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Testing the Relative Comprehensiveness of Schwartz's Ten Value Types with Help from Rokeach

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Abstract: The universality of Schwartz's Theory of Basic Human Values relies on the comprehensiveness of his value types, i.e., they are exhaustive of all human values, no matter where they are found. Schwartz built on Rokeach's (1973) theory of human values, however, by 1994 Schwartz had developed a theory of values that superseded Rokeach's 36 values with ten value types. Drawing on Rokeach, we tested the comprehensiveness of Schwartz's theory by statistically assessing the extent to which Schwartz's model of ten-value types and their underlying structural dimensions incorporate all of Rokeach's 36 values. We performed factor analyses on data collected from Austria, Nigeria, and South Africa with Rokeach's Values Survey Instrument and Schwartz's 21-item Portrait Values Questionnaire (PVQ-21). Our results show that while Schwartz's theoretical model, measured with the PVQ-21, approaches comprehensiveness, it falls short because it does not statistically accommodate six of Rokeach's values. However, longer questionnaires based on the same core theory, especially the 56-item Schwartz Value Survey (SVS), contain these six Rokeach values. Were we to repeat our experiment using the SVS, or one of the other longer versions of the PVQ, we would likely find that all of Rokeach's values are accommodated in Schwartz's theory.

Keywords: Schwartz's Theory of Basic Human Values, Comprehensiveness, Rokeach, Factor Analysis

Introduction

Schwartz's famous Theory of Basic Human Values is based on extensive empirical research that investigated whether there are universal values and what those values are. Schwartz (1994) identifies ten distinct motivational value orientations, which serve as guiding principles in people's lives and other social entities. In Schwartz's theory, which is structured as a two-dimensional model, the ten value types are clustered into four value domains (the details are discussed below). To establish the universality of the Theory of Basic Human Values, Schwartz (1994) needed, inter alia, to demonstrate that the theory had two critically important features, namely: That the ten value types are (i.) generalizable and (ii.) comprehensive. The latter is the topic of this study.

In the context of this research on values, generalizability means that the ten values appear in all cultures across the globe and the meanings of these different values are sufficiently replicated across geographies and cultures (Schwartz and Bilsky, 1987, p. 560). Comprehensiveness in this discussion means that the ten value types are 'exhaustive of all the main types of values recognized in different cultures.' (Schwartz, 1994, p. 22). Schwartz (1994, p. 23) says: 'If this set is comprehensive, there should be no evidence for additional types in cross-cultural studies.

Schwartz (1994, p. 22) proceeded to empirically test whether this set of ten-value types is 'exhaustive of all the main types recognized in different cultures. He reported that after testing his Theory of Basic Values in 97 samples including almost 26,000 respondents from 44 different countries: 'This question cannot be answered definitively …It is possible [however] to classify virtually all the items found in the lists of

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specific values from different cultures … into one of these ten motivational types of values (Schwartz, 1994, p. 22).

In this study, we return to the discussion and the testing of the exhaustiveness or comprehensiveness of the ten value types with the help of Rokeach, whose work laid the foundation for Schwartz's theory.

Schwartz (1992) initially drew heavily on Rokeach's early theorizing about human values and his lists of individual values (instrumental and terminal values to use Rokeach's classification). However, by 1994 he had developed a theory of the content and structure of values that was a 'whole system of values, which superseded Rokeach's 36 values with ten value types (Schwartz, 1994, p. 21). It is this very research trajectory that presents us with another way of testing the comprehensiveness of Schwartz's ten value types.

A new way to test that Schwartz's ten value types are exhaustive and supersede Rokeach's values is to show empirically that Rokeach's values are accommodated within Schwartz's model of 10 types of values and four value domains. We, therefore, we're interested in the extent to which Schwartz's model of ten-value types and their underlying structural dimensions empirically incorporate all of Rokeach's values to statistically test and confirm the comprehensiveness of Schwartz's ten values. We tested the following hypothesis:

If Schwartz's ten value types are more comprehensive than Rokeach's values, then

i. All of Rokeach's 36 values will be accommodated within Schwartz's model of ten basic human values and their underlying dimensions and
ii. There will be at least one of Schwartz's value types that are not covered by any of Rokeach's values

Our hypothesis shows that we were only interested in testing the comprehensiveness of Schwartz's value types relative to Rokeach's values. We proceeded to use empirical data collected with Rokeach's Values Survey Instrument and Schwartz's Portrait Values Indicator from three different countries: Austria, Nigeria, and South Africa. We analyzed the data using explorative factor analysis.

This paper unfolds as follows: We briefly introduce Rokeach's and Schwartz's theories of human values and their survey instruments, followed by a description of our sample and the statistical methods of data analysis; then we present our findings and a discussion of key results.

We start with an overview of Rokeach's conceptualization of human values and his values Survey instrument before discussing Schwartz's Theory of Human Values and his Portrait Values Indicator.

Theoretical Background

Rokeach's Conceptualization of Human Values and his Value Survey

The study of human values has a long history in the social sciences. Over a century ago, in 1908, Hugo Münsterberg published the first psychological model of human values (Hanel *et al*., 2018). The sociologist Talcott Parsons referred to the scientific study of values in his book 'The Structure of Social Action', which was published in 1937, and in the 1950 s, Clyde Kluckhohn established the study of human values in anthropology (Torres *et al*., 2006, p. 341). In the 1960 s the famous psychologist Gordon Allport and his colleagues, Vernon and Lindzey, created the Allport-Vernon-Lindzey Study of Values (Hanel *et al*., 2018). Their study included the design of a values scale which measured six major value types, namely: theoretical (discovery of truth), economic (what is most useful), aesthetic (form, beauty, and harmony), social (seeking the love of people), political (power) and religious (unity). Milton Rokeach's (1973) criticism of Allport, Vernon, and Lindzey's work on values and their measurement led to his empirical research and his substantial conceptual development of human values.

Rokeach (1973, p. 5) defined the concept of values as 'an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence. He argued that the concept of human values is distinguishable from attitudes, social norms, traits, interests, and needs Rokeach (1973, p. 3). He based his theory of human values on five assumptions (Rokeach, 1973 pp. 5-6): (1). Every person possesses a relatively small number of values; (2). Human beings possess the same basic values to different degrees (although how they prioritize them can differ); (3). Values can be organized into a value system, which is 'an enduring organization of beliefs concerning preferable modes of conduct or end-states of existence along a continuum of relative importance' (Rokeach, 1973, p. 5) and if individual or group values change, they tend to change slowly over time; (4). Human values are influenced by and traceable to culture, society, institutions, and personality; and (5). The consequences of human value priorities are evident in all social phenomena (Rokeach, 1973, pp. 5-6). Rokeach explored the relationship between values and human behavior and how values can predict individual and group behavior. 'Values are guides and determinants of social attitudes and ideologies on the one hand and of social behavior on the other' Rokeach (1973, p. 24).

Rokeach's empirical research led him to conclude

that human value systems can be divided into two fundamental categories, namely terminal values and instrumental values. Terminal values are end states of existence (goals) or modes of living such as freedom or happiness, which have been idealized and are worth striving for (Rokeach, 1973). Terminal value systems reflect the prioritization of these goals that individuals or groups would like to achieve. Instrumental values are desirable social behaviors, such as politeness or courage. The instrumental value systems represent the prioritization of desirable behaviors by individuals or groups. Instrumental and terminal values are functionally linked in that all values are instrumental to attaining end-states. However, Rokeach (1973) argues that these two sets of values do not have a one-to-one connection between them.

In his attempt to measure values empirically he designed the Rokeach Value Survey (RSV), which is a 36-item questionnaire divided into 18 instrumental values and 18 terminal values (see Appendix). In the survey respondents are asked to rank the 18 terminal values and then the 18 instrumental values, in an order 'of importance to you, as guiding principles in your life' (Rokeach, 1973, p. 27). Table 1 provides the lists of these two sets of values. RSV has been used in the measurement of values in individuals and groups as well as societies.

