Can we extend Schwartz's value theory in order to measure organizational Values?
Using a pilot study in the context of University.

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1. Introduction

The rate at which organizations are increasing with propensity in every sphere and arena of social life is indicative of its importance in the society. Organizations have perceived importance on the lives of those within it. The modern society's structure ought to be stretched to include relations between the persons living in it (Scott 1981). Society as well as organizations are dynamic and keep changing in the very structural elements and values of which it is composed (Coleman, 1974). Practices and standards shared by members living in the same environment can be referred to as organizational values (Tindale, Smith, Thomas, Filins, & Sheffey, 1996.) In other words they can also include shared mental representations about organizational principles.

Different approaches have been proposed in order to measure values of organization (e.g. Borg et al., 2011; Ros & Grad, 1991). The most prominent example is Rokeach (1973). Rokeach (1973:5) defines value 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". Based on this, he developed a value-survey (RVS) consisting of two lists of values - measuring instrumental (preferable behavioral) and terminal (desirable and end-state existing) values. Rokeach (1973, p.38) even proposes to apply its instrument for "a group, a social organization, a total society, or even an ideal society". Most recently, Tuulik et al. (2016) pointed out, that the RVS (Rokeach Value Survey) was and is still popular and widespread used. However, they (ibid) concluded "the values lists are not sufficiently relevant enough today to measure and describe the wide and colorful variety of values" (p.151) by mentioning certain dispensable value. Besides, researcher may face difficulties regarding cross-cultural comparisons as well, since non-comparable interpretations of those values are limiting the usability (ibid).

Building on Rokeach's theory of values, Schwartz developed the theory further focussing on human and cultural values (Schwartz 1992; 2008; 2012). Although he incorporated many views of Rokeach, Schwartz did improve Rokeach's theory, which does not adequately explain the underlying structure of value systems.

Schwartz (1992) developed his theory of human values based on his conviction that values are based on those human needs that are universal. Schwartz, following Rokeach approach, sees Values as "desirable transsituational goals, varying in importance, that serve as guiding principles in the life of a person or other social entity" (Schwartz, 2008, 2012).

Schwartz designed several instruments in order to measure values - the Schwartz Value Survey (SVS; Schwartz, 1992) as operationalization of values desirable in a society and the Portrait Values Questionnaire (PVQ; Schwartz et al., 2001) in terms of assessing the personal importance of those values.

The SVS which was the first of the instrument developed by Schwartz is to be used in measuring the individual differences in value priorities (Schwartz 2008). Briefly, Schwartz developed his instruments (see above) for measuring individual and group values. He attempted to measure societal values (SVS) and personal values (PVQ). But, organizational are not identical with group or personal values – they are "somewhere" in between.

Our concern in this paper is to use Schwartz value theory to measure organizational values.

The question is: Are organisations sufficiently like humans for us to study their values using instruments designed to measure human value priorities? If the answer is "yes" then a further question is whether Schwartz's PVQ, which is specifically designed to measure human values of individuals and groups, is at all suitable for measuring organisational values.

Correspondingly, the paper is structured as follows: First, we describe Schwartz value theory and provide an overview of debates in the literature about applying his theory of basic values to measure organizational values. Second, we describes the design of the pilot study including the methods used. Third, we report our findings. Last, we discusses the results in relation to our research objective and the literature.

2. Schwartz's Theory of Basic Values and the PVQ

Schwartz's Theory of Basic Values (2012) defines values as beliefs and desirable goals, which serve as guiding principles in people's lives. It consists of ten distinct motivational value orientations, which relate to each other either harmonious or dissenting. The "structure" of these values reflects relations of discrepancy and correspondence among values and not to their relative importance (Schwartz 2009). Fig. 1 shows this structure as a **two dimensional model, which embeds the values into four** value domains (Self-Transcendence, Conservation, Self-Enhancement, Openness to Change). By means of the circular diagram, Schwartz underlines

"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). Thus, when one tries to pursue two values and they come in conflict, these values are represented in the opposing direction in the circular structure below, while symmetrical values are adjacent to one another. The circular structure portrays the total set of relations.
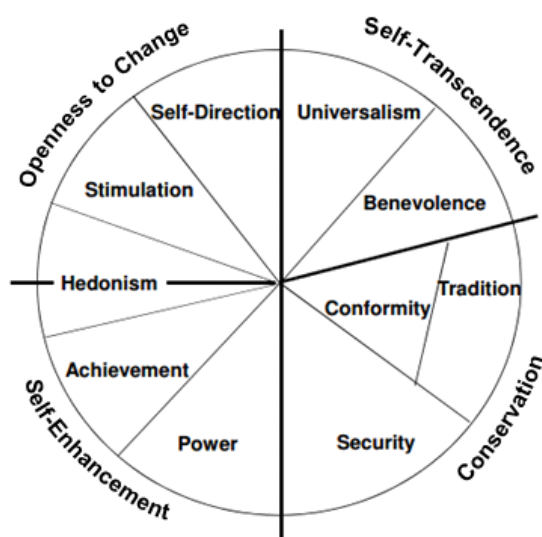

Fig. 1 Schwartz's motivational value types and higher order value domains. Source: Schwartz, 2012:9

Table 1 below summarises the ten value orientations, their definitions and exemplary values (see De Wet, Wetzelhütter, Bacher, 2018). For a more detailed discussion see also Schwartz (2009).

