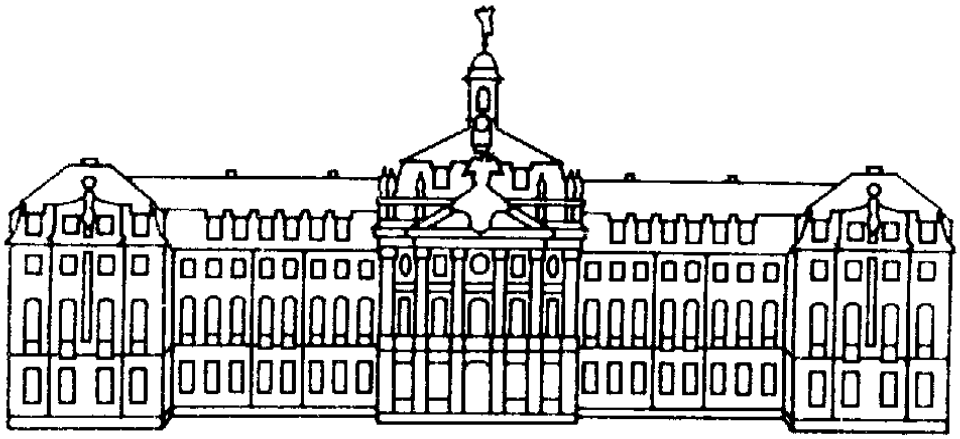

Online Assessment of Value Preferences by Paired Comparisons

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Online Assessment of Value Preferences by Paired Comparisons

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and

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Abstract

The importance of personal values has usually been investigated by ranking or by rating procedures. We used an alternative approach in a series of online studies: Subjects received a total of 45 graded paired comparison tasks. On each trial, two of the ten value types proposed by Schwartz (1992) were presented. Subjects were asked to indicate the degree to which one value type is more important than the other. To validate this approach, the resulting importance scores were correlated with scores from an online version of Schwartz' Portrait Values Questionnaire (PVQ). In addition, structural analyses, including a "weak-confirmatory" MDS approach (Borg & Staufenbiel, 2007), were conducted to examine whether and to what extent data from the paired comparison task match Schwartz' assumptions about the structure of human values. The central findings of these analyses are presented.

Introduction

From a personality perspective, values are regarded as dispositions. As such, they are characterized by ‘relative stability’. On closer examination, however, values can be discriminated from other dispositional constructs like traits, attitudes, or motives by a compound of distinguishing features. In contrast to these constructs, values are usually characterized as (a) concepts or beliefs (b) about desirable end states or behaviours (c) that transcend specific situations, (d) guide the selection or evaluation of behaviours or events, (e) and are ordered by relative importance (Schwartz & Bilsky, 1987; Bilsky & Schwartz, 1994). In other words, values are *goal oriented* cognitions of *relative importance* that are supposed to *direct* a person’s behaviour *in the long run*.

Relative importance is of particular interest with respect to the theory and the assessment of values. Following Allport and Vernon (1931), Rokeach (1973), and Schwartz (1992), values are organized in systems. Within these systems, the relative importance of a single value results from its compatibilities and incompatibilities with all other values, i.e. from the dynamic organization of the whole value system (Schwartz, 1992). This ipsative perspective on values has consequences with respect to value assessment. Thus, apart from rating scales, ranking and sorting tasks have been

common and prominent approaches for measuring value preferences in the past (e.g., Rankin & Grube, 1980; O'Reilly, Chatman & Caldwell, 1991). Paired comparisons, in contrast, have rarely been used for these purposes (see Oishi, Schimmack, Diener & Suh, 1998, Oishi, Hahn, Schimmack, Radhakrishan, Dzokoto & Ahadi, 2005, for an exception). This is so because the number of comparisons rises dramatically when values to be compared exceed about a dozen. On the other hand, the paired comparisons method is the most direct and straight-forward approach for measuring preferences.

While these limitations are crucial when working at an item level, they should be less important when considering a limited number of broad value categories. Schwartz (1992) offers such categories by specifying ten value types. According to their mutual compatibilities and incompatibilities, these value types span a two-dimensional space: "self-transcendence vs. self-enhancement", and "openness to change vs. conservation" (Schwartz, 1992). Table 1 gives an overview of the value types, and of the underlying value dimensions. Figure 1 shows the circular structure of the ten value types which results from their mutual compatibilities and incompatibilities.

