 6: The continuous nature of inclusive and exclusive relations of meaning



- Bailey, Kenneth D. 1975. "Cluster Analysis." Pp. 59-128 in *Sociological Methodology 1975*. Edited by David R. Heise. San Francisco: Jossey-Bass.
- Burke, Peter. 1980. "The Self: Measurement Requirements from an Interactionist Perspective." *Social Psychology Quarterly* 43:18-30.
- Burt, Ronald, S. 1988. "Some Properties of Structural Equivalence Measures Derived from Sociometric Data." *Social Networks* 10:1-28.
- Callero, Peter L. 1994. "From Role-Playing to Role-Using: A Modified Measure of Social Identity." *Social Psychology Quarterly* 57: 228-243.
- Cooley, Charles Horton. 1922. *Human Nature and the Social Order*. New York: Scribner.
- Cronbach, Lee J and Goldine C. Gleser. 1952. *Similarity between Persons and Related Problems of Profile Analysis*. Urbana: University of Illinois, Bureau of Research and Service, College of Education.
- Darendorf, Ralph. 1965. *Homo Sociologicus*. 15. Edition. Köln: Opladen.
- Everitt, Brian S. 1993. *Cluster Analysis*. 3<sup>rd</sup> ed. New York: Halsted Press.
- Goodenough, Ward. H. 1956. "Componential Analysis and the Study of Meaning." *Language* 32: 195-216.
- Goodenough, Ward. H. 1981. *Culture, Language and Society*. 2nd ed. Menlo Park, CA: Benjamin Cummings.
- Hartigan, John A. 1975. *Clustering Algorithms*. New York: John Wiley & Sons, Inc.
- Heise, David R. 2001. "Project Magellan: Collecting Cross-cultural Affective Meanings Via The Internet." *Electronic Journal of Sociology*. Vol. 5 Number 3
- Heise, David. 1987. "Affect Control Theory: Concepts and Model". *Journal of Mathematical Sociology* 13: 1-33.
- Heise, David. 2000. "Affect Control Theory and Impression Formation." *Encyclopedia of Sociology*, 2nd edition E. Borgatta and M. Borgatta (eds.) New York: Macmillan.
- Howard, Judith A. 1994. "A Social Cognitive Conception of Social Structure." *Social Psychology Quarterly* 57: 210-227.
- Jardine, Nicholas, and Robin Sibson. 1971. *Mathematical Taxonomy*. New York: Wiley.

Kemper, T. D., and R. Collins. (1990). "Dimensions of Microinteraction." *American Journal of Sociology* 96: 32-68.

Legendre, Pierre, and Legendre, Louise. 1998. *Numerical Ecology*. 2<sup>nd</sup> English Edition. Amsterdam: Elsevier.

McLachlan, Geoff J. 1992. "The Use of Cluster Analysis and Related Techniques in Medicine." *Statistical Methods in Medical Research* 1: 27-48.

Mead, Herbert. 1934. *Mind, Self and Society from the Standpoint of a Social Behaviorist*, edited by Charles W. Morris. Chicago: University of Chicago Press.

Nida, Eugene A. 1975. *Componential Analysis of Meaning*. Paris: Mouton & Co.

Norušis, Marija J. 1993. *SPSS Base System User's Guide*. Chicago Illinois: SPSS Inc .

Osgood, Charles E. 1960. The Cross-Cultural Generality of Visual-Verbal Synesthetic Tendencies. *Behavioral Science* 5, 146-169. Reprinted in: *The Selected Papers of C.E. Osgood*. Charles E. Osgood and Oliver C.S. Tzeng (Eds.) New York: Centennial Psychology Series 1992, pp.203-234.

Osgood, Charles H. 1962. Studies of the Generality of Affective Meaning Systems. *American Psychologist* 17: 10-28.

Osgood, Charles, May, W.H. and M.S. Miron. 1975. *Cross-Cultural Universals in Affective Meaning*. Urbana: University of Illinois Press.

Ridgeway, Cecilia L. and Walker, Henry A. 1994. "Status Structures." Pp. 281-310 in *Sociological Perspectives on Social Psychology*. Karen S. Cook, Gary A. Fine, and James S. House (Eds.) Boston: Allyn and Bacon.

Schneider, Andreas. 1996. "Sexual-Erotic Emotions in the U.S. in Cross-cultural Comparison." *International Journal of Sociology and Social Policy* 16: 123-143.

Schneider, Andreas. 1999a. "US Neo-Conservatism: Cohort and Cross-Cultural Perspective." *International Journal of Sociology and Social Policy* 19:56-86.

Schneider, Andreas. 1999b. "The Violent Character of Sexual- Eroticism in Cross-cultural Comparison." *International Journal of Sociology and Social Policy* 18:81-100.

Schneider, Andreas. 1999c. "Emergent Clusters of Denotative Meaning." *Electronic Journal of Sociology* 4, 2.

Schneider, Andreas. 2002. "Computer Simulation of Behavior Prescriptions in Multi-cultural Corporations." *Organization Studies*. Forthcoming

Strauss, Anselm. 1964. *George Herbert Mead: On Social Psychology* Chicago: University of Chicago Press.

- Strauss, A. (1994). Identity, Biography, History, and Symbolic Representations. *Social Psychology Quarterly* 58: 4-12.
- Stryker, Sheldon. 1980. *Symbolic Interactionism: A Social Structural Version*. Menlo Park, CA: Benjamin/Gummings.
- Stryker, Sheldon and Peter J. Burke. 2000. "The Past, Present, and Future of an Identity Theory." *Social Psychology Quarterly* 63: 284-297.
- Stuetzle, Werner. 1995. *Data Visualization and Interactive Cluster Analysis*. Ann Arbor, Michigan: ICPSR.
- Turner, Ralph. 1962. "Role-taking: Process versus Conformity?" Pp. 20-40 in *Human Behavior and Social Process*, edited by Arnold M. Rose, Boston: Houghton Mifflin.
- Turner, Ralph. 1973. "The Role and the Person". *American Journal of Sociology* 84: 1-23.
- Wallace, David. L. "Clustering." Pp. 47-53 in *International Encyclopedia of Statistics*, edited by W. H. Kruskal and J.M. Tanur, Volume 1, New York: The Free Press.
- Wilkinson, Leland. 1990 *SYSTAT: The System for Statistics, Inc.*