Table 1 Schwartz's Motivational Values (Schwartz 1992)

Value Type	Definition	Exemplary values
Power	Social status and prestige, control or dominance over people & 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, fulfilment
Stimulation	Excitement, novelty & challenge in life	Excitement, variety
Self-direction	Independent of thought and action, creating, exploring	Creativity, curiosity, freedom
Universalism	Understanding, appreciation, tolerance, & 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 & violate social expectations or norms	Courtesy, obedience, honour
Security	Safety, harmony & stability of society, of relationships and of self	Social order, organisation

Schwartz has developed several instruments in order to measure values. One of them is the widely used 21-item PVQ (Portrait Values Questionnaire) for measuring individual value orientations. The portraits used in the questionnaire are gender-matched with the respondent in order to allow respondents to relate better to the portraits – a female or male version is used. Each item or portrait describes a particular goal, aspiration or wish which refers to a single underlying value (Schwartz 2012). For instance, 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 A). 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").

2.1 Applying Schwartzs' theory of basic values to measure organizational values.
The possibility of adapting/extending Schwartzs' theory and instruments to other aspects has been demonstrated in some organizational studies. For instance, his Theory was applied for organizations by Porto and Ferreira (2017), Consiglio et al. (2016), Tevrüz et al. (2010) in order to measure (work) values of employees. Furthermore, the PVQ has been adapted to the work context (see e.g. Ros & Grad, 1991, Avallone, et al., 2010) – but maximal changes are made. However, these approaches either focus on values of a certain target group of the organization (e.g. employees, clients) or apply an instrument, which widely differs from Schwartz instruments. Therefore, comparisons of organisational and personal values or analyses focusing on the

influences of organisational on personal values are, to the best of our knowledge, not possible based on the existing instruments. For instance, Schwartz (2006:5) links education and individual values in his Theory of Values and concludes that education influences values priorities. This means, educational institutes transmit culture and values to the young ones. These organisations are part of agents of socialisation along side people or groups. Moreover, they influence value priorities, self-concepts, emotions, attitudes and behaviour. However, in order to investigate whether and to which extent educational institutions as agent of socialisation (special organisation) influence the students' values an adopted instrument is needed.

With this in mind, we want to measure organizational values by means of adopting the PVQ with only minimal changes, in order to compare them to personal values. In this context, minimal changes are important in order to retain the original intended aim of the PVQ without doing much alteration to them. Thus in the new design, no new potentially universal values are identified.

Moreover, as a novelty, we try to use the PVQ in order to measure the value orientation of students in the university setting. In this context, University as an educational institution is considered as an organization, which is responsible for socialisation as one of their tasks.

Consequently, we are interested in measuring the transmission of corresponding values. Therefore, our target group are students, which is why we did use the PVQ.

3. Methods

As mentioned in the introduction, we aimed to adapt the idea of the PVQ for measuring organizational values. Consequently, we have undertaken a pilot study in order to test whether Schwartz's Portrait Values Questionnaire (PVQ) can be adapted (albeit minimally).

The first attempt was poor with some sort of ambiguities, as the respondents have had some limitations in their comprehension of the questions. We, therefore, developed the PVQ further by seeking the constructs that reflect the understanding of the target group. Finally, we "created" the PVQ-University (PVQ-U). The adaption procedure is reported in more detail below.

3.1. Adaption of the PVQ-21

We adapted the PVQ-21 stepwise. The first attempt of the adaption was to change the PVQ-21 at a minimum level: just minor adjustments were made, in order to refine Schwartz's PVQ-21 for

its application within a university's context. This means, the original statements were reformulated to a minor degree - e.g. *"Thinking up new ideas and being creative is important to her. She likes to do things in her own original way"* as follows: *"Thinking up new ideas and being creative is important to my university. My university likes to do things in its own original way"*. In this way, we shifted the formulation of each of the 21 statements from an individual to an organizational description.

In order to test the adapted instrument a pretest was conducted at the Johannes Kepler University (JKU) in Linz, Austria. The purpose behind it was to test the instrument for a lager project, that covers value transmission. The target group consisted of undergraduate sociology students. Data was collected by means of cognitive and standardized pretesting. In more detail: individual interviews (n=3) and one group discussion (n=4) was performed. In order to gain the needed information three different techniques were applied: retrospective think aloud, comprehension and information retrieval probing. Apart from that, a standardized pretest was conducted in terms of a classroom setting. The students (n=38) were invited to fill out the questionnaire during or after a lecture/seminar. In this way, we identified some disadvantages of those changes at the minimum level. Some statements appeared to be either very abstract respectively unclear/vague (e.g. "*It is important to my university to be loyal to its friends.*" or *"My university likes the unexpected and is always looking to discover new things"*). Other statements appeared to be inappropriate respectively unsuitable (e.g. *"My university looks for adventures and likes to take risks."* or *"My university seeks every chance to have fun."*).