Based on Schwartz' values theory (1992), we show in the following how value preferences can be assessed economically by paired comparisons of the ten value types. This is accomplished by describing the development of the *Computerized Paired Comparison of Values* (CPCV), its online application to a sample of N = 321, and the computation of mean value type scores. Correlations between these CPCV scores and the respective scores of an online version of the *Portrait Values Questionnaire* (PVQ; Schwartz, Melech, Lehmann, Burgess, Harris & Owens, 2001) are reported as evidence for the concurrent validity of the paired comparison approach. In addition, structural analyses are presented in support of the construct validity of the CPCV.

Table 1 Basic value dimensions “self-transcendence vs. self-enhancement” and “openness to change vs. conservation” (Schwartz, 1992, 2005).

Higher-Order Values	**Value Types**
Self-transcendence Transcending one's selfish concerns and promoting the welfare of others, close and distant, and of nature.	**1 Universalism.** Understanding, appreciation, tolerance, and protection for the welfare of all people and for nature. **2 Benevolence.** Preserving and enhancing the welfare of those with whom one is in frequent personal contact (the 'in-group').
Conservation Preserving the status quo and the certainty it provides in relationships with close others, institutions, and traditions.	**3 Tradition.** Respect, commitment, and acceptance of the customs and ideas that traditional culture or religion provide the self. **4 Conformity.** Restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms. **5 Security.** Safety, harmony, and stability of society, of relationships, and of self.
Self-enhancement Enhancing one's own personal interests (even at the expense of others).	**6 Power.** Social status and prestige, control or dominance over people and resources. **7 Achievement.** Personal success through demonstrating competence according to social standards.
	8 Hedonism. Pleasure and sensuous gratification for oneself.
Openness to change Pursuing whatever intellectual or emotional directions one wishes, however unpredictable or uncertain the outcomes.	**9 Stimulation.** Excitement, novelty, and challenge in life. **0 Self-Direction.** Independent thought and action; choosing, creating, exploring.

