

Students' Value Orientations in Contemporary China: Analysis of Measurement Invariance and Latent Mean Differences in Comparison With Students From Germany and Russia

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Abstract

The present study examined Chinese students' personal value orientations according to the Schwartz value theory in comparison with students from Germany and Russia. The theory postulates 10 value orientations grouped into four higher-order factors: conservation versus openness to change and self-transcendence versus self-enhancement. Schwartz' value orientations have been extensively investigated in Europe but less in East Asian countries such as China. We hypothesized that Chinese students would score higher on conservation and self-enhancement than German and Russian students, but lower on self-transcendence. Regarding openness to change, a null hypothesis was formulated. Students from China ($n = 9,601$), Germany ($n = 1,118$), and Russia ($n = 3,890$) completed the Portrait Values Questionnaire (PVQ-21). To ensure methodological preconditions for cross-cultural comparison, measurement invariance of the PVQ-21 was tested. In a first step, confirmatory Factor Analysis (CFA) was conducted separately for each country. Due to the high correlation between the 10 values, the four higher-order dimensions were studied separately. Configural, metric, and scalar invariance models were tested using multigroup CFA. Full metric and partial scalar invariance models held for all higher-order factors. Thereafter, latent means of values were compared across samples. As a result, Chinese students scored highest on the four higher-order dimensions when compared with Russian and German samples, thus the hypotheses were only partly confirmed. Results of this study could reflect the value conflicts emerging from various cultural influences in contemporary

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China: Young people are confronted with daily negotiation between Confucian tradition and the rapid economic development.

Keywords

value orientations, Portrait Values Questionnaire, cross-cultural comparison, measurement invariance, China

The study of value orientations attempts to describe differences and similarities across cultures and to capture societal change over time. The Schwartz value theory (Schwartz, 1992, 1994a, 2006) offers a sound theoretical framework for this purpose. Schwartz and Bilsky (1990) describe value orientations in terms of abstract, transsituational motivational goals which are related to people's attitudes (Boer & Fischer, 2013), behavior (Bardi & Schwartz, 2003), and even well-being (Sagiv & Schwartz, 2000). The most comprehensive data set on value orientations according to Schwartz' theory (in the following named "the Schwartz values") stems from the European Social Survey (ESS; Davidov, 2008, 2010; Davidov, Schmidt, & Schwartz, 2008), but evidence from other parts of the world such as China is still limited. This lack of evidence stands in large contrast with China's huge population and its economic and political importance in the global context.

The present study adds to current literature on cross-cultural comparability of Schwartz values by analyzing students' value orientations in China in comparison with students from Germany and Russia. Studying values in China is both interesting and challenging due to the complex interweavement of traditional and modern tendencies in the Chinese society. As highlighted below, China looks back on thousands of years of Confucian tradition, which gives high importance to values such as social harmony, face-keeping, and moral self-cultivation (Kulich & Zhang, 2010). On the other hand, China has witnessed drastic political, economic, and technological changes during the past century, with far-reaching consequences regarding peoples' values.

Hitherto, value research in China has primarily focused on *emic* (i.e., culturally specific) concepts of values (Kulich & Zhang, 2010). By contrast, *etic* (i.e., universal) value frameworks such as the Schwartz theory have been less investigated, and comparative studies are scarce. Significant challenges arise when a theory and its related methods are applied to a culture that differs entirely from the origins of the theory. The few studies which so far have drawn on the Schwartz theory in China focused on the relationship between values and other concepts, such as modesty (S. X. Chen, Bond, Chan, Tang, & Buchtel, 2009), beliefs about psychological problems (S. X. Chen & Bond, 2012), or mental health and well-being (Maercker et al., 2015; Maercker et al., 2009).

Before examining how values relate to a broad variety of dimensions of human functioning, reasoning, and behavior across cultures, it is vital to make sure that the methodological preconditions for applying the theoretical construct of values in cross-cultural research are met—that is, *measurement invariance* or *measurement equivalence*. Measurement invariance refers to "whether or not, under different conditions of observing and studying phenomena, measurement operations yield measures of the same attribute" (Horn & McArdle, 1992, p. 117). Testing measurement invariance thus contributes to ensure that the abstract concept of values can be measured comparably across countries.

The current study adds one important piece of evidence to the overarching question whether value orientations can be conceptualized in a universal theoretical framework that is also valid in China. Furthermore, by comparing students from China with students from two countries that are already included in the ESS, we aim to provide insights into how the broad, societal, and cultural context in China is reflected in students' individual value preferences. Based on this evidence,

previous findings on relationships between values and other concepts in China can be contextualized more precisely.

Theoretical Considerations: Personal and Cultural Values

Schwartz and Bilsky (1990) and Schwartz (1992, 1994a) originally proposed a circular structure of 10 personal value orientations: universalism; benevolence; tradition; conformity; security; power; achievement; hedonism; stimulation; and self-direction. The 10 values are allocated on two bipolar higher-order dimensions: conservation versus openness to change, and self-transcendence versus self-enhancement. The circular structure is based on the assumption that values are not distinct patterns but related to one another, either because they are in opposition (e.g., conformity and self-direction) or accord well with each other (e.g., power and achievement). Schwartz and Bilsky (1990) assumed this circular structure of values to be universal. In other words, they assumed that people or cultures differ with regard to the relative importance they give to values, but the structural relations among values remain invariant.

Over time, this theory has been further developed. Schwartz (1994b, 2006) introduced the important distinction between personal and cultural values. Further, Schwartz et al. (2012) presented a refined theory where the original 10 (personal) values were divided into 19, smaller entities. When comparing samples between countries, as in the present study, it is important to consider which theoretical approach is chosen. The present study focuses on the original set of 10 personal values,¹ but taking previous evidence on cultural values in China into consideration.

The distinction between personal and cultural values is important, but also complex. The 10 personal values describe a person's overarching motivations that remain relatively stable over time and across different situations in life. Intrapersonal motivational conflicts may arise when a person emphasizes two different values opposed to one another (e.g., benevolence and power). By contrast, culture-level dimensions reflect the shared values and beliefs in societies that have developed in the process of adapting to challenges emerging in the social and economic environment (Schwartz, 1994b). In current literature, such distinctions between personal and cultural values are not always explicit and based on theory, which in our view is a shortcoming. Schwartz (2014) makes a case for a clear distinction between these two levels and explains how they relate to one another.

According to Schwartz (2006), cultural values describe the macro-level context in societies at large. Empirically, cultural values are obtained by aggregating means of personal value orientations for each country. This way countries become the "cases" in data sets and variance within countries is leveled out (Schwartz, 2014). Correlation patterns of value orientations at the aggregated country level yield a set of seven values that differ from the 10 aforementioned individual-level value orientations. According to Schwartz (1994b), the seven cultural-level value orientations can be described in terms of three types of challenges societies deal with: (a) the relationship between the individual and the group, which is reflected in the value dimensions of *autonomy* versus *embeddedness*; (b) the organization of the social structure, which refers to *hierarchy* versus *egalitarianism*; and (c) the relationship between humans and their environment, which encompasses *mastery* (e.g., over natural resources) versus living in *harmony* (e.g., with nature). The seventh dimension stems from a distinction between *intellectual* and *emotional autonomy*. Hence, cultural values describe the shared, macro-level values in societies. Such macro-level values are transmitted to individuals through different institutions such as family, education, politics, or religion and shape personal value orientations (Schwartz, 2014). Therefore, when striving to understand Chinese students' personal value orientations, it is important to take into account existing evidence on this large, macro-level context in China.