Based on findings of pretesting the questionnaire, we reformulated the statements further. We shifted the focus on what students think, that the University wants them to become. Finally, the evolved PVQ-U consists of e.g. *"Students thinking up new ideas and being creative is important to GOU. Students should do things in their own original way."*

The analysing procedure for testing reliability and validity of the new instrument (PVQ-U) is reported below.

3.2 Sample selection and sample description

Data were collected at the Johannes Kepler University (JKU) in Austria and the Godfrey Okoye University (GOU) in Nigeria. The survey was carried out between October and December 2018.

It took place in terms of a classroom setting by means of a self-administered paper & pencil questionnaire (PAPI). We aimed to interview "entrants" and "advanced" students in order to be able to examine possible differences based on the duration of study. The reason for this decision was the assumption that, in contrast to "entrants", advanced students should know the universities values (values which the university wants to transmit) better and therefore should be able to provide more reliable and valid data.

At this point it hast to be mentioned that students at the JKU (Austria) are not organized in classes. They choose which, when and how many lectures/seminars they want to pass by themselves during one semester. However, their decisions are based on guidelines of the curriculum – e.g. some courses are required at the beginning of the study. Therefore, we selected certain lectures (orientation courses which are required courses for first year students) and seminars (courses for advanced students) for data collection. All Students who took part at those lectures/courses were asked to participate in the survey.

At GOU (Nigeria) the students are organized in classes. This classification is based on the discipline they study. As such all students studying, for example, sociology are classified according to their year of admission. They attend lectures together in this order. However, there are some general courses which they attend with other students studying other disciplines. We selected students of sociology and others who are, though in the same faculty (Faculty of social and management sciences), but are studying other disciplines to make up for our data collection. The students where given the freedom to chose to participate in the data collection or not to participate.

Altogether 109 students in their 1st year and 180 advanced students took part in the survey. At the JKU advanced students participated to a proportional higher degree (43.6%) than those studying at GOU (32.7%). However, the difference is not significant (Table 1).

Table 1: Sample Composition

Country, University	Entrants (%)	Advanced (%)	n
Austria, JKU	56.4	43.6	133
Nigeria, GOU	67.3	32.7	156
Total	62.3	37.7	289

Chi²=3.642; p=.056

Table 2 provides information about selective demographic characteristics of the surveyed students. The majority of the Austrian respondents are female (77.3%) and speak German as their 1st Language (84.2%), while just 54.8% of the Nigerian students are female and 73.2% speak Igbo as their "mother tongue". It is important to note that the GOU (Nigeria) is located in the South-Eastern part of Nigeria where the ethnic group is predominantly Igbo and as such Igbo is widely spoken. The proportion of respondents from urban areas is identical with 46.2% of the Austrian and of the Nigerian students. The Nigerian students are younger with a mean age of 19.3 years, compared to 25.5-year-old students in Austria.

Table 2: Selected demographic characteristics

Country, University	Females (n)	Mean Age (SD; n)	Urban	1st Language (n)
Austria, JKU	77.3% (132)	25.5 years (9.262; 132)	46.2% (130)	Deutsch: 84.2% Other[a]: 15.8% (133)
Nigeria, GOU	54.8% (155)	19.3 years (3.054; 138)	46.2% (143)	Igbo: 73.2% English: 13.4% Other[b]: 13.4% (149)

(a): Boki, Chichewa, Efik, Esan, Eteche, Fang, Hausa, Idoma, Igala, Ijaki, Ikwere, Jukun, ~~Ibo~~ Igbo
(b): Bosnisch/Serbisch/Kroatisch, Türkisch, Georgisch, Persisch, Polnisch, Rumänisch, Slowakisch, Spanisch

3.3 Techniques of Analysis

Values of organizations are transmitted by their representations. Therefore, the question arises: Are we able to measure those (un)intentional "transmitted values" using the PVQ-21, which is designed to measure human values? More precisely for the present case: are we able to measure values of universities perceived by their students?

In order to do so, we adapted the PVQ-21 (see above), with **the objective** to test the **reliability** (stability) and **validity** (suitability) of the adapted instrument (PVQ-U). In more detail: we use **Cronbach's alpha** and a **variance index** to measure **reliability** and **we use linear regressions**, **multidimensional** scaling (MDS) and **arithmetic means** in order to test the **validity** of the instrument as described in more detail below.