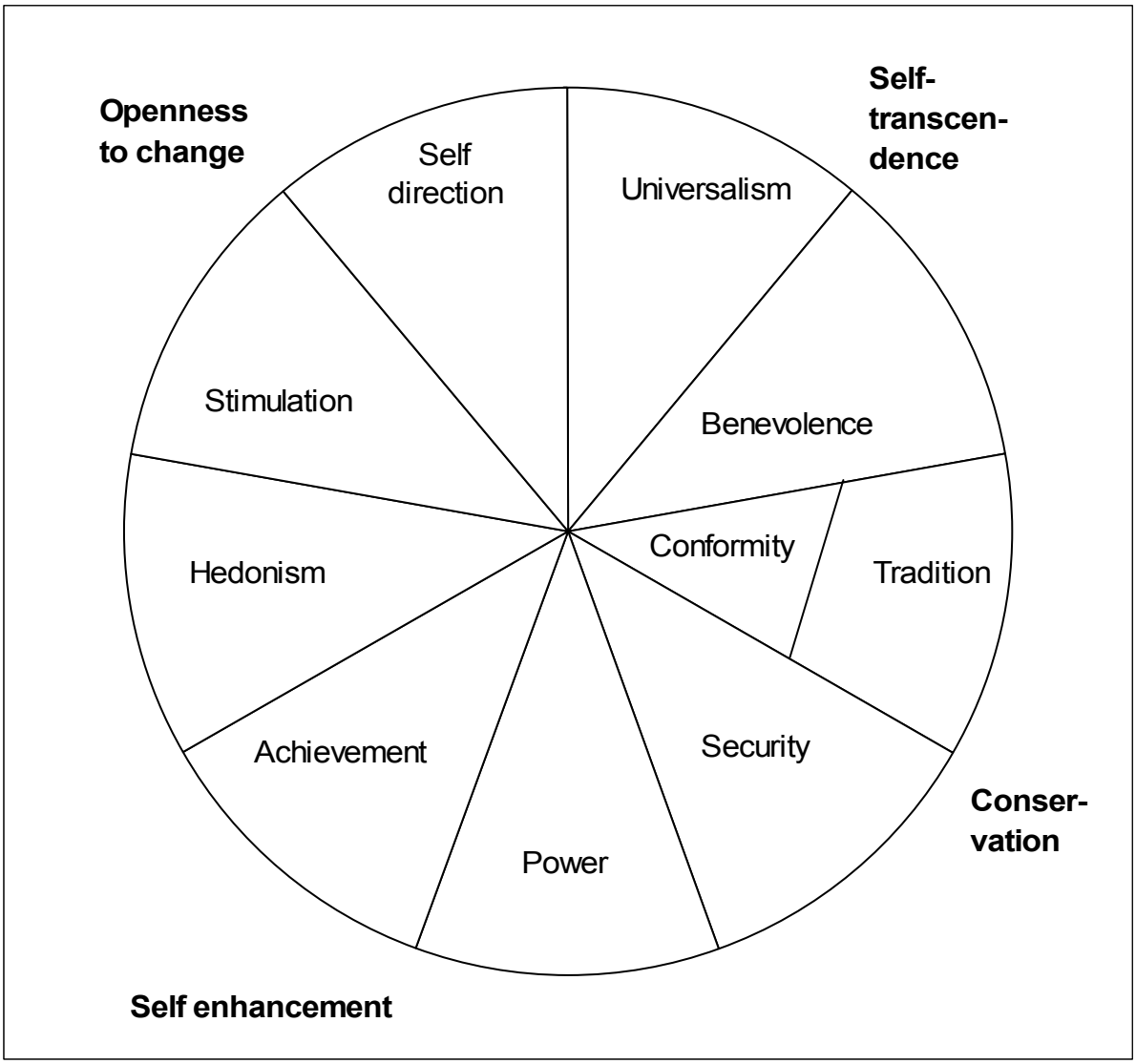

Figure 1 Circular structure of value types according to their mutual compatibilities and incompatibilities (Schwartz, 1992)

Method

Paired Comparisons

Pilot studies. In order to make sure that the participants of our study understand the distinct meanings of the ten *value types* to be compared on the 45 consecutive trials of the paired comparison task, these values had to be introduced in a clear and economic way. In two preliminary (test) versions of the CPCV, we tried to accomplish this objective by presenting the value types together with the respective items of the Schwartz Value Survey (SVS): In our *first* pilot study (N = 82) *all items* of the respective value

type were presented; in the *second* study (N = 81) only the *three cross-culturally most characteristic items* were shown (Schwartz & Sagiv, 1995). While the basic two-dimensional value structure could be verified in both studies (Brocke & Bilsky, 2005), some neighboured value types changed their places as compared to the ideal structure (Figure 1). Furthermore, the rank order of the mean value type scores computed for these versions of the CPCV differed partially. Scanning the response latencies, we found that part of our subjects obviously ignored the detailed information presented on each screen. Therefore, to control for information overflow, we ran a *third* pilot study (N = 130), presenting *only the value types* to be compared, without further information. Once more, the basic two-dimensional structure could be identified, but the sequence of value types showed again deviations from the hypothesized circular structure. Drawing on the feedback received from participants and on our own observations, the mere presentation of value type labels was obviously not sufficient to avoid semantic ambiguities. Evidence for this interpretation was only indirect but consistent with the results from our pilot studies.

The final instrument - the CPCV. As a consequence of our prior findings, we decided not to use marker items but short *descriptions of the motivational content* when introducing and comparing the ten value types. These descriptions were taken from a German adaptation of Schwartz' definitions of the ten value types (Boehnke & Welzel, 2006). In its final form, the *CPCV* consists of 47 consecutive chunks of information, separately projected on the screen. Two of them relate to instructions, and 45 to the paired comparisons. To avoid order effects, the sequence of comparisons was randomized between participants. Furthermore, the side on which a value type appeared within a paired comparison (left or right side of the screen) was also randomized. Figures A1 - A3 in the appendix are exemplary screenshots of the *CPCV*.

Sample

The Participants of our main study were students of psychology, enrolled at the universities of Münster and Hamburg. Altogether, N = 321 subjects participated in completing our instruments. The sample was biased with respect to gender, comprising 39 male and 282 female students. Their mean age was 24.1 (males) and 22.1 (females), respec-

tively. They participated in our study in compliance with the requirements of the local study guidelines.