The choice of the appropriate approach for cross-country comparison of value orientations depends on two factors. First, as countries are the units of analysis, a large number of countries

is needed for a meaningful sample size when studying *cultural* values. Second, and more important, the decision depends on the research question. *Personal* values are used whenever the primary focus lies on how value orientations relate to other constructs *at the individual level*, such as attitudes or behavior. For example in the ESS, the main focus of many publications was on how personal values relate to policy-relevant outcomes, such as support for immigration (Davidov, Meuleman, Billiet, & Schmidt, 2008) or life satisfaction (Sørtheix & Lönnqvist, 2014) across countries. Similarly, the primary aim of this study is to describe students' personal value preferences that potentially relate to other outcomes such as mental health and well-being (Maercker et al., 2015). This brings us to the methodological considerations regarding the measurement of values across cultures to investigate the complex relationships between values and other variables.

Methodological Considerations: Cross-Cultural Measurement of Personal Values

Schwartz et al. (2001) developed the Portrait Values Questionnaire (PVQ) to measure personal value orientations. The original PVQ includes 40 items, and a shorter version with 21 items was issued for the ESS. Moreover, in the course of revising the Schwartz value theory (Schwartz et al., 2012), new versions of the PVQ (PVQ-5X and PVQ-R) became available. As mentioned earlier, when questionnaires such as the different versions of the PVQ are applied across countries, it is vital to make sure that the expressed scores in the questionnaire reflect the true underlying value orientation (Fischer, 2013). This requirement of measurement invariance is one of the main subjects of the present article.

Three levels of measurement invariance are distinguished (Byrne, 2008; Davidov, Schmidt, & Schwartz, 2008). *Configural invariance* is given when similar latent constructs are valid in all countries or groups, that is, the same number of factors emerge, the items substantially load on the same factors, and the correlation patterns between factors are comparable across groups. *Metric invariance* refers to equivalent factor loadings of the indicators on the latent factors. Hence, item differences indicate differences regarding the underlying construct (Steenkamp & Baumgartner, 1998), which means that covariances and unstandardized regression coefficients can be meaningfully compared across countries. Third, *scalar invariance* is given when the item intercepts are constrained to be equal and the model is still equivalent across groups. Scalar invariance is a necessary condition for comparison of latent means because it allows the conclusion that mean differences at the item level result from actual differences in the means of the latent construct. Byrne, Shavelson, and Muthén (1989) showed that noninvariant items do not substantially affect comparisons across groups as long as a part of the items of the model are invariant. The so-called *partial metric measurement invariance* is attained by at least two indicators with equal factor loadings, whereas *partial scalar measurement invariance* is given by two indicators with equal factor loadings and intercepts per construct across groups.

The PVQ-21 (Schwartz et al., 2001) is included in the ESS since 2002, and measurement invariance across European samples was tested in all rounds of the ESS ever since (Cieciuch & Davidov, 2012; Davidov, 2008, 2010; Davidov, Schmidt, & Schwartz, 2008). In the first round, the originally proposed 10-factor structure could not be fully empirically validated; three pairs of (adjacent) values correlated highly and were therefore unified, resulting in a seven-factor model (Davidov, Schmidt, & Schwartz, 2008). This seven-factor model showed metric but not scalar invariance. The same analysis was repeated with data from the second ESS round (Davidov, 2008). Eleven out of 25 countries were excluded from the study due to high correlations of at least one additional pair of values. Measurement invariance was tested across the remaining 14 countries. Again, the analysis provided evidence for configural and metric invariance, but not for scalar invariance. This result was replicated in the third round, where 17 countries were excluded

and metric invariance was found for the remaining eight countries (Davidov, 2010). To the best of our knowledge, measurement invariance of the PVQ-21 has not been tested in non-European countries.

The first aim of the present study was to test the measurement invariance of the PVQ-21 across student samples from China, Germany, and Russia. Based on the assumption that the Schwartz value theory is indeed universal, and that the PVQ-21 provides a valid instrument that captures the 10 value dimensions as conceptualized by Schwartz et al. (2001), we expected that the 10 personal values can be measured in China equal to Germany and Russia. Both Germany and Russia are included in the ESS and are therefore considered as reference. Considering the fact that previous studies of the ESS rejected the hypothesis of full scalar invariance of the PVQ-21 (Davidov, 2008, 2010; Davidov, Schmidt, & Schwartz, 2008), we did not expect full scalar invariance in our study. Hence, the methodological hypothesis of this study—a precondition for the following substantial hypotheses—is formulated as follows:

Methodological Hypothesis: Partial scalar invariance of the PVQ-21 will be found across three student samples from China, Germany, and Russia.

Substantial Considerations: Chinese Values Evolving Over Time

As aforementioned, evidence for the Schwartz value theory from China is scarce. To the best of our knowledge, no comparative studies exist with regard to personal values but only regarding cultural values (Schwartz, 1994b). Moreover, several attempts have been made to match the Schwartz values with *emic* (i.e., culturally specific) values in China (e.g., Bond & Chi, 1997; Yu, Fu, Liu, & Qu, 2007). Emic values as well as Schwartz cultural and personal values in China can only be understood when taking into account the historic background. In China, values, on the one hand, have evolved as a result of ancient philosophical reasoning and Confucian tradition. On the other hand, more recently, political changes, global trade, and economic development have impacted people's values (Kulich & Zhang, 2010). In the following, we shortly outline this historical development and discuss Schwartz' (1994b) findings on cultural values. Against this background, we formulate our hypotheses with regard to Chinese students' personal values compared with German and Russian students. The four hypotheses and the related historic background are structured along the four higher-order dimensions of personal values (conservation vs. openness to change and self-transcendence vs. self-enhancement).

Conservation

Zhai (1999, 2008) and Zhai and Qu (2001) describe historical shifts in Chinese value orientations during the past centuries. From Spring and Autumn period (approximately 771 B.C.), different schools of ancient philosophers greatly influenced Chinese values, among which Confucius was undoubtedly the most influential. In Confucian tradition, moral self-cultivation along the “five virtues” of benevolence, justice, courtesy, wisdom, and faith (called “Wuchang”) is emphasized (Guan, 2012). Moreover, hierarchically defined social structure and social harmony were highly valued. Important emic Chinese values rooted in Confucian tradition are *mianzi* (face-keeping, Hwang, 2011) and *guanxi* (social relations, Ma, 2011), both of which serve the higher value of *he xie* (harmony, G.-M. Chen, 2011). *Xiao* (filial piety), which refers to respect for one's parents, elders, and ancestors, is highly valued as well (Kulich & Zhang, 2010).

This cultural background is reflected in Schwartz' (1994b) findings on *cultural values*. In his study, China scored highest on *hierarchy* and *embeddedness* in comparison with the rest of the world. Schwartz (2006) interpreted this result in terms of the Confucian tradition: Hierarchy relates to the social structure and acceptance of unequal power distribution, and embeddedness

to the importance of social relations, family, and harmony. Thus in Schwartz' (1994b) study, ancient Confucian heritage was reflected in the aggregated importance given to these cultural values by the Chinese.