Rokeach (1973) wanted an instrument that was universally applicable or generalizable. He said: 'If all men (sic) everywhere possess them, comparative cross-cultural investigations of values would then become considerably easier' Rokeach (1973, p. 4).

Unlike other values researchers, such as Schwartz (see his two-dimensional values model below) and Inglehart (with his materialism-postmaterialism scale), Rokeach's theory of values does not include an underlying dimensional structure.

In our study, we treated Rokeach's terminal and instrumental values and their corresponding sections in the Rokeach Value Survey separately because Rokeach presents them as two distinct sets of values, which can be measured independently. Some studies (e.g., Sherrid, 1979; Wright, 1991 and Glaz, 2012) have used either Rokeach's Terminal Value Survey or the Instrumental version, thereby confirming that they are often treated as separate instruments.

Schwartz's Theory of Basic Values and his Portrait Values Indicator

Schwartz (1992 and 1994) drew on Rokeach's theory of human values and in time developed a new theory of basic values that inter alia addresses some of the shortcomings he saw in Rokeach's work. For example, Rokeach did not sufficiently theorize about the relationship between values and this is a key feature of Schwartz's theory.

In his Theory of Basic Values, Schwartz (2012) defines values as beliefs and desirable goals, which serve as guiding principles in people's lives and other social entities. He identifies ten distinct motivational value orientations and shows how they relate to each other-some are compatible and some are in conflict. The 'structure' of these values reflects relations of divergence and congruence among values and not their relative importance (Schwartz, 2009).

Table 2 summarizes the ten value types, their definitions, and examples of exemplary values. For a more detailed discussion see Schwartz (2009).

Schwartz (2009) argues that these value types are universal (i.e., generalizable and comprehensive), but individuals and groups differ in the relative importance they attribute to these value priorities.

Schwartz's theory clusters the ten value types into four value domains as follows:

- Self-direction, Stimulation, and Hedonism share the same motivational goal which is Openness to Change
- Benevolence and Universalism are motivated by Self-transcendence
- Conformity, Tradition, and Security are motivated by Conservation
- Power, Achievement, and Hedonism are motivated by Self-enhancement

Hedonism includes aspects of both Openness to Change and Self-enhancement, hence its position in Fig. 1 on the borderline that separates these two domains (Schwartz, 2009).

In Fig. 1 the diagram shows how Schwartz organizes the structure of his theory as a two- dimensional model, which includes the ten values and the four value domains. The relations between Schwartz's value types are best represented as a circle divided into sectors, which reveals a pattern of compatibilities and conflicts. For example, values such as Achievement and Power are usually compatible, however, the pursuit of Achievement values tends to conflict with the pursuit of Benevolence (Schwartz, 2009). In the circular diagram, Schwartz emphasizes how the values represent a motivational continuum: 'The closer any two values in either direction around the circle, the more similar their underlying motivations; the more distant, the more antagonistic their motivations' (Schwartz, 2009).

Schwartz has developed different instruments based on his theory to measure human value types and the ways people think about values.

Table 1: Rokeach's 18 terminal and 18 instrumental values

Terminal values	Instrumental values
1. True friendship	1. Cheerfulness
2. Mature love	2. Ambition
3. Self-respect	3. Love
4. Happiness	4. Cleanliness
5. Inner harmony	5. Self-control
6. Equality	6. Capability
7. Freedom	7. Courage
8. Pleasure	8. Politeness
9. Social recognition	9. Honesty
10. Wisdom	10. Imagination
11. Salvation	11. Independence
12. Family security	12. Intellect
13. National security	13. Broad-mindedness
14. A sense of accomplishment	14. Logic
15. A world of beauty	15. Obedience
16. A world at peace	16. Helpfulness
17. A comfortable life	17. Responsibility
18. An exciting life	18. Forgiveness

Source: Rokeach (1973, p. 359, 361)

Table 2: Schwartz's motivational values

Value Type	Definition	Exemplary values
Power	Social status and prestige, control or dominance over people and resources	Social power, authority, wealth
Achievement	Personal success through demonstrating competence according to social standards	Success, ability, ambition
Hedonism	Pleasure and personal gratification	Pleasure, fun, fulfillment
Stimulation	Excitement, novelty, and challenge in life	Excitement, variety
Self-direction	Independent of thought and action, creating, exploring	Creativity, curiosity, freedom
Universalism	Understanding, appreciation, tolerance, and protection for all people and nature	Social justice, equality, awareness
Benevolence	Preservation and enhancement of the welfare of people with whom one has frequent personal contact	Kindness, support, honesty, forgiveness
Tradition	Respect, commitment towards and acceptance of the customs and ideas that culture or religion provide	Deference, devotion, tolerance
Conformity	Restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms	Courtesy, obedience, honor
Security	Safety, harmony, and stability of society, of relationships and self	Social order, organization

Source: Schwartz (1992)

His first instrument was the 56-item Schwartz Value Survey, followed by various versions of the Portrait Values Questionnaire (PVQ), namely the 40-item PVQ (or PVQ-40), the 21-item PVQ-21, and the 56-item PVQ5X, which was replaced by the revised PVQ (or PVQ-R) and most recently the PVQ-RR (Schwartz and Cieciuch, 2021)[1]. The PVQ5X, PVQ-R, and the PVQ-RR are based on a refined version of Schwartz's theory, which retains the four higher-order value domains mentioned above, but extends the measurement of 10 value types to 19.

The PVQ-21 has been widely used in studies across the globe. It is included in the biennial European Social Survey and is likely to be used in future similar studies. Therefore, we also chose to use the PVQ-21 and its underlying circular model with ten value types that were described above. There are female and male versions of the questionnaire. The PVQ contains 21 items or portraits. Each item describes a particular goal, aspiration, or wish which refers to a single underlying value (Schwartz, 2009). For example, the first item in the female version of the questionnaire contains the following two statements: 'Thinking up new ideas and being creative is important to her. She likes to do things in her own original way' (see Appendix). These two statements describe a person who values self-direction. The first statement describes the importance of a valued goal to the person. The second statement describes the person's feelings about the goal. Each respondent is asked the extent to which she is like the person described in a portrait by ticking the number that best represents her position on a Likert scale of 1-6 (where 1 is 'Very much like me' and 6 is 'not like me at all).

[1]These revised and longer versions of the PVQ are based on Schwartz's refined theoretical model of basic values (Schwartz and Cieciuch 2021). In the refined version the circular structure of the model is retained and the ten basic values are replaced with 19 more narrowly defined values, including two new values 'Face' and 'Humility'. We return to this modification in the final discussion

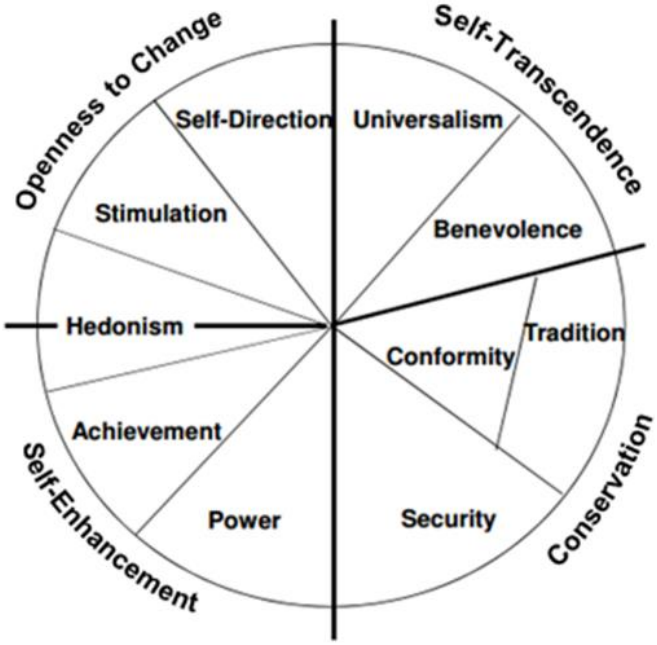

Fig. 1: Schwartz's two-dimensional model of motivational value types and higher-order value domains Source: Schwartz (2012, p. 9) (Schwartz has permitted us to reproduce this diagram)