Data Collection and Value Indicators

All information of our study was administered online. Instructions were chunked into homogeneous blocks of information and presented step by step on successive screens. Basic demographic information (age, gender, and nationality) was collected in a standardised form. Value preferences were assessed with two distinct instruments, the *Computerized Paired Comparison of Values* (CPCV) and on online adaptation of the *Portrait Values Questionnaire* (PVQ). The sequence of the CPCV and the PVQ was randomized. Both, individual responses and response latencies were registered automatically. The anonymity of the participants was guaranteed by the use of self-chosen codes.

In order to compute *CPCV importance scores* for the ten value types, responses of the participants were transformed into numerical scores on a first step, ranging from -3 (left value much more important), -2 (left value more important), -1 (left value slightly more important), +1 (right value slightly more important), +2 (right value more important) to +3 (right value much more important). On a second step, those scores of the paired comparisons were aggregated which related to the same value type. Given nine dual comparisons, importance scores range from -27 to +27. It should be noted that each paired comparison counts twice, i.e. for both values displayed. As a consequence, the mean of all *CPCV importance scores* is zero for each participant. Centring of scores in order to control for response styles is not necessary therefore.

The 40-items version of the *Portraits Value Questionnaire* (PVQ-40) was administered as a second measure for assessing value preferences. Again, items were displayed randomly to avoid order effects. Response alternatives ranged from -3 (not at all like me) to +3 (very much like me) on a six-point scale. Depending on their gender, participants received either the male or the female version of this instrument. *PVQ importance scores* were computed by averaging item responses of the same value type. In addition, *centred PVQ importance scores* (i.e., ipsative scores, PVQi) were computed to correct for individual response tendencies. Computation of these scores was accomplished by subtracting the individual's mean score on all 40 PVQ-items from each of his/her 10 PVQ importance scores (cf. Schwartz, 2005).

Data analysis

Value data were examined in four different steps in order to investigate the validity of our computerized paired comparison approach. First, zero-order (PMK-) correlations were computed between the CPCV- and the PVQ/PVQi-importance scores. Second, rank-order correlations (Spearman-Rho) were computed between the ranks of the ten value types, corresponding to the CPCV- and the PVQi-importance scores. Third, structural analyses were performed separately for CPCV- and for PVQ-importance scores. This task was accomplished by applying *weak confirmatory Multidimensional Scaling* (MDS; Borg & Staufenbiel, 2007) to the value data, using a *starting configuration* derived from Schwartz' original ten sectors model of value structure (Schwartz, 1992, p. 14; see Bilsky, Gollan & Döring, 2007, for a general description of this approach).[1] Figure 2 shows a plot of this starting configuration. Finally, Multi-Trait-Multi-Method (MTMM) matrices of the CPCV-variables, and the PVQ- and PVQi-variables, respectively, were analyzed in a joint MDS (Borg & Groenen, 1997) to investigate whether both data sets can be represented by the same structural model. All analyses were run with SPSS-15, using the PROXSCAL module for computing ordinal MDS.

[1] A recent analysis of PVQ-data, collected within the context of the European Social Survey (ESS1; Janik, 2008), yielded a good match between the ESS value data and Schwartz' original ten sectors model of value structure (1992, p. 14). From this model, an MDS starting configuration can be easily derived for analyzing MTMM matrices.