Cronbach's alpha (Cronbach 1951; Zeller & Carmines 1980, p. 56-60) measures how closely related a set of items is as a group. For measuring Cronbach's Alpha of the PVQ-U, we took into account that pairs of items of the PVQ-U (in accordance to Schwartz's PVQ) measures the same

motivational value orientation. Based on this, we calculated the average correlation of the items (formula i) and included 10 dimensions (formula ii), since the model consists of 10 value orientations (for details see de Wet, Wetzelhütter and Bacher, 2018):

(i)

$$\bar{r}_{PVQ\_U} = \frac{\sum_{i \neq U\_UN} r_{i,i^*} + \frac{r_{U\_UN1,U\_UN2} + r_{U\_UN1,U\_UN3} + r_{U\_UN2,U\_UN3}}{3}}{10}$$

whereas r_{i,i^*} is the correlation of the two items i and i* for each of the ten value orientations, e.g. Self-direction Item 1 and Self-direction Item 2, and where $r_{UN1,UN2}$, $r_{UN1,UN3}$ and $r_{UN2,UN3}$ are the correlations for the three items for Universalism.

(ii)

$$\alpha_{PVQ\_U} = \frac{10 \cdot \bar{r}_{PVQ\_U}}{1 + (10-1) \cdot \bar{r}_{PVQ\_U}}$$

Internal Consistency is verified, when the adapted Cronbach's Alpha (α_{PVQ_U}) reaches a value of 0.8.

The **variance-index** gives information on the agreement vs. consent/dissent of the perceived values, transmitted by the university's representations. The index is calculated as the variance of the respective item proportional to the average variance of all 21 PVQ-U items.

Homogeneity is verified, when the variance index per item corresponds to the average. Therefore, a variance-index between 75% and 125% indicates a homogenous measurement. At least 75% of the items should verify homogeneity.

The suitability of the measurement is indicated by **construct validity**. Construct validity is given, when the perceived values (transmitted by the university's representations) are independent from personal values. Consequently, it is tested, based on **linear regressions**, to what extend the perceived university values, measured by the PVQ-U, are independent of personal values, measured by the PVQ.

Construct validity is verified, the model, testing the influence of personal values on the perception of the university's values, is insignificant. At least 75% of the models should verify construct validity.

Content validity is tested by computing the two-dimensional representation of the perceived university values, using **multi dimensional scaling** (MDS) in SPSS (PROXSCAL), and counting the number of adjustments needed to fit Schwartz's model In accordance with Schwartz (1992;

2009) we performed a Smallest Space Analysis (SSA) by applying mean centering ($x_i^{\bar{x}} = x_i - \bar{x}$) and used the starting configuration stated by Schwartz (2009).

About **Criterion validity** the closeness of the ranking of university's values, comparing the students perception to the expectations of experts regarding this matter, provides insight into it. For this purpose, we formulated three hypothesis about the priorization and three about the neglegctation of values. This procedure involves 12 or 13 items out of 21, since one value is measured by two and in one case (Universalism) by three items. The ranking of the items is based on the arithmetic of each item.

Criterion validity is met, when the prioritized/neglected values of the university, perceived by students, do match the expectations of experts. This should be true for at least for 75% of the concerned items.

To sum up, the following threshold vales are applied:

A homogenous measurement is verified when:

    a. **Cronbach's Alpha** (α_{PVQ_U}) ≥ 0.8

    b. **Variance index** of **75% of the items** is between **75% and 125%**

A suitable measurement is verified when:

    c. **Linear regressions** are for at least 75% of the models insignificant

    d. **MDS-Models** reveal a GoF1 of 75% at a minimum

    e. **Ranking** of the PVQ-U items of students meets the expectations of experts for 75% of the concerned items.

4. Results

4.1 Reliability of measurement

4.1.1 Internal consistency

Cronbach's Alpha of the PVQ-U reaches satisfactory results (>0.8) and therefore supports the measurement of by students perceived "university values" based on both – the Austrian (JKU)

and Nigerian (GOU) data. However, the internal consistency regarding the PVQ of entrants at GOU achieves a lower level of about 0.7.

Table 1: Testing Reliability (modified Cronbach's Alpha)

Country	Student Experience (n)	PVQ	PVQ-U
Austria, JKU	Entrants (75)	0.84	0.86
	Advanced (58)	0.88	0.88
Nigeria, GOU	Entrants (105)	**0.71**	0.89
	Advanced (51)	0.86	0.94

The cultural diversification of the students coupled with the fact that more fresh students who are not yet conversant with the university's system participated in the data collection could be the reason for the PVQ-Items variation at GOU (Nigeria).

More precisely, the correlation matrix for each pair of item measuring one of the 21 university values (PVQ-U), differentiated by Country and student experience, makes it evident (Table 2): three pairs of items correlate weakly or not at all (<0.3), manly caused by the Austrian data. This means, those pairs of items does not measure the same perception of the underlying value.