Methodology

Sample

We collected survey data from first-year and third-year bachelor's students in the social sciences at three universities, namely Johannes Kepler University (JKU) in Austria, Godfrey Okoye University (GOU) in Nigeria, and the University of Cape Town (UCT) in South Africa. A total of 453 respondents completed the survey. Selected demographic details are included in Table 3. Among the respondents:

- 29.4% were from JKU, 34.4% were from GOU and 36.2% were from UCT
- 62.7% were first-year students and 37.3% were third-year students
- 68.4% were female and 31.6% were male[2]
- 63.0% had grown up in urban areas and 37.0% in rural areas

The average student age was 21.5 years old. Additional descriptive statistics are included in Table 3. These statistics demonstrate that the sample of undergraduate students was a good mix across a range of demographic variables.

Data Collection Methods

The individual value orientations of the students in our sample were measured using the Rokeach Value Survey (RVS) Questionnaire (Rokeach, 1973) and Schwartz's Portrait Value Questionnaire (PVQ-21) (Schwartz, 2009). To compare the results from both questionnaires, we revised the response categories for all of the items in the RVS so that they conform to the six-point Likert Scale used in the PVQ-21. This approach is also more suitable for analyzing the underlying dimensional structure using factor analysis (Thompson *et al*., 1982). The female version of the PVQ-21 and the gender-neutral RVs are included in the Appendix.

We did not include Rokeach's item 'Salvation' in the version of the RVS we used because some respondents, who do not have Protestant Christian backgrounds, may struggle to relate to the concept or interpret its inclusion in the questionnaire as an attempt to assert a particular worldview. We wanted to avoid response bias caused by what is known as the 'halo effect' (Neuman, 2014, p. 4) or the 'social desirability bias, which could undermine the validity of the study (Neuman, 2014, p. 330).

[2]The ratio of 1 male: 2 Females is expected given the global tendency for substantially more females than males to register in the social sciences

Table 3: Sample composition

Variable	Categories	n	%	Mean (SD)
University	JKU (Austria)	133	29.4	
	GOU (Nigeria)	156	34.4	
	UCT (South Africa)	164	36.2	
Total		453	100.0	
Academic Level	First year Students	284	62.7	
	Third year Students	169	37.3	
Total		453	100.0	
Gender	Female	142	31.6	
	Male	307	68.4	
Total		449	100.0	
Home: Urban/rural	Urban	274	63.0	
	Rural	161	37.0	
Total		435	100.0	
1st language	German	113	25.5	
	English	108	24.3	
	Igbo	109	24.5	
	isiXhosa, isiZulu, isiNdebele, siSwati	390	8.8	
	Other African languages (e.g.,) Afrikaans, boki, fang, hausa)	500	11.3	
	Other languages (e.g.,) serbo-croatian, Mandarin, persian)	250	5.7	
Total		444	100.0	
Age		428		21.5 (6.302)

Source: The authors

Methods of Analysis

To test our research hypothesis about the comprehensiveness of Schwartz's ten values concerning Rokeach's 36 values, we applied factor analysis. Factor analysis helped us to assess whether Schwartz's theory of values, measured by the PVQ-21, is more comprehensive than Rokeach's values, measured by the RVs. We illustrate in Fig. 2 the logic of our factor analysis by referring to two measurement instruments. However, the same logic can be easily extended to three or more measurement instruments. In Fig. 2 we label the two measurement instruments simply as A and B. The logic of the procedure is governed by our objective, which is to assess which instrument is more comprehensive or exhaustive.

In Fig. 2 measurement instrument A contains three factors A 1, A 2, and A 3, and measurement instrument B also has three factors B 1, B 2, and B 3. Ordinarily, these factors would have been measured by manifest variables that are not depicted in the four graphical displays. The data generated by the two measurement instruments would then be re-analyzed with the second round of factor analysis that may result in the four possible meta-factor models3, which are presented in Fig. 2. In these models, M1, M2, etc., represent higher levels of factor construction or meta-factors.

If we assume measurement instrument A is Schwartz's Ten Value Types, then Fig. (2a) represents our Hypothesis 1 (Schwartz's ten value types are comprehensive). Figures (2b), (2c), and (2d) represent possible results if Hypothesis 2 (Schwartz's ten value types are not comprehensive) is correct.

Figure 2 shows all the possible logical results:

- Figure 2a, measurement instrument A is more comprehensive because it contains a factor A 3 that represents an additional single meta-factor that is not derived from instrument B. Instrument A can construct meta-factor model M that consists of three meta-factors M 1, M 2, and M 3

[3]We use the term 'meta-factor model' in this study rather than 'second-order factor model' because we analyzed first-order factor models for different measurement instruments. The term 'second-order factor model' or 'higher-order factor model' is usually reserved for an analysis that tries to find underlying factors within one first-order factor solution (Thompson, 1990; Wolff and Preising, 2005)

- In Fig. 2b, the opposite is true because instrument B contains one factor B3 that constitutes an additional single meta-factor that is not derived from instrument A
- In Fig. 2c, none of the two instruments is comprehensive. Each instrument contributes to an additional single meta-factor. However, if we combine the two instruments, we get a more comprehensive measurement instrument that contributes to all the meta-factors M 1 = {A 1, B 1}, M 2 = {A 2, B 2}, M 3 = {B 3} and M 4 = {A 3}

In Fig. 2d, both instruments are equally comprehensive. Each instrument can construct a general value model that consists of three common factors.

To find out which of the possible meta-factor models fits the outcome of our comparative assessment of the extent to which Schwartz's ten values are more comprehensive, we applied Explorative Factor Analysis (EFA). We opted for EFA because the application of the more widely used Confirmatory Factor Analysis was not possible. For Schwartz's PVQ, Confirmatory Factor Analysis could have been applied (Schwartz and Boehnke, 2004; Lilleoja and Saris, 2014; Knoppen and Saris, 2009) because a clear theory with a two-dimensional value space exists. However, as we noted earlier, a theory about the dimensional structure of Rokeach's values has not been developed. Furthermore, several authors (e.g., Gibbins and Walker, 1993; Debats and Bartelds, 1996; Bocsi, 2012) have analyzed Rokeach's measurement instruments with EFA using varimax rotation. We have followed their lead and used EFA.

We used a Two-Step Approach in our EFA

Step 1: We started by analyzing each measurement instrument (Schwartz's PVQ21, Rokeach's terminal values, Rokeach's instrumental values) separately using EFA (see Rummel 1970). The number of factors was determined using Kaiser's eigenvalue criterion ('eigenvalue >1') and the scree plot. Rummel (1970, pp. 362-365) notes that all factors (or components) with an eigenvalue of at least 1.00 should be considered common factors. Because the eigenvalue >1 criterion should not be applied automatically, we additionally computed a scree plot, which helped us either confirm or revise our initial decision on the final number of factors in the factor analysis. According to Catell (cited in Rummel, 1970, pp. 364-365), the number of factors is fixed at the point where the scree plot reveals an elbow (or discontinuity). Where this occurs, the number of common factors is equal to 'elbow minus 1'. Where the two criteria resulted in different solutions, we gave preference to the elbow criterion. To obtain a meaningful interpretation of the common factors, varimax rotation with Kaiser normalization was applied. The assignment of an item to a factor was based on the rotated component matrix. Some items loaded on more than one factor and, while they contributed to the factor, they were less influential. Only those items that loaded on one factor were taken into account as influential when naming the respective factors discussed below (Rummel, 1970, pp. 472-479).