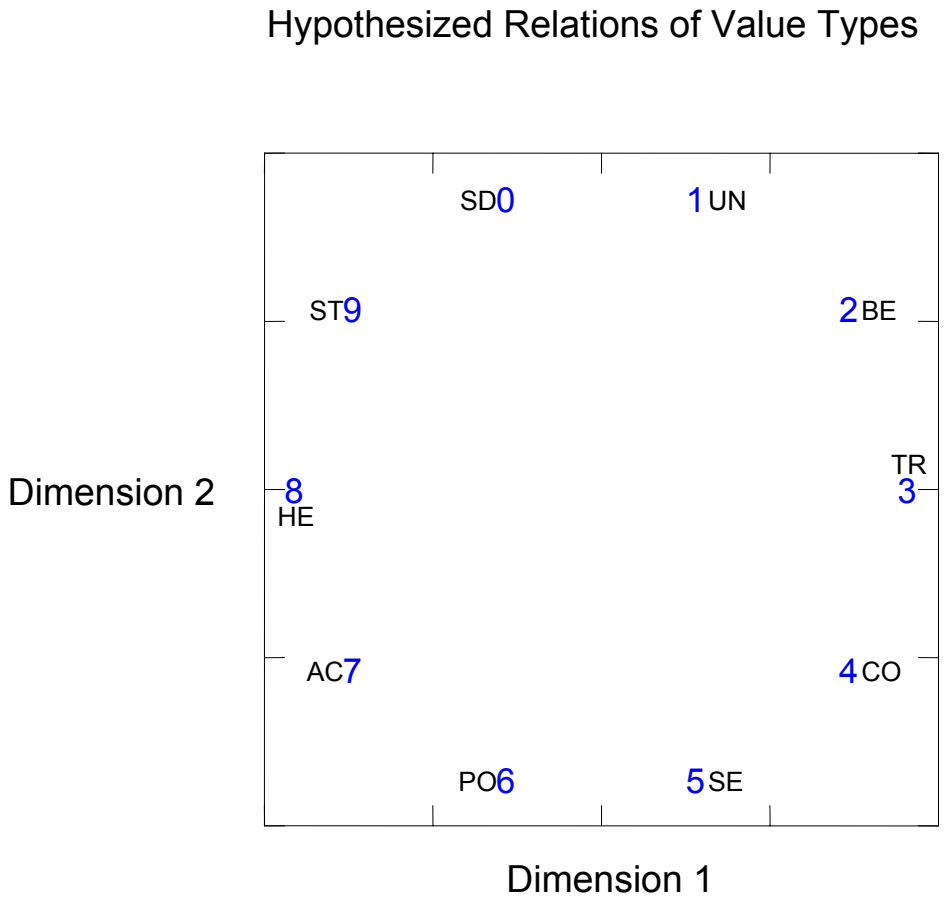

Figure 2 Starting configuration used in weak confirmatory MDS of value types (cf. Bilsky, Gollan & Döring, 2007)

Universalism=UN (1)	Benevolence=BE (2)	Tradition=TR (3)	Conformity=CO (4)
Security=SE (5)	Power=PO (6)	Achievement=AC (7)	Hedonism=HE (8)
Stimulation=ST (9)	Self-Direction=SD (0)		

Results

Zero-order correlations. Correlations between the *CPCV importance scores* and the PVQ are presented in Tables 2a and 2b: Table 2a includes the correlations with the *PVQ importance scores* (PVQ), Table 2b includes those with the *centred PVQ importance scores* (PVQi).

Table 2a Correlations between CPCV- and PVQ-Items; N = 321

PVQ / CPCV	Universalism	Benevolence	Tradition	Conformity	Security	Power	Achievement	Hedonism	Stimulation	Self-Direction
Universalism	,595	,144	,010	-,077	-,137	-,349	-,337	-,095	,059	,141
Benevolence	,199	,395	,123	,081	,159	-,382	-,258	-,052	-,106	-,087
Tradition	-,004	,059	,506	,211	,204	-,232	-,162	-,105	-,188	-,306
Conformity	-,237	,084	,172	,291	,364	,005	,166	-,213	-,292	-,340
Security	-,146	-,128	,093	,112	,449	,048	,156	-,109	-,317	-,179
Power	-,396	-,377	-,211	-,238	-,092	,576	,428	,024	,116	,149
Achievement	-,293	-,208	-,221	-,132	,033	,356	,522	-,074	-,035	,038
Hedonism	-,057	-,014	-,080	-,124	,009	-,082	-,227	,338	,312	-,051
Stimulation	,051	-,045	-,014	-,255	-,318	,014	-,200	,080	,571	,155
Self-Direction	,211	-,205	-,103	-,264	-,294	,019	-,093	-,011	,281	,497

Table 2b Correlations between CPCV- and centered PVQ-Items (PVQi); N = 321

PVQi / CPCV	Universalism	Benevolence	Tradition	Conformity	Security	Power	Achievement	Hedonism	Stimulation	Self-Direction
Universalism	,667	,199	-,015	-,045	-,209	-,396	-,389	-,059	,038	,160
Benevolence	,202	,478	,107	,116	,111	-,408	-,299	-,015	-,150	-,099
Tradition	-,020	,098	,499	,284	,160	-,228	-,171	-,070	-,204	-,320
Conformity	-,272	,100	,164	,355	,350	,017	,179	-,198	-,334	-,371
Security	-,198	-,120	,072	,184	,493	,074	,188	-,091	-,419	-,220
Power	-,419	-,370	-,244	-,215	-,139	,618	,449	,057	,098	,158
Achievement	-,345	-,208	-,273	-,115	-,005	,415	,590	-,053	-,064	,041
Hedonism	-,078	,013	-,113	-,104	-,033	-,091	-,257	,413	,327	-,059
Stimulation	,044	-,023	-,037	-,250	-,395	,026	-,224	,119	,612	,171
Self-Direction	,216	-,191	-,142	-,247	-,378	,095	-,105	,027	,258	,547

