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Should ratings of the importance of personal values be centered?

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ABSTRACT

Research on personal values is based on persons' ratings of the importance of values. Typically, the means of these ratings are discarded as response style artifacts through centering the data, person by person. We show that centering leads to more circular value configurations with lower Stress in MDS than using raw data. For unfolding models, we show that using raw data avoids some special issues in unfolding; the model space requires one additional dimension; after appropriate rotations, the value circle emerges in a plane; the persons' scattering about this plane corresponds to their mean ratings. The mean ratings correspond to the first principal component of the value items. It is demonstrated that mean ratings can also be substantively meaningful.

1. Introduction

Personal values are broad trans-situational goals that serve as guiding principles in a person's life. According to Schwartz (1992), there are ten basic values (such as Power, Security, and Benevolence). The inter-correlations among items measuring persons' attitudes towards these values exhibit certain gradients that can be visualized as a circle of wedge-like regions ("circumplex") in 2-dimensional MDS space (e.g., Dobewall & Rudnev, 2014; Döring et al., 2015; Schwartz, 1992) or simply as a circle if one summarizes the items measuring each respective value type (Groenen & Borg, 2015). The values are typically ordered in a circular way as Power—Achievement—Hedonism—Stimulation—Self-Direction—Universalism—Benevolence—Tradition—Conformity—Security—Power.

Beginning with Schwartz and Bilsky's (1987, 1990) seminal articles, there has been a huge number of publications on personal values relying on questionnaire data. Most previous research used the Schwartz Value Survey (SVS) (Schwartz, Sagiv, & Boehnke, 2000) or the Portrait Value Questionnaire (PVQ40; Schwartz, Lehmann, & Roccas, 1999) to measure the importance of different values. The ratings collected with such instruments are typically not used directly in subsequent analyses. Rather, they are first *centered*, person by person, on the individuals' mean value scores, or the means are partialled out statistically from the value scores (Sagiv & Schwartz, 2000; Schwartz, 1992; Sortheix & Lönnqvist, 2014). Schwartz (2003, p. 275) argues that it is "critical to correct for individual differences in use of the response scale. It is the tradeoffs between relevant values that influence behavior and attitudes, so it is the relative importance of the ten values to an individual that should be measured". On the other hand, Schwartz (2009) recommends using uncorrected raw scores of value items or indexes in MDS, possibly because it does not matter much in MDS.

If value ratings are centered, each person's mean rating score is subtracted from his/her rating scores, yielding deviation scores as "corrected" data. The means themselves are usually interpreted as response style "artifacts" such as acquiescence, a tendency to "agree" with an item, whatever its content. Acquiescence generates a common source of variance in the items that inflates positive correlations and deflates negative correlations among a construct's items (Kam & Meyer, 2015; Weijters, Geuens, & Schillewaert, 2010). This can have major impact on the structure of the items. Rammstedt, Goldberg, and Borg (2010) have shown, for example, that using mean-corrected Big5 ratings for persons with low levels of formal education leads to factor-analytic solutions that support the Big5 model "with textbook-like clarity" while factor analyses based on raw ratings do not show the expected 5-factor structure. Yet, centering or, more generally, ipsatizing has its "pros and cons" (cf. D'Andrade, 2008). There are formal arguments and much discussion on whether mean ratings measure "substance" or "style" or a certain combination of both (McCrae & Costa, 1983; Schwartz, Verkasolo, Antonovsky, & Sagiv, 1997). Fischer (2004) in a review article of typical standardization methods in

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cross-cultural research writes that the results are "ambiguous", while He and van den Vijver (2015, p. 129) even conclude on the basis of a longitudinal study on response styles (acquiescence, social desirability, midpoint tendency and extreme response style), personality traits, and values that "score corrections to deal with response styles are not recommended". They also note that "response styles may have substantive meaning as they are found to share trait variance with personality and values". One such meaning is the person's communication or presentation style. Thus, rather than eliminating this information as a method artifact, one may want to integrate it into the model of interest.

In value research, centering or partialling out the individuals' mean ratings is common practice, but there are also studies on personal values that use the raw data directly (cf. Parks-Leduc, Feldman, & Bardi, 2015). Yet, there is a lack of studies that systematically investigate the effects of centering value ratings on models of personal values or studies on the possible substantive meaning of the individuals' mean value rating.

When running the typical ordinal MDS analysis of the intercorrelations of value items or indexes, centering or not centering the data before computing correlations does not seem to make much difference. Either type of data allows representing the variables with acceptable Stress values in 2-dimensional space. Yet, value researchers sometimes claim that centering often results in MDS solutions where the value points exhibit a more perfectly circular configuration. Moreover, if centering does indeed control for irrelevant variance, then using centered data should lead to smaller Stress values.