The results were easily and meaningfully interpreted and we were able to progress to the next step.

Step 2: In the second and final step, the mean score values for the extracted factors were computed. A further EFA, a meta-factor analysis, was computed for the new factors produced by Step 1. Factors that loaded on two or more meta-factors were less influential and ignored in the naming of the meta-factor, but they were taken into account in the final analysis because they represent the meta-factors on which they load.

Limitations

Our research tested the relative comprehensiveness of Schwartz´s ten value types compared to Rokeach's values. To the best of our knowledge, this has not been attempted before. Vauclair *et al.* (2011) have used Rokeach's Values to evaluate Schwartz, but their study focused on Schwartz's cultural value theory and used aggregate level data. Naturally, our research has limitations. Firstly, our sample only covers three countries, and within these countries only social science students. It, therefore, lacks both global scale and cultural diversity. Consequently, we cannot confidently generalize the results. Secondly, we do not analyze comprehensiveness in an absolute sense. This would require a very different approach. Our test is a relative one and is based on an empirical analysis. The explorative nature of Explorative Factor Analysis, which we used, does not meet-in the strictest sense-the requirements for statistical testing. Nonetheless, our study provides insights into an important aspect of Schwartz´s value theory and describes a way that may guide further research.

We now report our findings. In the next section, we use the term factor to mean the underlying dimension.

Results and Discussion

Schwartz's PVQ-21

The application of EFA to the data generated by Schwartz's PVQ resulted in six factors with an eigenvalue larger than 1.00 (Table 9 in the Appendix). According to Kaiser's criteria, this suggests that statistically there are six underlying common factors or constructs in the data derived from the PVQ. The scree plot in Fig. 3 in the Appendix supports this decision by showing the first elbow at factor seven. Table 4 also reveals that a meaningful interpretation of the results is possible. After completing the EFA, we discovered that the first four (out of the six) factors corresponded well with Schwartz's four value domains.

- The first factor, labeled AA1 in Table 4, represents Schwartz's value-domain 'Conservation' and

contains the two Tradition items (TR 1 and TR 2)[4], the two Security items (SE 1 and SE 2) and the two Conformity items (CO 1 and CO_2). The two Conformity items load on two factors, namely factor 1 (AA 1) and factor 2 (AA 2). Consequently, they are ignored in the naming of the factor.

- The second factor AA 2 corresponds with Schwartz's higher-order value-domain 'Self-Enhancement' and consists of the two Power items (PO 1 and PO 2) and the two Achievement items (AC 1 and AC 2). As already mentioned, the two Conformity items (CO 1 and CO_2) also load on this factor, so they are ignored in the naming of this factor
- The third factor AA 3 represents Schwartz's value-domain 'Self-Transcendence'. It includes the two Benevolence items (BE 1 and BE 2) and two of the three Universalism items (UN 2 and UN 3). Item UN1 is assigned to another factor (see AA6 below)
- The fourth factor AA 4 corresponds with Schwartz's value domain 'Openness to Change'. It contains the two Stimulation items (ST 1 and ST 2) and one Self-direction item (SD 1)
- The fifth factor AA5 contains the two Hedonism items (HE 1 and HE 2), which in Schwartz's model (1992) fall between the value domains 'Self-Enhancement' and 'Openness to Change'
- The sixth and final factor, AA6 contains one Self-direction item (SD 2) and one Universal Item (UN 1). It could be labeled 'freedom and equality

EFA of the data collected using the PVQ-21 generated six substantive factors, which we could easily interpret. The first four factors match the value domains found in Schwartz's two-dimensional value model. While last two factors do not fit into any of Schwartz's domains. These results may be a consequence of our specific sample of students.

Rokeach's Terminal Values

An EFA of Rokeach's Terminal Values resulted in five factors with an eigenvalue larger than 1.00. The sixth eigenvalue in the pre-rotation solution (Table 10 in the Appendix), which was used to determine the number of factors, was 0.960 and very close to 1.00. It is quite possible that had we drawn another random sample, the eigenvalue would have been greater than 1.00. We, therefore, also applied the elbow criteria, which we found to support six common factors (see the scree plot in Fig. 4 in the Appendix). With further analysis, we discovered that the six factors lend themselves to meaningful interpretation. The results presented in Table 5 are summarized and interpreted as follows:

- The first factor BB1 includes four of Rokeach's items: Rok-T1 5 (Social Recognition), Rok-T1 (Comfortable Life), Rok-T 2 (Exciting Life), and Rok-T 3 (Accomplishment). However, Rok-T1, Rok-T 2, and Rok-T 3 also load on other factors and, therefore, we associate factor-BB 1 exclusively with Rok-T15 'Social Recognition'
- The second factor BB2 includes three of Rokeach's items: Rok-T4 (World Peace), Rok-T5 (World Beauty), and Rok-T6 (Equality) and represents 'Social Expectations'
- The third factor-BB 3 includes Rokeach's items Rok-T1 4 (Self-respect) and Rok-T17 (Wisdom) and represents 'Individual Maturity'. Rok-T 10 and Rok-T3 load on other factors
- The fourth factor-BB 4 includes Rokeach's two Security-items (Rok-T1 2 and Rok-T 7) and represents 'Security'. Rok-T1 loads on another factor
- The fifth factor BB5 includes Rokeach's two items Rok-T13 (Pleasure) and Rok-T 8 (Freedom) and represents 'Choice'. Rok-T 2 loads on another factor
- The sixth and last factor-BB 6 includes Rok-T11 (Love), Rok-T9 (Happiness), and Rok-T16 (Friendship) and represents 'Connectedness'. Rok-T 10 loads on another factor

Explorative Factor Analysis of the data collected using Rokeach's Terminal Values generated six substantive factors, which we easily and meaningfully interpreted as Social Recognition, Social Expectations, Individual Maturity, Security, Choice, and Connectivity.

Rokeach's Instrumental Values

An EFA of Rokeach's Instrumental Values results in three factors with an eigenvalue larger than 1.00 (see Table 11 in the Appendix). The scree plot (Fig. 5 in the Appendix) shows an elbow at four factors and confirms three factors as the result.

The three factors describe desirable behaviors and are meaningfully interpreted (Table 6) as follows:

- The first factor CC 1 includes nine of Rokeach's instrumental items: Rok-I18 (Self-controlled); Rok-I13 (Logical); Rok-I1 (Ambitious); Rok-I17 (Responsible); Rok-I5 (Clean) and Rok-I12 (Intellectual). Three of Rokeach's instrumental items: Rok-I1 5; Rok-I 3 and Rok-I16, load on two other factors and are ignored. Factor CC1 represents 'Victorian/Germanic Rational Behavior'
- The second factor CC 2 includes five of Rokeach's items: Rok-I8 (Helpful); Rok-I7 (Forgiving); Rok-I9

[4]Each of the items in Schwartz's PVQ-21 is provided in the Appendix

(Honest); Rok-I4 (Cheerful) and Rok-I14 (Loving). Rok-I15 and Rok-I16 load on two other factors. CC2 represents 'Sociable Behavior'

- The third and last factor CC3 includes Rokeach's items Rok-I2 (Broadminded); Rok-I11 (Independent); Rok-I10 (Imaginative) and Rok-I6 (Courageous). Rok-I3 loads on another factor. CC3 represents 'Visionary Behavior'