Ranks and Rank-order correlations. Table 3 summarizes the ranks, assigned to the ten value types according to mean importance ratings of the CPCV and the PVQ, respectively. The nonparametric correlation between these rank-orders is *Rho* = 0.92.

Table 3 Ranks of the ten value types, corresponding to the CPCV- and PVQi-importance scores.

Ranks	**Value Types**									
Instrument	UN	BE	TR	CO	SE	PO	AC	HE	ST	SD
CPCV	4	2	9	8	3	10	6	5	7	1
PVQi	3	2	10	8	6	9	5	4	7	1

MDS of value type scores. Figures 3 and 4 show the results of separate two-dimensional ordinal MDS of the CPCV- and the PVQ-importance scores. *Stress-I* coefficients of these analyses were 0.11 and 0.09, respectively.

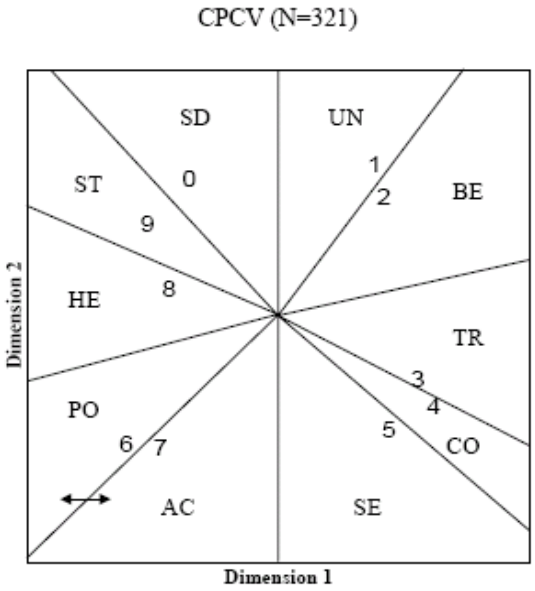

Figure 3 Two-dimensional ordinal MDS of CPCV-scores (N = 321); *Stress-I* = 0.11.

Universalism=UN (1) Benevolence=BE (2) Tradition=TR (3) Conformity=CO (4)
Security=SE (5) Power=PO (6) Achievement=AC (7) Hedonism=HE (8)
Stimulation=ST (9) Self-Direction=SD (0)

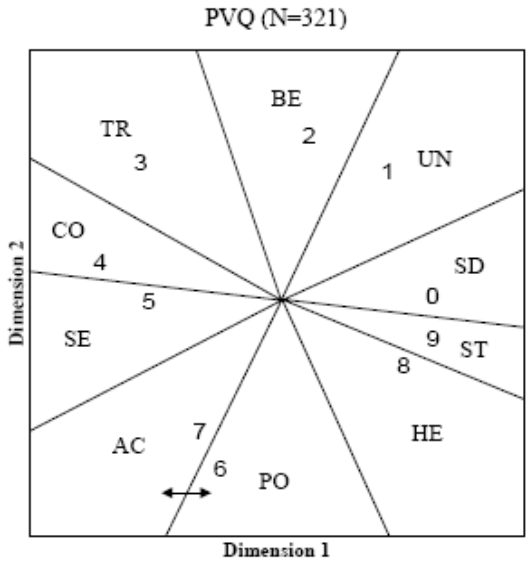

Figure 4 Two-dimensional ordinal MDS of PVQ-scores (N = 321); *Stress-I* = 0.09.

Universalism=UN (1)	Benevolence=BE (2)	Tradition=TR (3)	Conformity=CO (4)
Security=SE (5)	Power=PO (6)	Achievement=AC (7)	Hedonism=HE (8)
Stimulation=ST (9)	Self-Direction=SD (0)		

MTMM-analysis. The results of two MTMM-analyses, including CPCV- and PVQ-scores, and CPCV- and PVQi-scores, respectively, are given in Figures 5 and 6. *Stress-I* was 0.15 for both analyses.