As explained in the theoretical section, cultural values are transmitted to individuals through different institutions and are expected to be reflected in personal values. Some evidence exists for this assumption regarding Confucian values. For example, Zhai and Qu (2001) found in a survey study on emic cultural values that *guanxi* (interpersonal relations) and *mianzi* (face) remained the core value orientations in present Chinese society. Moreover, Chinese traditional values such as Confucian values are included in the two questionnaires assessing emic value orientations in China, the Chinese Value Instrument (CVI; Yu et al., 2007), and the Chinese Values Questionnaire (CVQ; Jin, Zheng, & Xin, 2009). Empirical evidence from these surveys showed that these values are still very prevalent in China (Jin et al., 2009).

The higher-order factor of conservation comprises tradition, security, and conformity, all of which are closely related to both the Confucian tradition and the Schwartz cultural values of hierarchy and embeddedness. For this reason, we expect conservation to be highly valued by Chinese students.

Substantial Hypothesis 1: Chinese students score higher on conservation than German and Russian students.

Openness to Change

In the past century, China witnessed far-reaching political, economic, and technological changes (Zhai, 1999, 2008; Zhai & Qu, 2001). In 1912, the founding of the Republic of China put an end to the last imperial dynasty (Qing) that had reigned since 1644. After 1912, the new cultural movement began to promote Western values in China, particularly in terms of scientific and democratic perspectives. An era of *cultural orientation* followed (Zhai, 1999), where China found itself between Chinese traditional values versus Western values, between tradition and modernization. In 1949, the Maoists proclaimed the People's Republic of China, which was the starting signal for an era of *political orientation* (Zhai, 1999). Politics and class struggle reached into society, economy, culture, education, and people's daily lives. In 1966, the Mao regime launched the Cultural Revolution, where political prosecution and social unrest became daily fare. Finally, in 1978 (the Chinese economic reform), the era of *economic orientation* began, where materialism and the pursuit of wealth became increasingly important. These fast and profound changes in the political and economic environment over the past decades led to shifts in people's personal values. However, such value shifts occur slowly (Fischer, 2013) and not necessarily linearly. During societal change, people reevaluate and clarify their values, which can lead to ambivalence (Kulich & Zhang, 2010). Zhai and Qu (2001) found in a survey study on emic values in China that many respondents did not have a clear idea about their values.

The ambivalence between traditional Chinese and Western values is most pronounced in younger generations. According to Feng (1996), before the Cultural Revolution young people were judged by how much they had contributed to the society and the country. In the early stage of the Cultural Revolution, political standards were strongly emphasized, and personal interests and values rejected. Later during the Cultural Revolution, due to increasingly poor living conditions and cruel political interventions, young people began to lose confidence and felt increasingly confused about what they had pursued and believed. After the death of Mao in 1976 and with the increasing economic orientation, individual values, such as self-direction, personal achievement, and happiness, became more important (Guo, 2008). Meanwhile, the youth are massively influenced by globalization, information technologies, and the Internet, which has led to a major shift in values. Guo (2008) describes the values of young people as pluralistic and

contradictory (e.g., collective vs. personal interests, idealism vs. pragmatism, Chinese traditional moral vs. Western values).

It is important to keep this historic development in mind when studying openness to change at the personal level, which consists of self-direction and stimulation. In Schwartz' (1994b) study on cultural values, China scored high on *intellectual autonomy* but lowest on *affective autonomy* in cross-cultural comparison. This is an interesting finding. According to Schwartz (2006), intellectual autonomy refers to individuals pursuing their own ideas and intellectual directions, whereas affective autonomy encourages individuals to pursue affectively positive experience for themselves. The fact that China scored high on one and lowest on the other aspect of autonomy in cross-country comparison might be an indicator for the nonlinear process of value change and the ongoing tension between (Confucian) tradition and increasing Western influence (Kulich & Zhang, 2010).

Against this background, the substantial hypothesis with regard to openness to change has to be formulated with care. At the individual level, evidence suggests that young people in China increasingly pursue stimulation and self-direction (Guo, 2008). Additionally, both stimulation and self-direction show relatively small variation in cross-country comparison (Fischer & Schwartz, 2011). Taken together, we chose to test a null hypothesis with regard to openness to change:

Substantial Hypothesis 2: No significant mean differences are found regarding openness to change when comparing Chinese with German and Russian students.

Self-Transcendence

The historic context described above is most possibly also reflected in self-transcendence, which consists of benevolence and universalism. As aforementioned, benevolence is one of the five virtues within the Confucian tradition (Guan, 2012). However, benevolence is among the values with lowest cross-country variance, as most people worldwide tend to agree that caring for those close to you is important (Fischer & Schwartz, 2011). More cross-cultural variation exists regarding universalism, which refers to protection of the environment and egalitarian rights within society.

When looking at environmental concerns in China, the Mao era seems to be particularly relevant. Mao was convinced that human freedom was only possible through understanding, overcoming, and changing the nature (Ho, 2003). Shapiro and Crosby (2001) describe how political coercion and environmental degradation went hand in hand under Mao's regime, with massive deforestation and desertification efforts during that time. In the post-Mao era, the exploitation of natural resources continued, sparked by the rapid economic development and strive for profit.

Regarding egalitarianism, Chinese history is more than complex. Confucian tradition was characterized by a clearly defined hierarchical social structure. Democratic values gained importance at the beginning of the 20th century (Zhai, 1999), but the Maoist era soon followed. Social equality was the primary goal in this era, and a relatively egalitarian social order was established. But at the same time, inequality increased across the rural–urban divide as well as within the bureaucratic system (Whyte, 2012). After Mao's death, China's reforms and economic growth continued to increase social inequality. Mao's egalitarianism was rejected because it was seen to eliminate incentives (Whyte, 2012).

When looking at cultural values, Schwartz (1994b) found a strong emphasis on *hierarchy* and *mastery* with a rejection of *egalitarianism* and *harmony* in China compared with other regions. The outlined historical background might explain these findings and also be reflected in personal values: In the 1990s, economic growth and the rejection of egalitarianism was propagated in China, and people were still under the impression of the extreme consequences of Mao's

propagated socialist philosophy. Based on these considerations, we formulated the third substantial hypothesis as follows:

Substantial Hypothesis 3: Chinese students score lower on self-transcendence than German and Russian students.

Self-Enhancement

This higher-order dimension consists of power and achievement. Again, when looking at self-enhancement, different aspects of Chinese history have to be taken into account. Inglehart (1990) states that “the Confucian system was virtually unique among traditional cultures in that it institutionalized a socially accepted and even honored channel for upward social mobility” (p. 61), and this channel was education. Social upward mobility was possible by studying hard to pass a series of difficult academic examinations, thereby gaining power, status, and wealth. Thus, self-enhancement is deeply engrained in the Confucian tradition. Self-enhancement values contradicted the socialist politics during the era of Mao. But in the post-Mao era, and with increasing economic development, power and achievement gained in importance. As described above, “getting rich” was propagated to stimulate economic growth. Self-enhancement also became more important among the youth (Guo, 2008). Since 1999, the University and College Enrolment Expansion Plan has provided access to higher education for the majority of young people.

At the cultural level, China scored highest worldwide on *hierarchy* in Schwartz’ (1994b) study. Hierarchy includes value orientations such as wealth, social power, being successful, and ambitious; value orientations that at the individual level subsume under self-enhancement. At the personal level, some evidence exists regarding the importance of self-enhancement in contemporary China. Studies on personal value orientations consistently show that educational achievement to attain social prestige is highly valued (Guo, 2008; Jin et al., 2009). With regard to power, one study found that Chinese people gave lowest importance to this value when compared with other emic value concepts, such as social relations and harmony (Jin et al., 2009). But Huang, Dou, and Zheng (2008) found that the personal value orientations of wealth and power were more salient in young people in China than among elder generations. And in a survey among 2,650 college students asking to rank values according to their importance, the value orientations with highest rankings were professional achievement, self-accomplishment, fame and social position, and wealth (Xin & Jin, 2005). Taken together, we formulated the fourth substantial hypothesis as follows:

Substantial Hypothesis 4: Chinese students score higher on self-enhancement than German and Russian students.