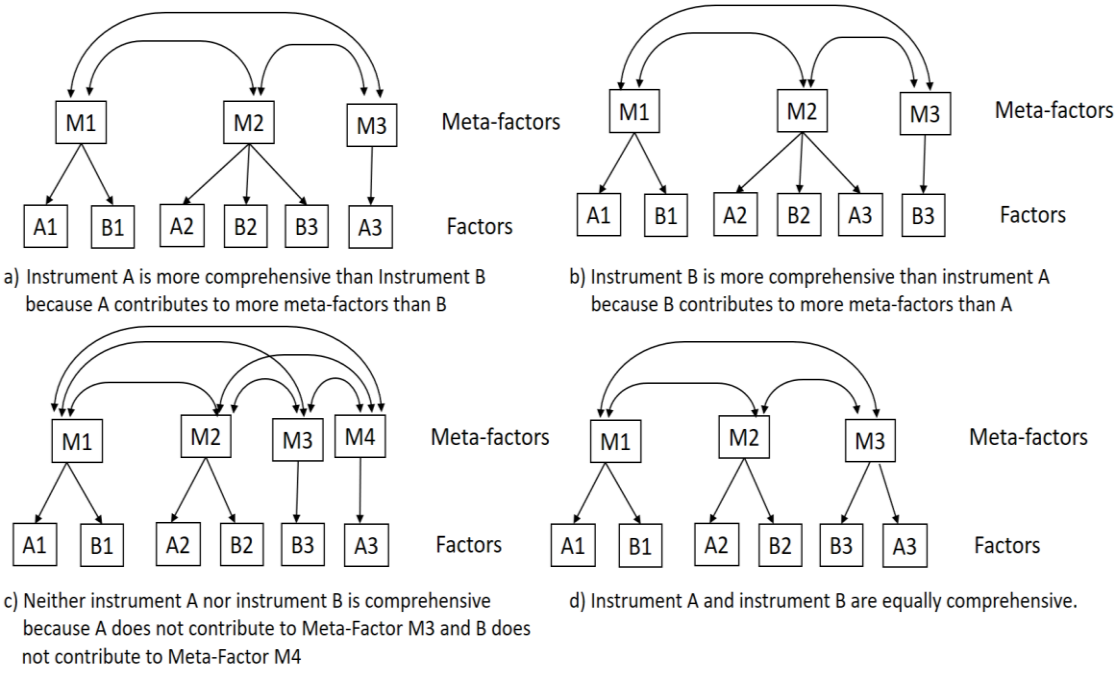

Fig. 2: Various meta-factor models for two measurement instruments A and B Source: The authors.

Table 4: Rotated factor matrix for Schwartz's PVQ

	Factors					
Items	AA1 Conservation	AA2 Self-enhancement	AA3 Self-transcendence	AA4 Openness to change	AA5 Hedonism	AA6 Freedom and equality
TR1 tradition 1	0.754					
SE2 security 2	0.639					
SE1 security 1	0.610					
CO1 conformity 1	0.594	0.430				
TR2 tradition 2	0.555					
PO2 power 2		0.772				
AC1 achievement 1		0.738				
AC2 achievement 2		0.587				
CO2 conformity 2	0.480	0.583				
PO1 power 1		0.458				
BE2 benevolence 2			0.653			
UN3 universalism 3			0.649			
UN2 universalism 2			0.613			
BE1 benevolence 1			0.511			
ST1 stimulation 1				0.722		
ST2 stimulation 2				0.712		
SD1 self-direction 1				0.584		
HE1 hedonism 1					0.780	
HE2 hedonism 2					0.704	
SD2 Self-direction 2						0.645
UN1 universalism 1			0.438			0.586
Eigenvalue after rotation	2.655	2.559	2.037	2.000	1.610	1.533
Explained variance in % for the final rotated factors	12.6%	12.2 %	9.7%	9.5%	7.7%	7.3%

Source: The authors
Notes: n = 426; Explorative factor Analysis uses the principal component method with varimax rotation and Kaiser's normalization

Table 5: Rotated component matrix for rokeach's terminal values

	Factors					
Items	BB1 social recognition	BB2 social expectations	BB3 individual Maturity	BB 4 security	BB 5 choice	BB 6 connectedness
Rok-T15 social recognition	0.703					
Rok-T1 comfortable life	0.668			0.432		
Rok-T2 exciting life	0.606				0.412	
Rok-T4 world at peace		0.748				
Rok-T5 world of beauty		0.721				
Rok-T6 equality		0.718				
Rok-T14 self-respect			0.700			
Rok-T17 wisdom			0.692			
Rok-T10 inner harmony			0.631			0.461
Rok-T3 accomplishment	0.451		0.471			
Rok-T12 national security				0.834		
Rok-T7 family security				0.552		
Rok-T13 pleasure					0.717	
Rok-T8 freedom					0.710	
Rok-T11 mature love						0.819
Rok-T9 happiness						0.469
Rok-T16 true friendship						0.428
Eigenvalues after rotation	1.969	1.931	1.863	1.718	1.686	1.629
Explained variance for final rotated factors	11.6%	11.4%	11.0%	10.1%	9.9%	9.6%

Table 6: Rotated component matrix for Rokeach's instrumental values

	Factors		
Items	CC1 victorian/germanic rational behavior	CC_2 Sociable behavior	CC_3 visionary Behavior
Rok-I18 self-controlled	0.789		
Rok-I15 obedient	0.694	0.460	
Rok-I13 logical	0.661		
Rok-I1 ambitious	0.651		
Rok-I17 responsible	0.623		
Rok-I5 clean	0.610		
Rok-I3 capable	0.605		0.441
Rok-I16 polite	0.575	0.529	
Rok-I12 intellectual	0.568		
Rok-I8 helpful		0.795	
Rok-I7 forgiving		0.760	
Rok-I9 honest		0.579	
Rok-I4 cheerful		0.575	
Rok-I14 loving		0.574	
Rok-I2 broadminded			0.736
Rok-I11 independent			0.622
Rok-I10 imaginative			0.608
Rok-I6 courageous			0.466
Eigenvalue after rotation	4.213	3.129	2.307
Explained variance for final rotated factors	23.4%	17.4%	12.8%

Table 7: Rotated component matrix for meta-factors

	Meta-factors				
First Order factors	MM 1 individuation	MM 2 safeguarding the world	MM 3 solidarity	MM 4 modern social democracy	MM 5 humanness
CC3 visionary behavior (rokeach)	0,756				
BB3 individual maturity (rokeach)	0,749				
CC1 self controlled (rokeach)	0,706	0,516			
BB1 social recognition (rokeach)	0,576	0,420			
AA1 conservation (schwartz)		0,831			
BB4 security (rokeach)		0,631			
AA2 self-enhancement (schwartz)		0,559		0,403	
BB2 social expectation (rokeach)			0,752		
CC2 sociable behavior (rokeach)			0,668		
AA3 self-transcendence (schwartz)			0,612	0,574	
AA6 freedom/equality (schwartz)				0,684	
AA4 openness to change (schwartz)				0,673	
AA5 hedonism (schwartz)				0,549	0,505
BB5 choice (rokeach)					0,782
BB6 connectedness (rokeach)					0,692
Eigenvalues	2.704	2.015	1.851	1.841	1.658
Explained variance	18.0%	13.4%	12.3%	12.3%	11.1%

Table 8: Schwartz's questionnaires (SVS, PVQ40 and PVQ5X/PVQ-RR) that include Rokeach's six values

Rokeach's 6 Values	SVS closest values and Items (Schwartz, 1992)	PVQ40 Closest values and Items (Saris, Knoppen and Schwartz, 2013)	PVQ5X (or PVQ-RR) Closest Values and Items (Schwartz *et al*., 2012)
Self-respect	Self-respect. Item 14: (belief in one's own worth)	Self-direction Item 34. (rely on her/himself)	Self-direction: Action. Items 18, 33 (rely on self; not an external assessment of performance)
Wisdom	Wisdom. Item 26: (a mature understanding of life)	Self-direction Item 22 (understanding all sorts of things); Universalism Item 23 (live in harmony…promoting peace)	Universalism-Tolerance: Items 14, 57 (wisdom; understanding)
Broadminded	Broadminded. Item 35: (tolerant of different ideas and beliefs)	Universalism. Item 8. (listen to people … different from him/her)	Universalism - Tolerance Items 14, 36, 57 (broadminded)
Independent	Independent. Item 31 (self-reliant, self-sufficient)	Self-direction. Item 11 (own decisions); Item 34 (independent)	Self-direction-Action. Items 18, 33 (independent, self-reliant)
Imaginative	Creativity. Item 16 (uniqueness, imagination)	Self-direction. Item 1. (new ideas, creative)	Self-direction-Thought. Items 1, 24 (creativity, imagination)
Courageous	Daring. Item 37 (seeking adventure, risk)	Stimulation. Item 15 (risks, adventure)	Stimulation. Items 26, 41 (Excitement, daring)

An EFA of the data collected using Rokeach's Instrumental Values generated three substantive factors, which we interpreted as Victorian/Germanic Rational Behavior, Sociable Behavior, and Visionary Behavior.