Summary and Discussion

The aim of our study was to construct an instrument which meets a central demand of value assessment, i.e., measuring the importance of single values *relative* to all other values. This was accomplished by applying a paired comparison approach to the ten broad value categories defined by Schwartz' (1992) theory of value structure. Technically, measurement was realized as a standardized online study with a complete and randomized set of graded paired comparisons. This approach was named *Computerized Paired Comparison of Values* (CPCV). Altogether, 312 subjects participated in our validation study. Correlations between the CPCV-data and an online version of the *Portrait Values Questionnaire* (PVQ) corroborate the validity of our approach. Furthermore, structural analyses of the CPCV-data by MDS, both alone and together with the PVQ-data in one joint MTMM-analysis, give additional support to this interpretation.

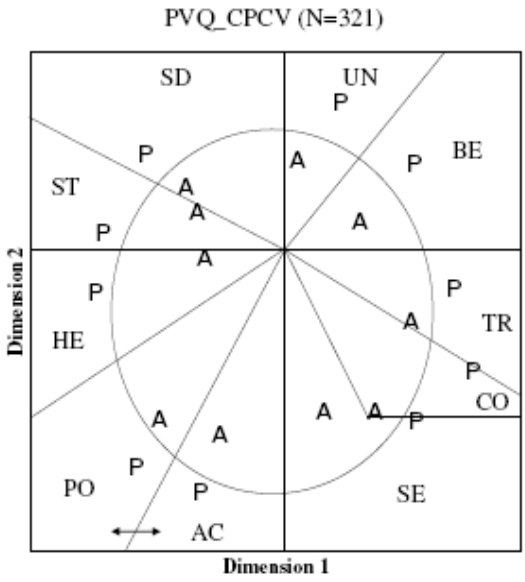

Figure 5 Two-dimensional ordinal MDS of an MTMM-matrix, including CPCV- und PVQ-scores (N = 321); *Stress-I* = 0.15.

Universalism=UN	Benevolence=BE	Tradition=TR	Conformity=CO
Security=SE	Power=PO	Achievement=AC	Hedonism=HE
Stimulation=ST	Self-Direction=SD		

PVQ=A (absolute) CPCV=P

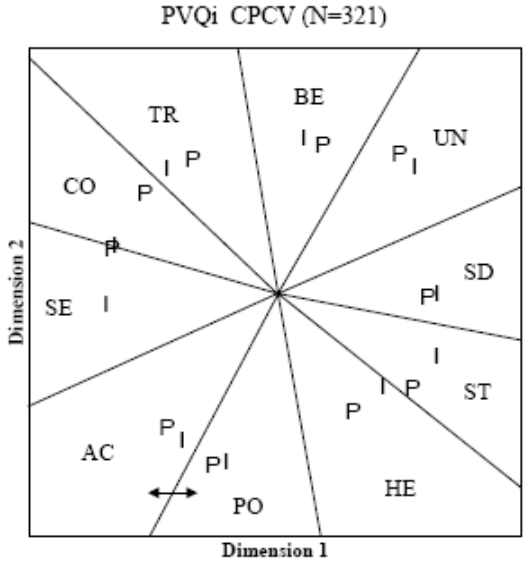

Figure 6 Two-dimensional ordinal MDS of an MTMM-matrix, including CPCV- und PVQi-scores (N = 321); *Stress-I* = 0.15.

Universalism=UN	Benevolence=BE	Tradition=TR	Conformity=CO
Security=SE	Power=PO	Achievement=AC	Hedonism=HE
Stimulation=ST	Self-Direction=SD		

PVQi=I (ipsatized) CPCV=P

As to our present experience with this measurement technique, the CPCV is an efficient and economical tool for assessing values: First, incoming data are collected and aggregated automatically, thus saving considerable time for data analysis and interpretation. Second, the additional registration of response time facilitates the identification of a disproportionately short processing time, which is a reasonable indicator for inadequate answers. Third, randomization of items precludes sequence effects that are typical for paper-and-pencil applications. Fourth, value comparisons are not masked by individual response styles. Finally, paired comparisons are cognitively less demanding than rank-ordering or multiple sorting tasks, because complex decision processes are split into simple alternative decisions.