Table 2: Correlation of items measuring the same value (Pearsons r), PVQ-U

Country	Exper-ience (n)	SD1, SD2	UN1, UN2	UN1, UN3	Un2, UN3	BE1, BE2	TR1, TR2	CO1, CO2	SE1, SE2	PO1, PO2	AC1, AC2	HE1, HE2	ST1, ST2
Austria, JKU	Entrants (68-71)	.651**	.438**	.476**	**.129**	.328	**.129**	.490**	.510**	**-.003**	.477**	.571**	.343**
	Advanced (54-56)	.434**	.576**	.383**	.537**	**.027**	**.291***	.510**	.488**	**.219**	.410**	.731**	.547**
Nigeria, GOU	Entrants (90-94)	.360**	.334**	.574**	.486**	.419**	**.241***	.475**	.519**	.377**	.494**	.486**	0.334
	Advanced (47-49)	.369**	.537**	.458**	.410**	.587**	.374**	.530**	.613**	.410**	.723**	.661**	.739**

Lastly, the measurement of "Tradition" (TR) and "Power", as university values (PVQ-U), seems to reveal problems regarding internal consistency.

4.1.2 Homogeneity

Regarding homogeneity, the variance-index (Table 3) shows that, students in Austria answer the items of the PVQ-U relatively homogenous. This is true for entrants at the JKU with 71% (15

items out of 21) and advanced students with 62% (13/21) homogenous answered items. At GOU, the variance differs more seriously, whereas advanced students still reach 52% (11/21) homogenous answered items. However, the variance based on the data of entrants at GOU differs enormously with just 14% (3/21) homogenous measures.

Table 3: Variance homogeneity based on proportion of (In)Homogenous Items

Country	Experience	$\overline{v^2}$	Variance Index			n
			<75%	>125%	Homogenous	
Austria, JKU	Entrants	1.314	19%	10%	71%	21
	Advanced	1.654	14%	24%	62%	21
Nigeria, GOU	Entrants	1.516	57%	29%	**14%**	21
	Advanced	1.844	29%	19%	**52%**	21

Regarding entrants at GOU, a comparable high number (12/21) of items with a "below-average" variance-index is noticeable. This result might partially be caused by the fact that a relatively high proportion of entrants (37%) choose the first answer category for at least 15 items out of 21, while no one at the JKU did this in a compareable extent.

Furthermore, it could also be that the students did not want to present a negative image of the GOU.

Fact is: items that are concerned, rather regardless of country and student experience are SD1, UN1, SE2, AC2, HE1 and ST2.

4.2 Validity of measurement

4.2.1 Construct validity

We tested the influence of personal values (measured by the PVQ) on the perceived University value (measured by the PVQ-U). Table 4 shows the proportion of significant models (linear regressions).

Table 4: (In)dependency of university values (Linear Regressions)

Country	Experience	Proportion of Models		n
		Sig.	N.s.	

Austria, JKU	Entrants	24%	76%	21
	Advanced	10%	90%	21
Nigeria, GOU	Entrants	62%	38%	21
	Advanced	33%	67%	21

The results show differences, depending on country and experience of students. The dependency of university values from personal values of Austrian students decreases with the duration of the study – from 5 (24%) to 2 (10%) significant models. Regarding Nigerian students, the proportion of significant models is higher, but also decreases with the duration of study from 13 (62%) to (33%). The reason for this may be that the students transferred their individual value preferences to be also those of the university.

Problematic items for measuring university values at GOU are, independently of the students experience, SD1, UN1+3, SE1+2, whereas SE1+2 also applies for JKU (for details, see table X in the appendix).

4.2.2 Content validity

Figures 2a-d provides the graphic representations of the perceived university value structure, differentiated by country and separated by student experience. The number of moves needed to reproduce Schwartz's two-dimensional model as well as the Goodness of Fit (GoF1) measure is noted below.