Meta-Factors

To analyze which of the meta-factor models (Fig. 2) fits the data better, we computed the average sum scores for the identified factors. (The syntax used to compute the average sum scores is available on request.) As before, items that loaded on two or more factors were neglected in the naming of the meta-factors. However, in the final and higher level of analysis, we took into account these factors that loaded on more than one meta-factor although their influence was weaker than the factors that loaded only on one meta-factor.

An EFA resulted in five factors larger than 1.00 (Table 12 in the Appendix). The scree plot in Figure 6 in the Appendix shows an elbow at six factors that indicate five factors. The five-factor solution was further analyzed. The results are shown in Table 7 and summarized below. At this level of analysis, we are primarily interested in the extent to which the meta-factors align with Rokeach or Schwartz's common factor in the earlier rounds of analysis.

- The first meta-factor, MM1, includes factors derived from Rokeach's terminal and instrumental values, namely CC3 Visionary Behavior and BB3 Individual Maturity, which together represent 'Individuation'. Each of the factors CC 1 and BB 1 also loads on another factor and, therefore, they are neglected in the interpretative naming of meta-factor 1 although they are taken into account in the final analysis discussed below. The same applies to factors listed below that load on more than one meta-factor.
- The second meta-factor MM 2 includes factors derived from both Rokeach and Schwartz's values, namely AA 1 Conservation and BB 4 Security, which represents 'Safeguarding the world'. Each of

the factors CC1, BB1, and AA2 also loads on another factor

- The third meta-factor MM3 primarily includes the factors BB2 Social Expectations and CC 2 Sociable Behavior, which are derived from Rokeach's values and represent 'Solidarity'. AA 3, (derived from Schwartz's values) also loads on another factor
- The fourth meta-factor primarily includes the factors AA6 Freedom and Equality, and AA 4 Openness to Change, which are derived from Schwartz's values and represent 'modern social democracy. Each of the factors AA 2, AA 3, and AA 5 also loads on another factor
- The last meta-factor, MM5, primarily includes the factors BB5 Choice and BB6 Connectedness, which are derived from Rokeach's values and represents the essence of 'humanness'. AA5, (derived from Schwartz's values) also loads on another factor

With the main interest of this study in mind, we can summarize the above results as follows:

- Meta-factor MM 1 is based on Rokeach's values
- Meta-factor MM 2 is based on Rokeach and Schwartz's values
- Meta-factor MM 3 is based on Rokeach and Schwartz's values although the latter's influence is weaker
- Meta-factor MM 4 is based on Schwartz's values
- Meta-factor MM 5 is based on Rokeach and Schwartz's values although the latter's influence is weaker

Table 9: Eigenvalues for Schwartz' PVQ

Factor Number	Eigenvalue	% of Variance	Cumulative %
1	4.862	23.153	23.153
2	2.181	10.386	33.540
3	1.780	8.476	42.016
4	1.282	6.103	48.119
5	1.199	5.708	53.827
6	1.090	5.190	59.017
7	0.857	4.083	63.100
8	0.827	3.939	67.039
9	0.728	3.469	70.507
10	0.713	3.393	73.900
11	0.690	3.284	77.184
12	0.628	2.988	80.172
13	0.609	2.899	83.072
14	0.582	2.773	85.844
15	0.542	2.579	88.424
16	0.486	2.314	90.737
17	0.445	2.119	92.856
18	0.422	2.009	94.866
19	0.379	1.805	96.670
20	0.364	1.733	98.403
21	0.335	1.597	100.000

Table 10: Eigenvalues for Rokeach's terminal values

Factor number	Eigenvalue	% of variance	Cumulative %
1	4.876	28.684	28.684
2	1.542	9.070	37.754
3	1.311	7.709	45.463
4	1.084	6.376	51.839
5	1.025	6.027	57.865
6	0.960	5.647	63.512
7	0.825	4.852	68.365
8	0.777	4.569	72.934
9	0.660	3.879	76.813
10	0.635	3.735	80.548
11	0.610	3.586	84.134
12	0.581	3.417	87.552
13	0.488	2.869	90.421
14	0.455	2.678	93.099
15	0.431	2.532	95.632
16	0.397	2.334	97.966
17	0.346	2.034	100.000

Table 11: Eigenvalues for Rokeach's instrumental values

Factor number	Eigenvalue	% of variance	Cumulative %
1	6.490	36.054	36.054
2	1.728	9.601	45.654
3	1.431	7.952	53.606
4	0.942	5.233	58.840
5	0.868	4.823	63.663
6	0.839	4.659	68.321
7	0.740	4.114	72.435
8	0.655	3.637	76.072
9	0.593	3.292	79.364
10	0.552	3.069	82.433
11	0.513	2.850	85.284
12	0.488	2.714	87.997
13	0.462	2.564	90.561
14	0.403	2.237	92.798
15	0.370	2.058	94.856
16	0.338	1.877	96.733
17	0.323	1.793	98.526
18	0.265	1.474	100.000

Source: The authors
Notes: n = 431; Eigenvalues were computed with the principal component method

Table 12: Eigenvalues for meta-factor analysis

Factor Number	Eigenvalue	% of Variance	Cumulative %
1	4.953	33.021	33.021
2	1.534	10.229	43.250
3	1.447	9.644	52.893
4	1.088	7.256	60.149
5	1.045	6.969	67.118
6	0.889	5.927	73.045
7	0.673	4.484	77.529
8	0.614	4.096	81.625
9	0.517	3.449	85.074
10	0.480	3.201	88.275
11	0.410	2.731	91.006
12	0.405	2.698	93.704
13	0.349	2.324	96.028
14	0.331	2.204	98.232
15	0.265	1.768	100.000