Of course, these interpretations are still preliminary. Further studies are needed with samples that are representative with respect to gender, age, and educational background. Furthermore, the predictive validity of CPCV-scores needs additional attention and research. However, the present results are promising and stimulating, and thus motivating to proceed with this line of research.

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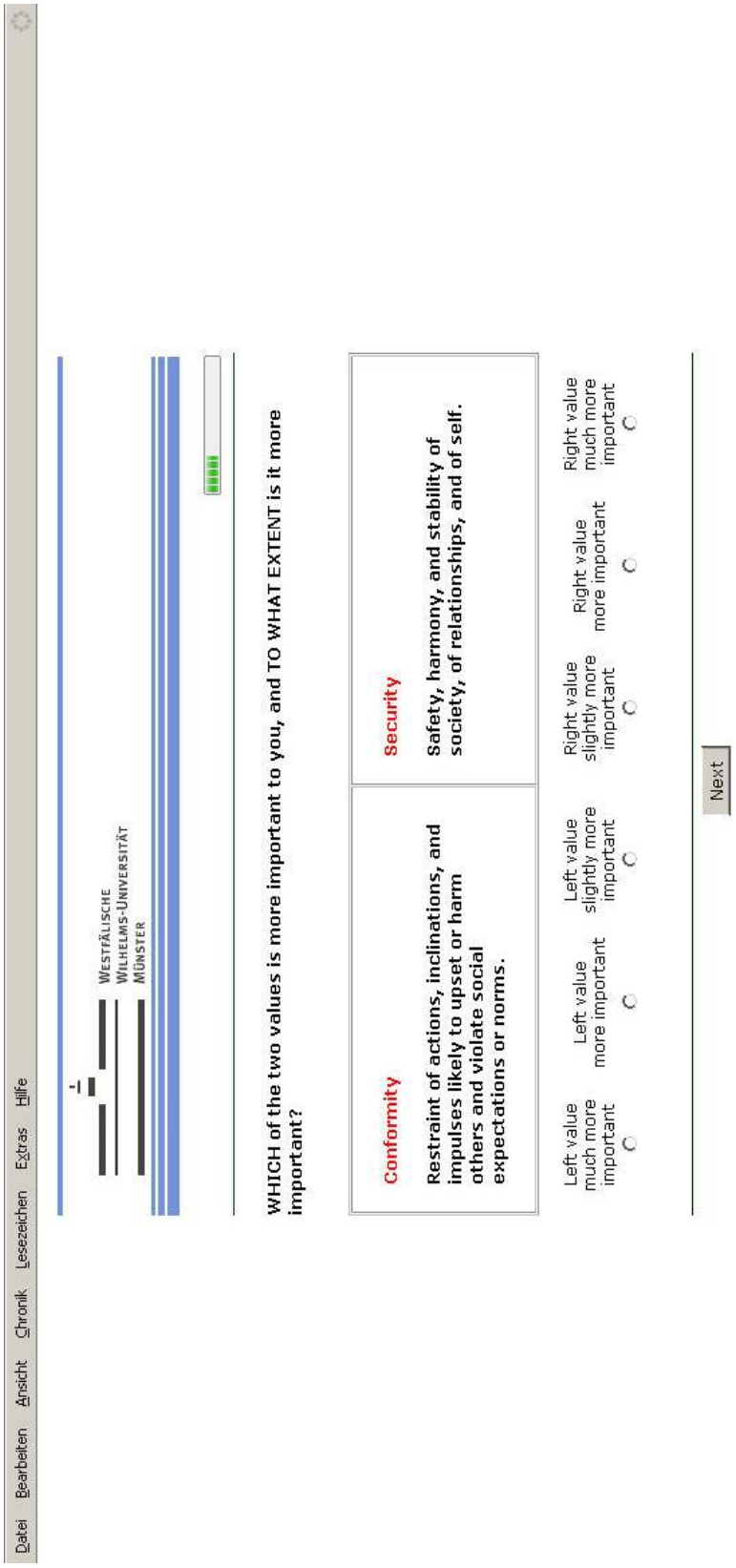
Appendix

Figure A1 Screen-shot from the main study: Instruction of CPCV - value types

Figure A2 Screen-shot from the main study: Instruction of CPCV - comparisons

Figure A3 Screen-shot from the main study: paired comparison (example)



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