When studying the structure of personal values with the unfolding model, the effects of centering on the values' statistical structure are unknown. This is a serious lack of knowledge, since the unfolding model is a more fundamental model of personal values and judgments on personal values than correlation-based MDS or other approaches that study whether individuals can be fitted into the value circle (e.g., Gollan & Witte, 2014). First, unfolding is the only model to date that represents both persons and values in a common space. The existence of a circle of values or, indeed, of a circle with a particular order of value points is not assumed in unfolding, but left open and therefore testable. Second, the rationale of the unfolding model corresponds directly to the rationale for the value circle as articulated in the original papers by Schwartz and Bilsky (1987, 1990), i.e. to a psychological theory on how the individual arrives at his/her judgments on the importance of personal values. Third, as Borg, Dobewall, and Aavik (2016) have shown, the unfolding model for personal values formally *implies* the MDS model based on correlations across persons (but not vice versa, of course, as persons are not represented in the usual MDS approach).

When testing the unfolding model, one begins with a data matrix of dissimilarity scores, δ_{pv}, for n_p persons and n_v personal values. One aims at optimally representing each δ_{pv} by a distance d_{pv} between a point for person p and a point for value v in an m-dimensional configuration. The configuration one seeks should minimize (raw) Stress,

$$\sigma = \sum_{p=1}^{n_p}\sum_{v=1}^{n_v}(\delta_{pv} - b \cdot d_{pv})^2, \ (b > 0), \qquad (1)$$

where b is a substantively irrelevant overall scaling factor of the resulting MDS configuration. Dissimilarities are non-negative scores on a ratio scale, with zero indicating maximal proximity. They are either collected directly, or they are generated from importance ratings by scale reversal, i.e. by subtracting all rating scores from some constant k. The minimal k is equal to the greatest observed rating score (max). For an r-point rating scale, typically $max = r$. Using $k = r$ is optimal, because it means that the ratings are converted in a meaningful way, where "fully agree" is turned into "no dissimilarity" for all respondents.[1]

In case of centered ratings, however, it is less clear how to pick k, because subtracting the rating scores from a constant k for all persons introduces a common origin for the dissimilarities. This leads to scores that may not be psychologically convincing. If, for example, person p uses only small ratings and some other person p' only large ratings, then subtracting the centered ratings of both persons from $k = r$ leads to dissimilarities that suggest that p is just as close to the various personal values as p' – even though the labels of the rating scale said that low ratings mean low importance, and high ratings high importance. Moreover, even without verbal labels, the respondents can generally be expected to understand what the researcher wants to know from them, namely to what extent they support the items' statements (Tourangeau, Rips, & Rasinski, 2000). Centering usually means that the researcher believes that the respondents cannot or do not handle the rating task properly. Yet, persons who assign low importance scores to all values may not care much about these values "as guiding principles in their life", while people who score at least some of these values as highly important may be more *value-guided* in general. This general value-guidedness of a person may be important for predicting certain dependent variables.

Numerous studies exist where value ratings are studied as predictors of other variables. Parks-Leduc et al. (2015), for example, report a meta-analysis of 60 studies on the relationships between the Big5 personality traits and the ten basic Schwartz (1992) values. These studies use either centered value ratings or "uncorrected" ratings, but never both. Both types of data show similar positive correlations of Big5 factors to the values, but only the centered ratings exhibit consistent patterns of strong negative correlations to Big5 factors. Yet when comparing these two sets of correlations it is important to bear in mind that centering the data also impacts their interpretation. Finding that centered ratings on the value Power correlate with −0.57 (meta-analytic Rho) with the Big5 factor Agreeableness and with +0.59 with the value Benevolence, means that we are looking at the respondents' ratings on Power *relative to their ratings on all other values*. When looking at non-centered ratings, the correlations change to −0.25 and 0.59, and the meaning of these correlations is direct, i.e. higher scores on Power go with lower scores on Benevolence, etc.

In some cases, such relative importance scores are of direct interest. For example, Bardi, Buchanan, Goodwin, Slabu, and Robinson (2014) show how values change relative to each other in self-chosen life-transitions such as migrating from one culture to another culture. In other cases, however, the absolute rating scores matter. For example, one may speculate that a core construct of well-being, a person's sense of meaning in life, is related to having strong notions about guiding principles in one's life (Heintzelman & King, 2014). That means that at least some values should be rated as *absolutely*, not just *relatively* very important values. Individuals who attribute relatively high ratings to the basic values—and, thus, have higher mean value ratings–are more value-guided and should therefore score higher on measures of subjective well-being.

A number of hypotheses can be derived about using raw or centered (or partialled) ratings in value research.

[1] Larger k's also generate proper dissimilarities, but make them numerically more similar. This also makes the distances from each person point to the various value points more similar, and this ultimately leads to trivial unfolding solutions such as a circular configuration of value points and a compact cluster of person points at the center of the value points. Moreover, the larger k, the smaller the Stress in general, i.e. the better the fit of the model to the data. Indeed, very large k's *always* lead to zero Stress for *any* observed importance ratings, suggesting a perfect fit of the model to the data.