Source: The authors
Note: n = 441

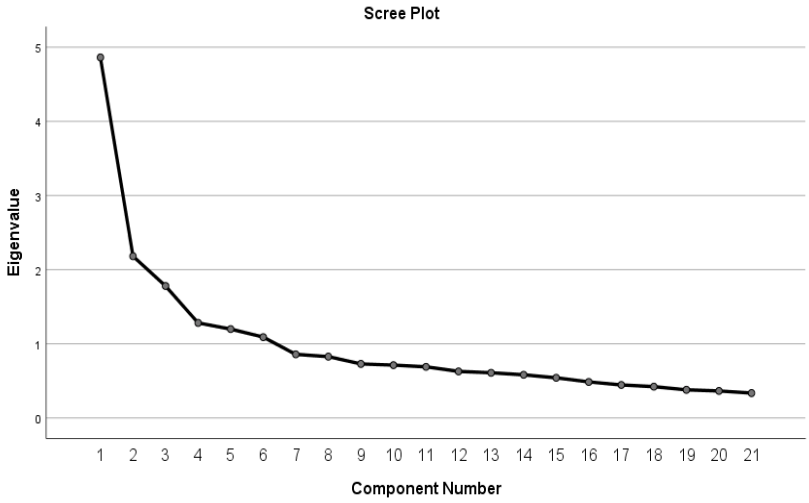

Fig. 3: Scree-plot for Schwartz's PVQ Source: The authors. Note: n = 426

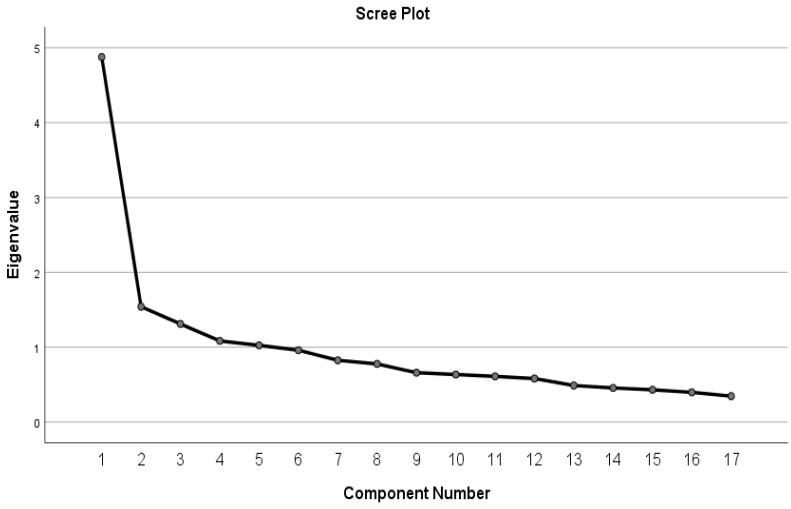

Fig. 4: Scree plot of Rokeach's terminal values Source: The authors. Notes: n = 427

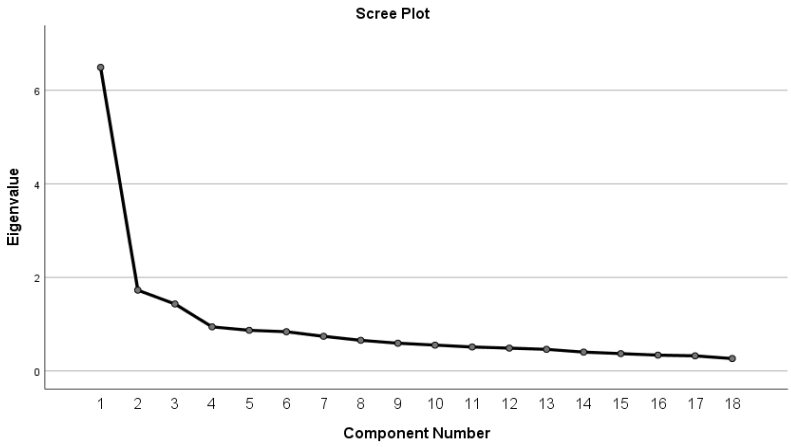

Fig. 5: Scree plot of Rokeach's instrumental values Source: The authors. Note: n = 431

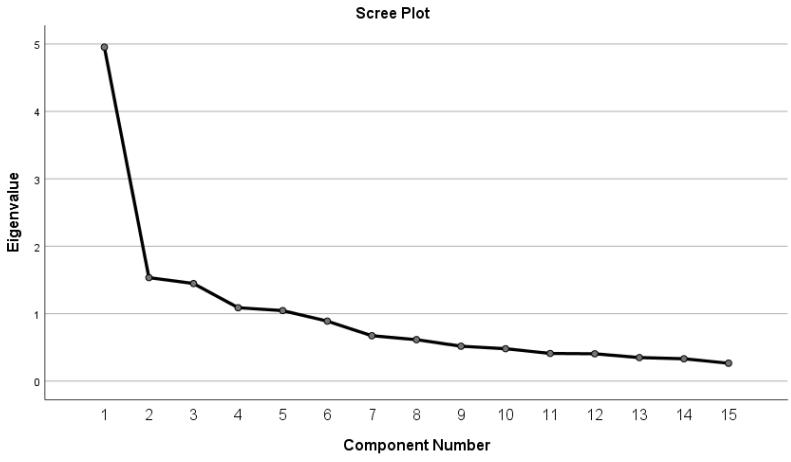

Fig. 6: Scree plot for meta-factor analysis Source: The authors. Note: n = 441

Conclusion

The objective of this study, and the hypothesis, was to assess the relative comprehensiveness of Schwartz's model by using the PVQ-21 to measure empirically and statistically the extent to which Schwartz's ten value types and their underlying structural dimensions incorporate all of and exceed Rokeach's values. The results show that:

- Schwartz's values are statistically linked to Rokeach's values in three of the five meta-factors (meta-factor MM 2, meta-factor MM 3, and meta-factor MM 5), which means they statistically converge in these three meta-factors
- Schwartz's values are statistically absent in meta-factor MM 1, which is based exclusively on Rokeach's values
- Rokeach's values are statistically absent in meta-factor MM 4, which is based exclusively on Schwartz's values

Our hypothesis that Schwartz's theoretical model of ten-value types is more comprehensive than Rokeach's values is supported by the meta-factors MM 2 to MM 5. In MM 2, MM3, and MM5 Schwartz and Rokeach's values converge. There is one meta-factor, namely MM 4, that is based exclusively on Schwartz's values. In this respect Schwartz supersedes Rokeach. However, there is also a meta-factor based exclusively on Rokeach's values, namely meta-factor MM 1. Meta-factor MM 1, therefore, challenges the relative comprehensiveness of Schwartz's model (with ten value types) and contradicts our hypothesis. These results correspond to the model in Fig. 2c above where neither instrument A nor instrument B is more comprehensive.

This statistical outcome shows that Rokeach's values found in meta-factor MM1: Individuation are not accommodated within Schwartz's theoretical model of ten-value types as measured by the PVQ-21. The six Rokeach values included in meta-factor MM1 are:

- Self-respect and Wisdom, together represent what we have called factor BB3: 'Individual Maturity'
- Broadminded, Independent, Imaginative and Courageous, which represent what we have called CC3: 'Visionary Behavior'

We could conclude by accepting this outcome. However, how researchers work with these results concerning Schwartz's theoretical model will depend on their research interests. We proceed to consider some options.

One response is to continue to use the PVQ-21 to collect data in values research and to acknowledge, along with Schwartz (1994, p. 22), that while the model together with the instrument approaches comprehensiveness it falls short because '[t]his question cannot be answered definitively. Researchers interested in comparing the same set of values over time may prefer this option because it will allow them to compare the results of new studies with those generated by one or more previous studies using the same version of PVQ-21. For them the scientific principle of comparing like with like using a standardized instrument over time is paramount.

Researchers who prioritize the universality of Schwartz's value types and the measurement thereof are likely to consider other options. They could extend Schwartz's model and the PVQ-21 by incorporating the six Rokeach values that we have shown are missing and then re-test our hypothesis. However, merely adding these six Rokeach values to Schwartz's model and the associated PVQ instrument is a very crude 'solution' because it ignores the theoretical imperative for these items to fit into Schwartz's theory of basic human values. While our empirical findings reported in this paper draw attention to a possible limitation in the 21-item PVQ, we argue that any enhancements of this instrument should be theoretically informed and consistent with the internal logic of Schwartz's established theory. Consequently, other theoretically more sophisticated options should be considered. To this end, we have found literature that discusses other longer questionnaires based on Schwartz's theory (see Schwartz, 1992; Schwartz et al., 2012; Schwartz and Cieciuch, 2021; Saris et al., 2013; Cieciuch and Davidov, 2012). Furthermore, Schwartz (Schwartz and Cieciuch, 2021) has revised his theoretical model to include 19 more narrowly defined values. It is here that we have looked for clues to how the six Rokeach values could fit into Schwartz's theory and measurement instruments.