Figure 2: Two-dimensional structure of the PVQ-U

a)   JKU: Entrants   b) JKU: Advanced
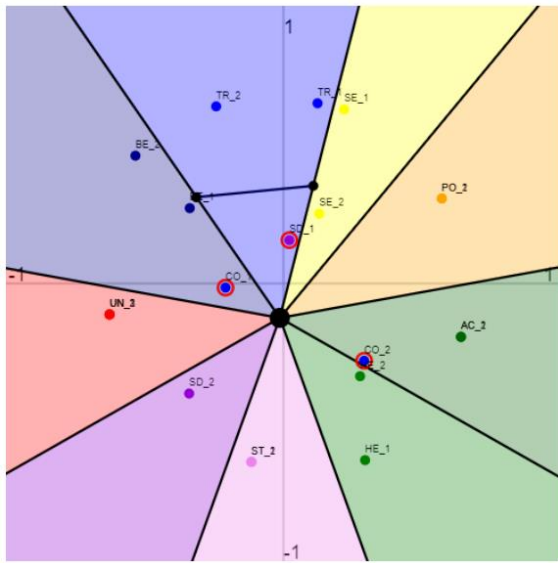
n=61 GoF1: 85%; Moves: 3; Steps: 7   n=48 GoF1: 95%, Moves: 1; Steps: 2
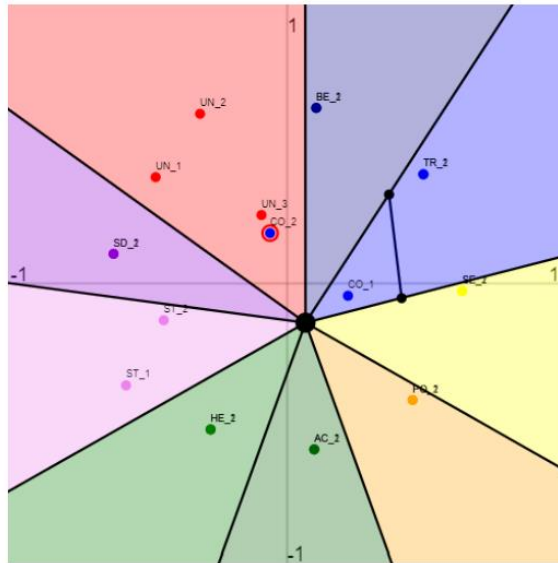
c)   GOU: Entrants   d) GOU: Advanced
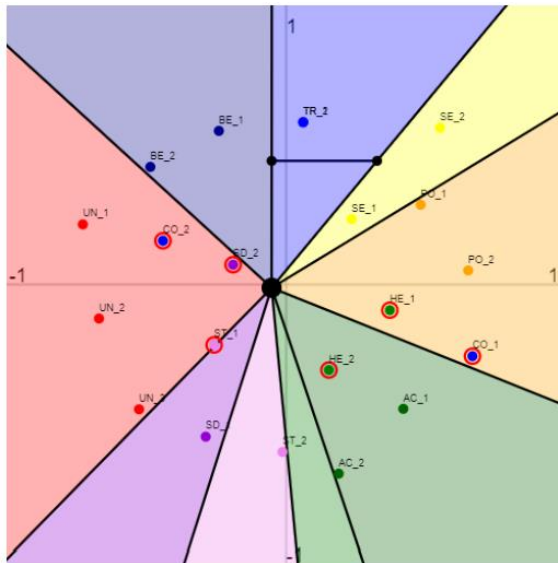
n=81; GoF1: 70%; Moves: 6; Steps: 10   n=43; GoF1: 100%, Moves: 0; Steps: 0
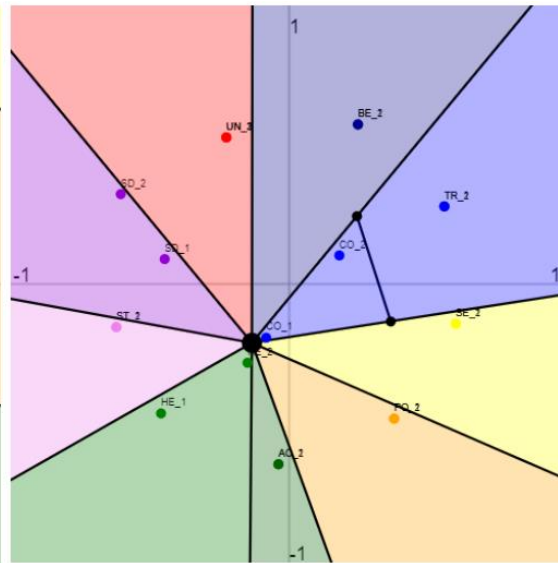
The number of moves, which have to be made, in order to reproduce the theoretical model, ranges between 0 (GOU, advanced students) to 6 (GOU, entrants). However, once again entrants at the GOU compare relatively poorly (GoF1: 70%) to advanced students in both countries (GoF1: 95%-100%) as well as to entrants at JKU (GoF1: 85%).

Problematic items, as they placed in the wrong sector, are in particular: CO1+2, but SD1+2, ST1 and HE1+2 are also partly wrong placed.

4.2.2 Criterion validity

In order to test criterion validity, we formulated hypothesis regarding the students perception of the University's prioritization and negligence of values. The hypothesis are based on the expectations of experts (what they assume, students should perceive as for the university being relevant or irrelevant values). Accordingly, experts predict, that students perceive their university to:

JKU: **prioritise** (H1) AC, SD, CO and **neglects** (H2) PO, TR, ST;

GOU: **prioritise** (H3) **AC, SD, UN** and **neglects** (H4) **PO, TR, ST;**

For testing these hypotheses, we calculated the arithmetic mean for each item of the PVQ-U and ranked them. Prioritised values should have a low arithmetic mean and vice versa neglected values a high arithmetic mean. All in all the rank order of 12 (H1, H2) and 13 (H3, H4) items is tested. Table 4 shows the proportion of items placed as expected (verified) and vice versa (falsified). Advanced students at the JKU reach a satisfactory result with 75% items ranked as expected. Entrants and advanced at GOU as well as entrants at JKU are below that threshold with 69% to 58%.