Method

Procedure and Samples

Data for this study were taken from the Bochum Optimism and Mental health (BOOM) research program. This cross-cultural, longitudinal study aims to identify predictors of mental health and well-being. Our study included samples of college students from four universities in China (Capital Normal University, North China University of Science and Technology, Nanjing University, and Shanghai Normal University), three universities in Russia (Lomonossov University Moscow, University of Voronezh, University of Orenburg), and one in Germany (Ruhr-Universität Bochum).

Collaborating Departments of Psychology in each country collected the data. Questionnaires were administered in the respective native language of each country. The Ethics Committee of the Faculty of Psychology at Ruhr-Universität Bochum approved the BOOM study in general. In China and Russia, data were anonymized from the beginning, thus an additional statement by a local institutional board or Ethics Committee was not required. Participating Chinese and Russian universities were informed about the decision of the German Ethics Committee and acknowledged the approvals. In China and Russia, university students below age 18 were included. In both countries, local laws grant officially enrolled university students of all ages the right to make decisions about study-related issues, including participation in studies.

In the five Chinese sites, of the $n = 10,652$ students, 59% participated in group-online sessions supervised by research investigators and 41% participated in paper-and-pencil testing. In Germany, the questionnaires were administered through an online portal. Data from this online investigation were available for $n = 1,529$ persons. In Russia, data were gathered with paper-and-pencil questionnaires at the three collaborating universities, including $n = 4,001$ students. The different assessment modes covary with the groups based on countries and could lead to confounding results. However, previous research from organizational psychology has shown that assessment across different administration modes are equivalent (Cole, Bedeian, & Feild, 2006; De Beuckelaer & Lievens, 2009). These findings have been replicated for the PVQ-21 (Ciecich, Davidov, Oberski, & Algesheimer, 2015; Davidov & Depner, 2011).

After data cleaning (see below), 9,601 cases could be used in China (64% female; age: $M = 19.9$, $SD = 1.9$); 1,118 cases were included in Germany (60.3% female; age: $M = 25.2$, $SD = 3.7$); and 3,890 cases remained in Russia (64.8% female; age: $M = 19.8$, $SD = 2.3$). Age mean was higher in Germany ($F = 3,086.2$, $p < .001$) because all students were asked to participate, whereas in Russia and China, primarily first semester students were included. In all countries, international students were included in the sample; however, their proportion was very small compared with the rest of the sample (China: .001%; Germany: 10.5%; Russia: 3.5%).²

Measures

PVQ-21. This questionnaire provides 21 portraits of persons consisting of two sentences. Respondents rate how similar they feel they are to the portrayed person on a 6-point scale from 1 = *very similar* to 6 = *very dissimilar*. For example, “She thinks it is important that every person in the world be treated equally. She wants justice for everybody, even for people she doesn’t know” (universalism). For each of the 10 values, two items are presented, with the exception of universalism, which consists of three items (please see Appendix for an overview of the questionnaire). Published versions were available for Germany (Schmidt, Bamberg, Davidov, Herrmann, & Schwartz, 2007) and China (Maercker et al., 2009). In Russia, the customary translation-back translation method was applied (Brislin, 1970; Wild et al., 2005). Only afterward we realized that the PVQ-21 (Schwartz, 2003; Schwartz et al., 2001) had already been translated into Russian for the ESS. However, contrasting the two versions yielded high comparability. All translated questionnaires are available from the authors upon request.

Data Cleaning and Analysis

We cleaned data according to the procedure described in Bilsky, Janik, and Schwartz (2011): Persons with more than five missing responses and those who gave the same answer to more than 16 items were excluded. Sample sizes for each country before and after data cleaning and data processing were described above. All three samples had less than 5% missing values after data cleaning; missings are assumed to be randomly distributed and can thus be neglected in the analysis. To test for configural, metric, and scalar invariance of the PVQ-21 in our sample, we

used the simultaneous factor analysis framework (Jöreskog, 1971). We first calculated single-group Confirmatory Factor Analyses (CFAs) for each sample and then ran Multi-Group CFA (MGCFA) simultaneously for the three cultural groups. Where full scalar invariance was not attained, we additionally tested for partial scalar invariance (Byrne et al., 1989). CFA and MGCFA were conducted using the R package lavaan (Rosseel, 2012). We used “robust maximum likelihood estimation” (MLR) with its default settings for standard errors and test statistics. Missing values were treated with full information maximum likelihood estimation. Model fit was evaluated using the conventional χ^2 test. However, χ^2 test has been criticized due to its known sensitivity to sample size and its underlying assumption of perfect model fit (Milfont & Fischer, 2010) and should not be used as the only test statistic (Jöreskog, 1993). For this reason, we additionally used established fit indices (F. F. Chen, 2007; Cheung & Rensvold, 2002). When comparing configural, metric, and scalar invariance models, we applied the criterion of change in comparative fit index (ΔCFI) = .01 (F. F. Chen, 2007). Finally, we compared latent factor means whenever at least partial scalar invariance could be accepted. In a first step, a model assuming that all latent factor means are equal was tested, additionally constraining latent factor means across all samples. As a second step, post-hoc comparisons were conducted whenever latent factor means were not equal across all samples. To calculate the mean differences, one sample’s mean was constrained to 0 and the other means were estimated freely. For the latent means, we used *z*-standardized estimates. Hedge’s *g* was calculated as effect size measure to respect the different sample sizes (Hedges, 1981).

Results

According to standard procedures for measurement invariance testing (Byrne, 2008; Vandenberg & Lance, 2000), we first conducted three single-group CFAs, one for each cultural group, using the 10-factor structure proposed by Schwartz et al. (2001). As found in previous studies (Cieciuch & Davidov, 2012; Davidov, 2008; Davidov, Schmidt, & Schwartz, 2008), high covariance between adjacent values occurred in all cultural groups. We proceeded as proposed by Davidov, Schmidt, and Schwartz (2008), but neither their seven-factor structure nor the four higher-order factor model could be replicated due to high covariances between factors and numerous cross-loadings. Therefore, we applied the “magnifying glass strategy” proposed by Cieciuch and Schwartz (2012). That is, we tested the four higher-order factors in separate models for each sample. According to the Schwartz model, hedonism is placed between the higher-order factors openness to change and self-enhancement and was therefore excluded from further analyses.

The four higher-order factors provided satisfying model fits in each sample after allowing for several error correlations between items that were originally conceptualized as comprising one single factor. In the conservation factor, one security item (*It is important to him/her that the government ensures his/her safety against all threats. He/she wants the state to be strong so it can defend its citizens.*) was excluded due to high error correlations and covariance with other indicator items for this factor. Goodness-of-fit-indices of the single-group CFAs are displayed in Table 1 for each cultural group and the underlying baseline models are illustrated in Figure 1. Descriptive properties and factor loadings are displayed in Table 2.

In the next step, we ran MGCFA to test configural, metric, and scalar invariance. As implied by the goodness-of-fit indices displayed in Table 3, we accepted the configural model for all four higher-order factors. Self-transcendence, conservation, and self-enhancement also met the criteria for full metric invariance. The factor loading of one self-direction item (*Thinking up new ideas and being creative is important to him. He likes to do things in his own original way.*) had to be released to accept partial metric invariance for the openness to change factor.