Do the longer versions of the PVQ, which were designed by (Saris *et al*., 2013) and discussed earlier, accommodate the above-mentioned six Rokeach values? Table 8 shows that Rokeach's six values are present in PVQ-40 and the PVQ5X/PVQ-RR, albeit somewhat obscured. One could proceed to test whether these other instruments are more comprehensive. The presence of these six Rokeach values in longer versions of the PVQ with values based on the same core theory conceptually and theoretically supports their accommodation. Alternatively, one could replace the PVQ-21 with Schwartz's 56 (sometimes 57) item SVS, which according to Table 8 explicitly includes the six Rokeach values. The problem with this option is that the SVS measures cultural or societal values and not personal values.

The preferred options for researchers in response to the results of our study will probably depend on whether they prioritize: (i.) Universality (especially the comprehensiveness) of the model and measurement instrument they use in their values research; (ii.) comparability using a standardized instrument over time (see Schwartz and Cieciuch 2021); or (iii.) theoretical continuity and coherence between the model and measurement instrument. These options are not necessarily

mutually exclusive. Whatever options are preferred, further research on this topic is required and on a larger scale.

Appendix

Rokeach Value Survey (RVS): Terminal Values

Below is a list of values in alphabetical order. We are interested in finding out the relative importance of these values to you.

Please assess the importance of each of the following values to you. Tick one box.

	very import	important	somewhat important	a little important	not important	not important at all
AMBITIOUS (hard-working, aspiring)	□1	□2	□3	□4	□5	□6
BROADMINDED (open-minded)	□1	□2	□3	□4	□5	□6
CAPABLE (competent, effective)	□1	□2	□3	□4	□5	□6
CHEERFUL (light-hearted, joyful)	□1	□2	□3	□4	□5	□6
CLEAN (neat, tidy)	□1	□2	□3	□4	□5	□6
COURAGEOUS (standing up for your beliefs)	□1	□2	□3	□4	□5	□6
FORGIVING (willing to pardon others)	□1	□2	□3	□4	□5	□6
HELPFUL (working for the welfare of others)	□1	□2	□3	□4	□5	□6
HONEST (sincere, truthful)	□1	□2	□3	□4	□5	□6
IMAGINATIVE (daring, creative)	□1	□2	□3	□4	□5	□6
INDEPENDENT (self-reliant, self-sufficient)	□1	□2	□3	□4	□5	□6
INTELLECTUAL	□1	□2	□3	□4	□5	□6
(intelligent, reflective) LOGICAL	□1	□2	□3	□4	□5	□6
(consistent, rational) LOVING (affectionate, tender)	□1	□2	□3	□4	□5	□6
OBEDIENT(dutiful,	□1	□2	□3	□4	□5	□6
respectful) POLITE (courteous, well-mannered)	□1	□2	□3	□4	□5	□6
RESPONSIBLE (dependable, reliable)	FOR £1	□2	□3	□4	□5	□6
SELF-CONTROLLED (restrained, self-disciplined)	□1	□2	□3	□4	□5	□6

Rokeach Value Survey (RVS): Instrumental Values

Below is another list of values.

Please assess the importance of each of the following values to you. Tick one box.

	Very important	Important	Somewhat important	A little important	Not important	Not important
AMBITIOUS (hard-working, aspiring)	□1	□2	□3	□4	□5	□6
BROADMINDED (open-minded)	□1	□2	□3	□4	□5	□6
CAPABLE (competent, effective)	□1	□2	□3	□4	□5	□6
CHEERFUL (light-hearted, joyful)	□1	□2	□3	□4	□5	□6
CLEAN (neat, tidy)	□1	□2	□3	□4	□5	□6
COURAGEOUS (standing up for your beliefs)	□1	□2	□3	□4	□5	□6
FORGIVING (willing to pardon others)	□1	□2	□3	□4	□5	□6

Continue

HELPFUL (working for the welfare of others)	□1	□2	□3	□4	□5	□6
HONEST (sincere, truthful)	□1	□2	□3	□4	□5	□6
IMAGINATIVE (daring, creative)	□1	□2	□3	□4	□5	□6
INDEPENDENT (self-reliant, self-sufficient)	□1	□2	□3	□4	□5	□6
INTELLECTUAL (intelligent, reflective)	□1	□2	□3	□4	□5	□6
LOGICAL (consistent, rational)	□1	□2	□3	□4	□5	□6
LOVING (affectionate, tender)	□1	□2	□3	□4	□5	□6
OBEDIENT (dutiful, respectful)	□1	□2	□3	□4	□5	□6
POLITE (courteous, well-mannered)	□1	□2	□3	□4	□5	□6
RESPONSIBLE (dependable, reliable)	FOR £1	□2	□3	□4	□5	□6
SELF-CONTROLLED (restrained, self-disciplined)	□1	□2	□3	□4	□5	□6

Schwartz's PVQ-21 (female version)

Here we briefly describe some people. Please read each description and think about how much each person is or is not like you. Tick the box to the right that shows how much the person in the description is as you

	How much like you is this person?					
	Very much Like me	Like me	Some-what like me	A little like me	Not like me	Not like me at all
1. Thinking up new ideas and being creative is important to her. She likes to do things in her original way. [SD1]	□1	□2	□3	□4	□5	□6
2. It is important to her to be rich. She wants to have a lot of money and expensive things. [PO1]	□1	□2	□3	□4	□5	□6
3. She thinks it is important that every person in the world is treated equally. She believes everyone should have equal opportunities in life. [UN1]	□1	□2	□3	□4	□5	□6
4. It's important to her to show her abilities. She wants people to admire what she does. [AC1]	□1	□2	□3	□4	□5	□6
5. she needs to live in secure surroundings. She avoids anything that might endanger her safety. [SE1]	□1	□2	□3	□4	□5	□6
6. She likes surprises and is always looking for new things to do. She thinks it is important to do lots of different things in life. [ST1]	□1	□2	□3	□4	□5	□6
7. She believes that people should do what they're told. She thinks people should follow rules at all times, even when no one is watching. [CO1]	□1	□2	□3	□4	□5	□6
8. It is important to her to listen to people who are different from her. Even when she disagrees with them, she still wants to understand them. [UN2]	□1	□2	□3	□4	□5	□6
9. It is important to her to be humble and modest. She tries not to draw attention to herself. [TR1]	□1	□2	□3	□4	□5	□6
10. Having a good time is important to her. She likes to "spoil" herself. [HE1]	□1	□2	□3	□4	□5	□6
11. It is important to her to make her own decisions about what she does. She likes to be free and not depend on others. [SD2]	□1	□2	□3	□4	□5	□6
12. It's very important to her to help the people around her. She wants to care for their well-being. [BE1]	□1	□2	□3	□4	□5	□6
13. Being very successful is important to her. She hopes	□1	□2	□3	□4	□5	□6

Continue

people will recognize her achievements. [AC2]						
14. It is important to her that the government ensures her safety against all threats. She wants the state to be strong so it can defend its citizens. [SE2]	□1	□2	□3	□4	□5	□6
15. She looks for adventures and likes to take risks. She wants to have an exciting life. [ST2]	□1	□2	□3	□4	□5	□6
16. It is important to her always to behave properly. She wants to avoid doing anything people would say is wrong. [CO2]	□1	□2	□3	□4	□5	□6
17. she needs to get respect from others. She wants people to do what she says. [PO2]	□1	□2	□3	□4	□5	□6
18. It is important to her to be loyal to her friends. She wants to devote herself to people close to her. [BE2]	□1	□2	□3	□4	□5	□6
19. She strongly believes that people should care for nature. Looking after the environment is important to her. [UN3]	□1	□2	□3	□4	□5	□6
20. Tradition is important to her. She tries to follow the customs handed down by her religion or her family. [TR2]	□1	□2	□3	□4	□5	□6
21. She seeks every chance she can to have fun. It is important to her to do things that give her pleasure. [HE2]	□1	□2	□3	□4	□5	□6

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Author's Contributions

All authors equally contributed to this study.

Ethics

This article is original and contains unpublished material. The corresponding author confirms that all of the other authors have read and approved the manuscript and no ethical issues are involved.

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