Table 4: Testing Hypothesis "differences in the mean"

| Country | Experience | PVQ-U | | Number of testet items |
		Verified	Falsified	
Austria, JKU	Entrants	58%	42%	12 (excl. UN)
	Advanced	75%	25%	12 (excl. UN)
Nigeria, GOU	Entrants	69%	31%	13 (incl. UN)
	Advanced	62%	38%	13 (incl. UN)

Problematic items, whose rank order deviates from the expectations, independently of the students' experience, are PO2, CO1 and ST1 (JKU) and UN (GOU). For details, see table X in the appendix.

5. Conclusions and explanations

To sum up, the following table gives an overview about reliability and validity of the measurement of the PVQ-U, differentiated by country and student experience. Obviously, the PVQ-U measures relatively well in case students are studying at the JKU in Austria and this preferably at an advanced level – four of five tests are verified. Experience is also relevant for the measurement in Nigeria. However, the outcome contradicts a proper measurement – just two of five tests are verified.

Table 5: Overview verifying and falsifying results (v=verified, f=falsified)

Test	Austria, JKU		Nigeria, GOU	
	Entrants	Advanced	Entrants	Advanced
Cronbach's Alpha: >0.8	V	V	V	V
Variance Index = 75%-125%, of 75% Items	F	F	F	F
Linear regression models: ≥75% insignificant	V	V	F	F
GoF of MDS ≥ 75%	V	V	F	V
Ranking of Items match the experts expectations ≥ 75%	F	V	F	F

Based on the outcome, we can conclude: the measurement of the PVQ-U is supported by

* internal consistence (Cronbach's Alpha) – based on data from Austria and Nigeria;

* independency of personal values – based on data from Austria;

* graphic reproduction – except for entrants at GOU;

* criterion validity based on data from advanced students at JKU;

Apart from that, variance homogeneity fully **contradict** the measurement. Probably the problem is as a result of the assertion that the measurement is, to a greater extent, directed to western society.

However, the question is, how can the measurement be improved? To answer this question, we need to consider challenges caused by several items of the PVQ-U and its consequences. In this regard, Table 6 gives an overview including the concerned items respectively. values (when both/all items of one value are concerned).

Table 6: Overview of reasons and consequents for items worthy of improvement

Testing	Challenge	Consequence	Value/Items
Homogeneity	**Scope of University**: **broad** (study staff vs. students union, etc.) **Similarity of statements** of diff. items: impression of repetition	Underlying information vary: **high variance** Looking up: **low variance**	**SD1, UN1**, SE2, AC2, HE1, **ST2**
Independency of values:	**Inside view/Experience**: missing	Tendency of choosing personal favoured values: **biased results**	**SD1**, **UN1**+3, SE
Graphic reproduction of value structure	**Formulation** of questions: ambivalent	Responses to items of one value vary: **different placement**	CO, **SD**, HE, **ST1**
Ranking of university values:	**Formulation** of questions: unclear/vague	Tendency of **choosing an intermediate category** based on uncertainty	PO2, CO1, **ST1** and **UN**

This reveals, in particular, the measurement of SD, UN and ST is less reliable respectively valid. Nonetheless SE, HE and CO are also worthy of improvement.

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7. Appendix

Table 2: Correlation of items measuring the same value (Pearsons r: PVQ vs. PVQ-U)

GOU-Entrants:	SD1, SD2	UN1, UN2	UN1, UN3	Un2, UN3	BE1, BE2	TR1, TR2	CO1, CO2	SE1, SE2	PO1, PO2	AC1, AC2	HE1, HE2	ST1, ST2
PVQ (n=102-105)	**-.023**	**.053**	**-.039**	.307**	.334**	**.136**	.331*	**.027**	**.150**	.304**	.410**	**.178**
PVQ-U (n=90-94)	.360**	.334**	.574**	.486**	.419**	**.241***	.475**	.519**	.377**	.494**	.486**	.334

**p<.01; *p<0,05,

Table A1: Testing Variance homogeneity – GOU vs. JKU, PVQ-U

Item	JKU, Entrants	JKU, Advanced	GOU, Entrants	GOU, Advanced
SD_1	71%	79%	72%	74%
SD_2	97%	97%	135%	106%
UN_2	68%	86%	66%	76%
UN_1	55%	60%	64%	100%
UN_3	121%	124%	69%	103%
BE_2	125%	88%	100%	110%
BE_1	88%	81%	67%	93%
TR_1	88%	120%	107%	82%
TR_2	112%	128%	132%	89%
CO_1	109%	99%	69%	83%
CO_2	122%	89%	68%	65%
SE_1	119%	98%	52%	53%
SE_2	155%	128%	58%	72%
PO_1	79%	127%	161%	97%
PO_2	88%	68%	122%	129%
AC_1	95%	79%	63%	65%
AC_2	93%	57%	50%	64%
HE_1	73%	113%	217%	189%
HE_2	116%	123%	217%	192%
ST_1	110%	125%	70%	119%
ST_2	113%	132%	143%	140%
M: v²	1.314	1.654	1.516	1.844