None of the latent factors met the criteria for full scalar invariance, as ΔCFI exceeded the established cutoff of 0.01 (F. F. Chen, 2007). Hence, we tested for partial scalar invariance (Byrne

Table 1. Chi-Square and Goodness-of-Fit-Indices for Single-Group Confirmatory Factor Analysis for Each Latent Factor.

	Germany			China			Russia		
	χ^2 (df)	CFI	RMSEA	χ^2 (df)	CFI	RMSEA	χ^2 (df)	CFI	RMSEA
Self-transcendence	6.25 (3)***	0.994	0.031	55.83 (3)***	0.992	0.043	17.04 (3)***	0.992	0.035
Conservation	6.83 (3)	0.993	0.034	15.33 (3)**	0.996	0.021	12.47 (3)**	0.995	0.028
Self-enhancement	12.80 (1)***	0.985	0.103	7.70 (1)***	0.998	0.026	7.74 (1)***	0.997	0.042
Openness to change	0.08 (1)	1.000	0.000	2.63 (1)	1.000	0.013	1.88 (1)	0.999	0.015

Note. CFI = comparative fit index; RMSEA = root mean square error approximation.

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$; Hedonism (pvq10, pvq21) and one security item (pvq14) were excluded from the analysis.

et al., 1989). For this aim, we successively released those intercepts that were indicated to be noninvariant according to the modification indices provided by the lavaan package. After this procedure, partial scalar invariance models could again be accepted for all latent factors. The final partial scalar invariance models contained two constrained intercepts per higher-order factor: Two universalism items for self-transcendence (Item 3 and Item 8), two conformity items for conservation (Item 7 and Item 16), one achievement and one power item for self-enhancement (Item 13 and Item 17, respectively), and both stimulation items for openness to change (Item 6 and Item 15). Only for openness to change, when comparing the partial scalar to the partial metric invariance model, Δ CFI exceeded the established cutoff of .01 by .004, indicating a marginal deterioration of model fit. Yet, Byrne and Stewart (2006) accepted a drop in Δ CFI of .015 because it almost met the Δ CFI \leq .01 criterion. Thus, we continued our analysis with the partial scalar invariance model for openness to change, but results must be interpreted with caution. Therefore, the minimal requirement for latent mean comparisons was fulfilled for all higher-order factors (Byrne et al., 1989).

Latent factor mean comparisons across all samples indicated mean differences for all latent factors. Thus, paired group comparisons were conducted post-hoc. Figure 2 graphically displays mean differences across the three samples. According to the PVQ-21 response scale, higher values represent lower emphasis on a particular value. The figure shows the z-standardized latent mean differences calculated by paired-sample comparisons. In the upper part of each graph, the latent mean of the Chinese sample was fixed to 0 and compared with Russia and Germany whereas in the lower part of each graph, the latent mean of the German sample was fixed to 0 and the latent mean of the Russian sample was estimated freely. Effect size is reported as Hedges' g .

For self-transcendence, the Russian sample scored meaningfully lower than German ($z = -21.07$; $p = .000$; $g = .368$) and Chinese samples ($z = -28.78$; $p = .000$; $g = .562$), whereas the difference between German and Chinese students was statistically nonsignificant ($z = 2.10$; $p = .035$; $g = .060$). Chinese students reported the highest level of conservation compared with German ($z = -27.77$; $p = .000$; $g = 1.110$) and Russian students ($z = -21.46$; $p = .000$; $g = .429$), and the Russian sample displayed the second highest levels in comparison with the German sample ($z = 15.54$; $p = .000$; $g = .278$). In regard to self-enhancement, again Chinese students stated the highest levels followed by German ($z = -8.69$; $p = .000$; $g = .195$) and Russian students ($z = -19.56$; $p = .000$; $g = .328$), the lowest results were found in Russia also compared with Germany ($z = -6.25$; $p = .000$; $g = .107$). Finally, latent mean comparisons of the openness to change factor yielded to a similar pattern: Chinese students scored highest compared with Russian ($z = -8.41$; $p = .000$; $g = .170$) and German students ($z = -15.62$; $p = .000$; $g = .557$), and German students scored meaningfully lower than Russian students ($z = -9.87$; $p = .000$; $g = .178$). Due to questionable scalar measurement invariance, this result has to be treated with caution.

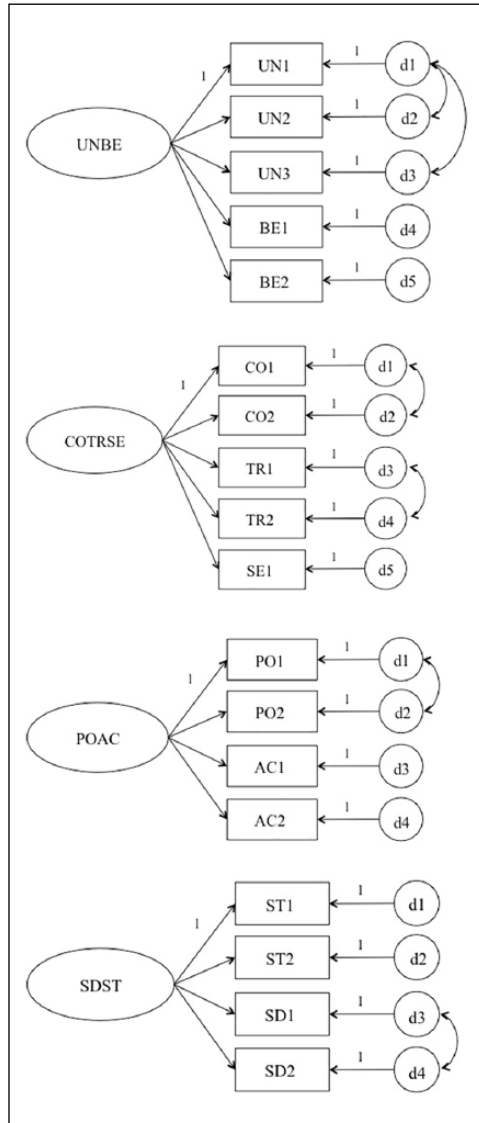


Figure 1. Basic models for each latent factor.

Note. UNBE = self-transcendence; UN = universalism; BE = benevolence; COTRSE = conservation; CO = conformism; TR = tradition; SE = security; POAC = self-enhancement; PO = power; AC = achievement; STSD = openness to change; SD = self-direction; ST = stimulation.

Discussion

This study tested measurement invariance of the PVQ (Schwartz et al., 2001) across student samples in China, Germany, and Russia. Partial scalar invariance was attained for all latent factors, which means that the methodological hypothesis of this study was confirmed, and latent means of values could be compared thereafter. Chinese students scored highest on the four higher-order value dimensions (conservation, openness to change, self-transcendence, and self-enhancement) when compared with German and Russian students. Therefore, the substantial hypotheses could only partly be confirmed, which is further discussed below.

Table 2. Descriptive Properties (Mean, Standard Deviation Skew, Kurtosis, Cronbach's Alpha, Factor Loadings) for All Items by Country.