VI < 75%: Consent vs. **VI >125%:** Dissent

Table A4: Linear Regressions JKU-DATA, PVQ-U

		SD1	SD2	UN2	UN1	UN3	BE2	BE1	TR1	TR2	CO1	CO2	SE1	SE2	PO1	PO2	AC1	AC2	HE1	HE2	ST1	ST2
Entrants	R²	.396	.342	.472	.343	.410	.427	.383	.235	.232	.563	.626	.238	.531	.361	.394	.387	.342	.340	.434	.457	.356
	p	n.s.	n.s	.029	n.s	n.s	n.s	n.s	n.s	n.s	.002	.000	n.s	.006	n.s	n.s	n.s	n.s	n.s	n.s	.041	n.s.
Advanced	R²	.506	.425	.399	.416	.513	.462	.505	.463	.544	.386	.372	.395	.656	.426	.367	.416	.470	.548	.582	.337	.504
	p	n.s	n.s	n.s	n.s	n.s	n.s	n.s	n.s	n.s	n.s	n.s	n.s	.004	n.s	n.s	n.s	n.s	n.s	.027	n.s	n.s

Problematic Items: UN2, CO1+2, SE2, HE2, ST1

Table A2: Linear Regressions GOU-DATA, PVQ-U

		SD1	SD2	UN2	UN1	UN3	BE2	BE1	TR1	TR2	CO1	CO2	SE1	SE2	PO1	PO2	AC1	AC2	HE1	HE2	ST1	ST2
Entrants	R^2	.382	.265	.429	.355	.450	.399	.308	.240	.471	.383	.275	.414	.418	.356	.504	.487	.355	.373	.272	.353	.392
	p	.022	n.s	.004	.047	.003	.019	n.s	n.s	.001	.021	n.s	.007	.010	n.s	.000	.000	.n.s.	.036	n.s	n.s	.021
Advanced	R^2	.812	.621	.586	.818	.733	.622	.735	.509	.575	.619	.883	.796	.714	.521	.578	.656	.622	.503	.625	.615	.501
	p	.000	n.s	n.s	.000	.013	n.s	.008	n.s	n.s	n.s	.000	.001	.015	n.s	n.s	n.s	n.s	n.s	n.s	n.s	n.s

Table 4: Testing Hypothesis "priorities" – AT, PVQ-U

JKU				GOU			
Item	Entrants	Item	Advanced	Item	Entrants	Item	Advanced
UNu2_1	1.93	ACu2_2	2.04	UNu2_1	1.36	ACu2_1	1.48
UNu2_2	1.93	ACu2_1	2.18	SEu2_1	1.41	ACu2_2	1.49
SDu2_2	2.04	UNu2_1	2.2	ACu2_2	1.43	SEu2_1	1.50
BEu2_1	2.04	UNu2_2	2.30	COu2_1	1.43	SDu2_1	1.59
SDu2_1	2.1	SDu2_1	2.36	COu2_2	1.45	COu2_2	1.61
ACu2_2	2.45	SDu2_2	2.48	SDu2_1	1.48	COu2_1	1.65
HEu2_1	2.45	COu2_2	2.63	SEu2_2	1.48	SEu2_2	1.73
SEu2_1	2.49	BEu2_1	2.71	ACu2_1	1.50	TRu2_1	1.83
ACu2_1	2.55	POu2_2	2.75	BEu2_1	1.54	BEu2_1	1.86
UNu2_3	2.55	UNu2_3	2.80	UNu2_3	1.57	UNu2_3	1.88
BEu2_2	2.58	SEu2_1	2.84	UNu2_2	1.61	UNu2_1	1.90
POu2_2	2.66	BEu2_2	2.93	STu2_1	1.72	UNu2_2	1.92
COu2_2	2.69	STu2_1	3.00	BEu2_2	1.77	SDu2_2	2.00
STu2_1	2.89	SEu2_2	3.13	TRu2_1	1.83	TRu2_2	2.06
HEu2_2	2.89	COu2_1	3.13	SDu2_2	1.92	STu2_1	2.08
SEu2_2	2.90	HEu2_1	3.15	TRu2_2	1.95	BEu2_2	2.08
COu2_1	3.17	STu2_2	3.48	POu2_2	2.10	POu2_1	2.29
STu2_2	3.28	HEu2_2	3.49	STu2_2	2.38	STu2_2	2.38
TRu2_2	3.58	TRu2_2	3.75	POu2_1	2.59	POu2_2	2.42
TRu2_1	3.94	TRu2_1	4.05	HEu2_2	3.05	HEu2_2	2.96
POu2_1	5.13	POu2_1	4.44	HEu2_1	3.46	HEu2_1	3.46