	Germany				China				Russia				Germany				China				Russia														
	M	SD	Skew	Kurt	α	M	SD	Skew	Kurt	α	M	SD	Skew	Kurt	α	M	SD	Skew	Kurt	α	M	SD	Skew	Kurt	α	M	SD	Skew	Kurt	α	Item				
Self-transcendence					.67					.76					.65					.76					.65					.65					.65
UNI	2.11	1.1	1.05	0.89		2.11	1.16	1.1	0.76		2.83	1.41	0.44	-0.7		2.83	1.41	0.44	-0.7		2.83	1.41	0.44	-0.7		2.83	1.41	0.44	-0.7		.49	.47	.35	pvq3	
UN2	2.19	1.06	0.87	0.59		2.3	1.11	0.76	0.13		2.86	1.28	0.37	-0.56		2.86	1.28	0.37	-0.56		2.86	1.28	0.37	-0.56		2.86	1.28	0.37	-0.56		.57	.51	.43	pvq8	
UN3	2.37	1.24	0.8	0.14		1.91	0.98	1.02	0.71		2.64	1.29	0.48	-0.51		2.64	1.29	0.48	-0.51		2.64	1.29	0.48	-0.51		2.64	1.29	0.48	-0.51		.33	.66	.49	pvq19	
BE1	2.14	1	0.96	1.26		2.14	1.03	0.79	0.29		2.67	1.17	0.37	-0.34		2.67	1.17	0.37	-0.34		2.67	1.17	0.37	-0.34		2.67	1.17	0.37	-0.34		.70	.72	.68	pvq12	
BE2	1.61	0.77	1.53	3.74		1.8	0.9	1.15	1.32		2.08	1.08	0.99	0.75		2.08	1.08	0.99	0.75		2.08	1.08	0.99	0.75		2.08	1.08	0.99	0.75		.54	.73	.65	pvq18	
Conservation					.62					.60					.65					.60					.65					.65					.65
CO1	3.87	1.37	-0.15	-0.83		2.61	1.27	0.6	-0.38		3.13	1.45	0.2	-0.96		3.13	1.45	0.2	-0.96		3.13	1.45	0.2	-0.96		3.13	1.45	0.2	-0.96		.55	.54	.58	pvq7	
CO2	3.11	1.33	0.32	-0.58		2.21	1.13	0.9	0.36		2.61	1.29	0.56	-0.42		2.61	1.29	0.56	-0.42		2.61	1.29	0.56	-0.42		2.61	1.29	0.56	-0.42		.66	.58	.54	pvq16	
TRI	2.87	1.29	0.35	-0.57		2.74	1.31	0.43	-0.67		3.28	1.38	0.04	-0.84		3.28	1.38	0.04	-0.84		3.28	1.38	0.04	-0.84		3.28	1.38	0.04	-0.84		.47	.46	.56	pvq9	
TR2	3.64	1.5	-0.01	-1.05		3.09	1.37	0.17	-0.84		3.27	1.48	0.14	-0.94		3.27	1.48	0.14	-0.94		3.27	1.48	0.14	-0.94		3.27	1.48	0.14	-0.94		.35	.45	.47	pvq20	
SE1	2.71	1.16	0.48	-0.16		3.06	1.36	0.19	-0.9		3.41	1.41	-0.04	-0.88		3.41	1.41	-0.04	-0.88		3.41	1.41	-0.04	-0.88		3.41	1.41	-0.04	-0.88		.50	.41	.48	pvq5	
Self-enhancement					.73					.65					.73					.65					.73					.73					.73
PO1	3.85	1.34	-0.13	-0.79		3.7	1.32	-0.2	-0.74		3.54	1.35	-0.12	-0.68		3.54	1.35	-0.12	-0.68		3.54	1.35	-0.12	-0.68		3.54	1.35	-0.12	-0.68		.53	.38	.49	pvq2	
PO2	3.13	1.14	0.33	-0.15		2.85	1.27	0.32	-0.62		3.37	1.4	0	-0.88		3.37	1.4	0	-0.88		3.37	1.4	0	-0.88		3.37	1.4	0	-0.88		.49	.48	.58	pvq17	
AC1	2.71	1.2	0.56	-0.14		2.62	1.23	0.48	-0.48		3.42	1.37	-0.06	-0.82		3.42	1.37	-0.06	-0.82		3.42	1.37	-0.06	-0.82		3.42	1.37	-0.06	-0.82		.67	.59	.67	pvq4	
AC2	2.57	1.16	0.58	-0.1		2.28	1.12	0.76	0.14		2.79	1.3	0.31	-0.71		2.79	1.3	0.31	-0.71		2.79	1.3	0.31	-0.71		2.79	1.3	0.31	-0.71		.86	.81	.80	pvq13	
Openness to change					.67					.71					.60					.71					.60					.60					.60
SD1	2.86	1.32	0.38	-0.58		3.15	1.27	0.01	-0.75		3.04	1.43	0.18	-0.83		3.04	1.43	0.18	-0.83		3.04	1.43	0.18	-0.83		3.04	1.43	0.18	-0.83		.38	.55	.60	pvq1	
SD2	1.94	0.93	0.81	0.26		2.45	1.21	0.62	-0.3		2.63	1.26	0.46	-0.49		2.63	1.26	0.46	-0.49		2.63	1.26	0.46	-0.49		2.63	1.26	0.46	-0.49		.38	.44	.35	pvq11	
ST1	3.07	1.28	0.25	-0.57		2.59	1.23	0.46	-0.57		2.88	1.33	0.19	-0.84		2.88	1.33	0.19	-0.84		2.88	1.33	0.19	-0.84		2.88	1.33	0.19	-0.84		.08	.76	.63	pvq6	
ST2	3.75	1.29	-0.12	-0.56		3.08	1.44	0.15	-0.98		3.12	1.49	0.13	-1.02		3.12	1.49	0.13	-1.02		3.12	1.49	0.13	-1.02		3.12	1.49	0.13	-1.02		.73	.70	.49	pvq15	
Hedonism					.76					.63					.62					.63					.62					.62					.62
HE1	2.29	1.11	0.88	0.6		2.35	1.2	0.74	-0.07		2.53	1.26	0.51	-0.55		2.53	1.26	0.51	-0.55		2.53	1.26	0.51	-0.55		2.53	1.26	0.51	-0.55					pvq10	
HE2	2.95	1.22	0.45	-0.17		2.17	1.15	0.87	0.2		2.91	1.35	0.31	-0.66		2.91	1.35	0.31	-0.66		2.91	1.35	0.31	-0.66		2.91	1.35	0.31	-0.66					pvq21	
Security (excluded)																																			
SE2	3.19	1.33	0.31	-0.56		2.28	1.22	0.85	0.09		3.24	1.51	0.14	-0.99		3.24	1.51	0.14	-0.99		3.24	1.51	0.14	-0.99		3.24	1.51	0.14	-0.99					pvq14	

Note. UN = universalism; BE = benevolence; CO = conformism; TR = tradition; SE = security; PO = power; AC = achievement; SD = self-direction; ST = stimulation. * $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$. Factor loadings are standardized.

Table 3. Chi-Square and Goodness-of-Fit-Indices for Multi-Group Confirmatory Factor Analysis Across Countries.

	χ^2 (df)	CFI	RMSEA (90% CI)	SRMR	χ^2 (Δdf)	ΔCFI
Self-transcendence						
Configural	82.597 (9)***	.992	.041 [.034, .048]	.012		
Metric	132.520 (17)***	.988	.037 [.032, .043]	.017	48.489 (8)***	.004
Scalar	719.233 (25)	.927	.076 [.071, .080]	.044	682.75 (8)***	.061
Partial scalar (τ_{12} , τ_{18} , τ_{19})	162.285 (19)***	.985	.039 [.035, .044]	.020	33.738 (2)***	.003
Latent means constrained to be equal ^a	9,573.288 (30)***	.901	.096 [.092, .101]	.073	969 (3)***	.084
Conservation						
Configural	34.946 (9)***	.995	.024 [.017, .032]	.009		
Metric	57.784 (17)***	.993	.022 [.017, .028]	.012	22.599 (8)***	.002
Scalar	992.084 (25)***	.825	.089 [.085, .094]	.041	1089.9 (8)***	.168
Partial scalar (τ_5 , τ_9 , τ_{20})	83.477 (19)***	.988	.026 [.021, .032]	.014	27.639 (2)***	.005
Latent means constrained to be equal ^a	1,060.969 (21)***	.812	.101 [.096, .106]	.075	1661.4 (2)***	.176
Self-enhancement						
Configural	28.571 (3)***	.996	.042 [.030, .055]	.007		
Metric	65.747 (9)***	.992	.036 [.029, .044]	.014	36.01 (6)***	.004
Scalar	800.234 (15)***	.892	.104 [.098, .110]	.052	800.86 (6)***	.100
Partial scalar (τ_2 , τ_4)	102.948 (11)***	.987	.041 [.035, .048]	.018	40.312 (2)***	.005
Latent means constrained to be equal ^a	645.030 (13)***	.913	.100 [.094, .106]	.073	715.96 (2)***	.074
Openness to change						
Configural	4.703 (3)***	1.000	.011 [.000, .027]	.003		
Metric	122.314 (9)***	.985	.051 [.043, .059]	.023	121.11 (6)***	.015
Partial metric (λ_i)	45.772(7)***	.995	.034 [.025, .043]	.014	42.386 (4)***	.005
Partial scalar (λ_i , τ_i)	740.420 (11)***	.903	.117 [.110, .124]	.046	718 (4)***	.092
Partial scalar (λ_i , τ_i , τ_{11})	151.545 (9)***	.981	.057 [.050, .065]	.020	116.14 (2)***	.014
Latent means constrained to be equal ^a	7,523.651 (18)***	.946	.087 [.080, .094]	.047	301.78 (2)***	.035

Note. CFI = comparative fit index; SRMR = Standardized Root Mean Square Residual; RMSEA = root mean square error approximation; CI = confidence interval.

^aLatent means were constrained based on the respective partial scalar invariance model.

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$; Released loadings and intercepts are reported in brackets for the partial models.

Testing whether personal value orientations according to Schwartz' theory can be equally measured across cultures, and particularly in contexts which contrast Western cultures, is essential. So far, measurement invariance of the PVQ-21 has only been tested across European countries. Our results indicate that at least when using student samples, the PVQ-21 seems to be a valuable instrument for capturing personal value orientations in China. Consistent with previous studies from the ESS (Davidov, 2008, 2010; Davidov, Schmidt, & Schwartz, 2008), we could not confirm the original 10-factor structure, neither could we replicate the seven-factor structure from the mentioned ESS studies. Problems regarding limited divergent validity between value orientations, causing high correlation between factors and numerous cross-loadings, have been documented before (Davidov, 2008, 2010; Davidov, Schmidt, & Schwartz, 2008; Knoppen & Saris, 2009). For this reason, we used the magnifying glass strategy (Cieciuch & Schwartz, 2012) to investigate each latent higher-order factor separately, with small adjustments concerning one item deletion and allowing for several error correlations. As assumed, the universal applicability of the PVQ-21 was shown to be valid for China with the expected limitation that only partial scalar invariance of the PVQ-21 was found across the student samples from China, Germany, and Russia. Hence, the methodological hypothesis was confirmed.

As the methodological precondition for testing the four substantial hypotheses was met, we tested the four substantial hypotheses by comparing Chinese students' latent means of values with the two other student samples. The first substantial hypothesis of this study was confirmed.

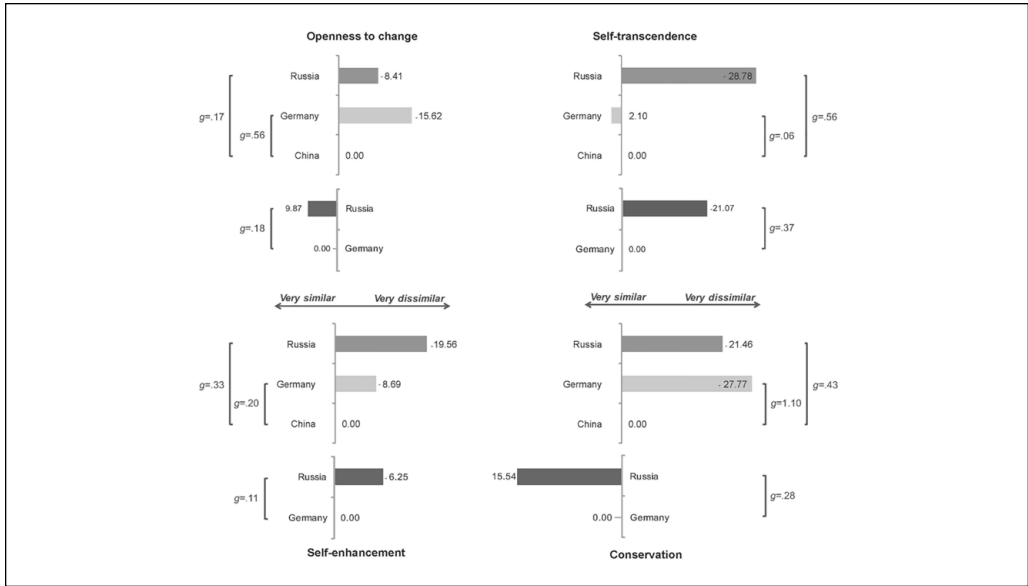


Figure 2. Latent mean differences between countries.

Note. The PVQ-21 provides short portraits of persons. Respondents rate how similar they feel they are to the portrayed person on a 6-point scale from 1 = *very similar* to 6 = *very dissimilar*. PVQ = Portrait Values Questionnaire.

Chinese students gave much importance to conservation values (tradition, conformity, and security) when compared with students from Germany and Russia. The effect of the mean difference was large in comparison with Germany, and medium in comparison with Russia. These findings are in line with current evidence which shows that traditional Chinese values, and particularly Confucian values, are still very prevalent among college students in contemporary China (Guo, 2008).

The second substantial hypothesis regarding openness to change was rejected. This hypothesis was formulated as a null hypothesis due to the fact that previous evidence did not provide a clear direction for the hypothesis. Results showed a small mean difference in comparison with Russia and a medium-size mean difference compared with Germany. Theoretically, openness to change reflects motivational goals that are located opposite to conservation values in the circular structure of values. Therefore, the fact that Chinese students scored highest on both factors seems contradicting. However, this finding is in line with the evidence outlined in the introduction, whereupon values in Chinese young people are diverse and sometimes contradicting, as they have to seek their way through the cultural philosophical heritage, on the one hand, and the massive influence of Western value, on the other hand (Guo, 2008).

The third substantial hypothesis regarding self-transcendence was rejected. A mean difference between the Chinese and German samples was not found, and China scored higher than Russia on this value dimension. To explain this result, a closer look at the two values that comprise self-transcendence (i.e., benevolence and universalism) is required. Benevolence is among the values which generally show low cross-cultural variation (Fischer & Schwartz, 2011). However, it might have been relevant to determine which group of close people respondents had in mind when answering the questions, for example, self-selected friends, the core family, or the extended family (Fischer, 2013). In China, people’s focus of family relationships is shifting from extended to core families (Huang et al., 2008), but students in Germany might also have been thinking about close friends. A closer look at this particular aspect would potentially have revealed cross-cultural differences after all.

With regard to universalism, the fact that Chinese students scored equally to German students is surprising. In Schwartz' (1994b) study on cultural values, China scored highest on mastery and hierarchy when compared with all other regions of the world and also showed a clear rejection of egalitarianism. It would be interesting to know whether a value shift has occurred at the cultural level over the past decades, yet our results are not representative for Chinese culture at large. But somehow, Chinese students seem to give more importance to egalitarian rights and care for nature than respondents in the Schwartz study that was conducted more than 20 year ago. This finding is relevant and interesting, and further research is needed to replicate and explain this result.

The fourth substantial hypothesis was accepted, as Chinese samples scored highest on self-enhancement, as well. High emphasis on self-enhancement in Chinese students can be explained with a general importance given to achievement and the pursuit of success in a fast growing economy. However, self-enhancement showed the lowest effect sizes of mean differences across our three samples. This might be due to the fact that self-enhancement corresponds to a specific commonality between student samples in general.

Taken together, results of this study reflect the value conflicts of young people in contemporary China. According to the Schwartz theory, giving high importance to values that are situated opposed to each other in the circular structure might cause intrapersonal conflicts. Our results might indeed have been caused by students' daily negotiation between tradition and modernization, between Confucian tradition and the rapid economic development after the Cultural Revolution (Guo, 2008). On the other hand, giving importance to different values at the same time does not necessarily lead to conflict, because students could simply pursue different values in different contexts: Whereas giving high importance to self-enhancement and openness to change at the university and among peers, conservation values such as conformity and tradition could be more emphasized in the family context. This would mean that value orientations are not transsituational after all, but rather change according to the specific context (Kulich & Zhang, 2010).

Results of this study require replication using representative samples. Moreover, new questions arise from our findings. For example, Schwartz (1994b) showed that on the cultural level, China scored high on intellectual but low on affective autonomy. In consequence, students might pursue intellectual autonomy at the university but low affective autonomy in the familial realm. Our data set could not answer such differential questions. In addition, Fischer (2013) showed that extending etic value frameworks such as the Schwartz value theory with emic value concepts brings forward very meaningful results. Similar results were found in China, where several researchers combined Schwartz values with emic values and found partial overlap, but also some additional culturally specific values (e.g., Jin et al., 2009). The refined value theory (Schwartz et al., 2012) might cover some of these emic values. For example, this theory includes *face* (maintaining and protecting prestige) as a subdimension of the power value, which might be particularly relevant for China (Hwang, 2011). A recent study of the refined Schwartz theory in China found satisfactory results with variations especially in social values (Li, 2016). Testing measurement invariance using this theory, and the respective versions of the PVQ, remains to be done in future research.

Limitations

Our study included student samples, which is a limitation. Due to the University and College Enrolment Expansion Plan, students in China are no longer a social elite but represent various social backgrounds, but results of this study can still not be generalized. An additional limitation refers to the use of the PVQ-21, for which problems regarding factor correlations have been reported before (Davidov, 2008, 2010; Davidov, Schmidt, & Schwartz, 2008). A further limitation of this study stems from the fact that we included samples from four different locations in China. Differences in values within societies have been shown to be larger than between countries (Fischer & Schwartz, 2011), and Schwartz (1994a, 1994b) had found differences across Chinese samples in

his study. In an additional analysis not presented in this study, we intended to compare value means across the four Chinese samples.³ However, we were not able to establish partial scalar invariance for three higher-order factors (openness to change, conservation, and self-enhancement) and could therefore not proceed to compare latent means across samples. Further analyses would be needed to find explanations for this result. Although Schwartz (1994b) had reported differences across Chinese samples, Kulich and Zhang (2010) referred to these differences as follows:

Schwartz (1992; personal correspondence) maintains that in the larger world picture of comparisons among seventy-seven countries (Schwartz, 2008), all of these Chinese samples share a strong emphasis on cultural hierarchy and mastery and a weak emphasis on cultural egalitarianism and autonomy, though he also notes there are variations among samples. (p. 260)

We decided to rely on this statement when combining the four Chinese samples.

Conclusion

The present paper adds an important piece of evidence to the existing empirical evidence of the universality of the Schwartz value theory. Our results show that this theory is relevant and meaningful for capturing value orientations among students in China. Several questions arise from our results, for example whether Chinese students themselves perceive their value orientations as conflictive, and how this affects their well-being. Value conflicts might cause distress on the one hand, but on the other hand, pursuing diverse values might contribute to fulfilling experiences in different realms such as the family and the university. Such far-reaching research questions remain to be answered in the future.

Appendix

PVQ Items

1. Thinking up new ideas and being creative is important to him/her. He/she likes to do things in his/her own original way. (self-direction)
2. It is important to him/her to be rich. He/she wants to have a lot of money and expensive things. (power)
3. He/she thinks it is important that every person in the world should be treated equally. He/she believes everyone should have equal opportunities in life. (universalism)
4. It's important to him/her to show his/her abilities. He/she wants people to admire what he/she does. (achievement)
5. It is important to him/her to live in secure surroundings. He/she avoids anything that might endanger his/her safety. (security)
6. He/she likes surprises and is always looking for new things to do. He/she thinks it is important to do lots of different things in life. (stimulation)
7. He/she believes that people should do what they're told. He/she thinks people should follow rules at all times, even when no-one is watching. (conformity)
8. It is important to him/her to listen to people who are different from him/her. Even when he/she disagrees with them, he/she still wants to understand them. (universalism)
9. It is important to him/her to be humble and modest. He/she tries not to draw attention to himself/herself. (tradition)
10. Having a good time is important to him/her. He/she likes to "spoil" himself/herself. (hedonism)
11. It is important to him/her to make his/her own decisions about what he/she does. He/she likes to be free and not depend on others. (self-direction)

12. It is very important to him/her to help the people around him/her. He/she wants to care for their well-being. (benevolence)
13. Being very successful is important to him/her. He/she hopes people will recognize his/her achievements. (achievement)
14. It is important to him/her that the government ensures his/her safety against all threats. He/she wants the state to be strong so it can defend its citizens. (security)
15. He/she looks for adventures and likes to take risks. He/she wants to have an exciting life. (stimulation)
16. It is important to him/her always to behave properly. He/she wants to avoid doing anything people would say is wrong. (conformity)
17. It is important to him/her to get respect from others. He/she wants people to do what he/she says. (power)
18. It is important to him/her to be loyal to his/her friends. He/she wants to devote himself/herself to people close to him/her. (benevolence)
19. He/she strongly believes that people should care for nature. Looking after the environment is important to him/her. (universalism)
20. Tradition is important to him/her. He/she tries to follow the customs handed down by his/her religion or his/her family. (tradition)
21. He/she seeks every chance he/she can to have fun. It is important to him/her to do things that give him/her pleasure. (hedonism)

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Notes

1. The refined theory which proposes 19 values was not yet published when data for this study were recollected.
2. A separate analysis omitting international students in Germany did not yield different results.
3. Due to limited space, this analysis was not presented in the Results section. However, if readers are interested in this, results can be requested from the corresponding author.

Supplemental Material

The online appendix can be accessed at <http://journals.sagepub.com/doi/suppl/10.1177/0022022117692675>.

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