Testing the Circular Structure and Importance Hierarchy of Value States

in Real-Time Behaviors

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Highlights for “Testing the Circular Structure and Importance Hierarchy of Value States in Real-Time Behaviors”

- We distinguish value traits from value states.
- Value states for volitional acts reproduce the circular structure of value traits.
- Value states for non-volitional acts do not reproduce the circular structure.
- The hierarchy of value states differs from the hierarchy of value traits.
Abstract

This research is the first to assess directly Schwartz’s claim that the circular structure of values derives from value compatibilities or conflicts experienced in real-time behaviors. We differentiate two types of values: value traits guide perception and behavior over time and situations and value states guide real-time behavioral acts. We measured the value states of 374 participants for 13,873 behavioral acts with experience sampling, distinguishing volitional from non-volitional acts. As hypothesized, value states for volitional acts, but not for non-volitional acts reproduced the circular value structure. The importance hierarchies of value states differed substantially from the importance hierarchy of value traits, suggesting that the importance of value states depends more on situations than on the hierarchy of value traits.

*Keywords*: value states, value traits, value structure, value priorities, experience sampling
1. Introduction

The Schwartz (1992) theory of basic values defines values as decontextualized life goals that vary in importance as guides to perception and behavior. The more important a value, the more likely it is to serve as a guide. Voluntary acts that promote attainment of the goals of a value express the importance of that value to the actor.

The theory postulates that relations among values take the form of a circular motivational continuum (Schwartz 1994, 2015). Relations between values and actions are a major source of this circular structure, according to the theory (Schwartz, 1992, 2015). The theory assumes that real-time acts that express or promote attainment of each value also simultaneously inhibit or undermine attainment of other values. For example, skydiving promotes the goals of stimulation values but undermines security values. Similarly, manipulating others promotes the goals of power values but undermines benevolence values. And criticizing one’s boss promotes the goals of self-direction values but undermines conformity values. These three examples identify behaviors with opposing implications for attaining the goals of particular pairs of competing values, stimulation versus security, power versus benevolence, and self-direction versus conformity.

When many real-time acts consistently promote the goals of one value while frustrating the goals of another, the two values can be seen as competing or conflicting. The choice to enact behaviors that promote one value will usually entail sacrificing the other value. The conflicts between pairs of values when enacting single, real-time acts give rise to their opposing positions in the motivational circle of values.

Across time and circumstances, people are more likely to choose to enact behaviors that promote their more important values. However, on some occasions they may choose to act in ways that promote less important or competing values, depending on circumstances.
But, the theory argues, people cannot choose to promote competing values simultaneously in any single act.

Single, real-time acts may express or promote attainment of more than one value. For example, criticizing one’s boss as prejudiced expresses self-direction values but also universalism values. It may also promote attainment of stimulation values. If various single acts tend to express the importance of a set of values simultaneously, those values are compatible. Adjacency of values in the motivational circle signifies their compatibility. Thus, self-direction values are adjacent to universalism values on one side and to stimulation values on the other. Similarly, tradition and security values are adjacent to conformity values because many acts that promote the goals of conformity values also promote the goals of tradition and security values.

In sum, according to the theory, the circular continuum of values captures the conflicts and compatibilities among the values. Although people can and do pursue the goals of competing (i.e., opposed) values, the theory postulates that they cannot do so in the same, single act. Surprisingly, this central assumption of the theory—the basis of the circular structure of values in real-time behavioral acts—has not been subject to a direct test.

Numerous studies, both within and across persons, including self- and other-reports, and spanning multiple cultures, have confirmed the circular structure of basic values (Bilsky, Janik, & Schwartz, 2011; Borg, Bardi, & Schwartz, 2015; Borg, Dobewall, & Aavik, 2016; Schwartz, 2015; Skimina & Cieciuch, 2017). All of these studies used global measures of value importance; they asked people how important different values are to them in general, that is, values as dispositions or traits. None of the studies asked people which values are more or less important to them in their current, real-time behavior. Our research addresses this crucial gap in the literature. Thus, the first aim of this research is to examine the structure
of values as reflected in their importance in single behavioral acts, the presumed basis of the circular structure of values.

Although people differ in the importance they attribute to basic values, there is substantial consensus across almost all societies regarding the hierarchical order of values. Questionnaire-based studies in which people report their general preferences for values reveal that benevolence, universalism, and self-direction are the most important values and that power and stimulation are the least important values both for adults and children (Döring, et al. 2015; Schwartz & Bardi, 2001). To date, however, no research has asked which values are most and least important in guiding real-time, everyday behavioral acts. The second aim of this research is to address this question.

2. Value traits and value states

Our approach to studying the importance of the values that guide behavioral acts is analogous to Fleeson’s (2001) approach to personality states. He defined personality states as very short duration expressions of personality traits with the same affective, behavioral, and cognitive content as the corresponding trait (Fleeson & Gallagher, 2009). For example, consider extraversion. To measure the state, respondents report the degree to which a given real-time behavior expresses extraversion (or other traits). In this approach, traits are density distributions of states.

We make a similar differentiation with regard to values. Values are like traits when understood as decontextualized life goals that vary in importance as guides to perception and behavior over time and situations (Schwartz, 1992). Values are like states when understood as goals that vary in importance as guides to real-time behavioral acts. Thus, according to the value theory, a circular structure of values can derive from the conflict and compatibility among values experienced through value states. Self-reports of general trait-like value preferences reflect the accumulation of these experiences over time and situations.
The experience sampling method (ESM) we used enabled us to measure values as states experienced in real-time behavioral acts. The ESM permits assessment of value states experienced in natural settings, in real time, and across repeated occasions (Hektner, Schmidt, & Csikszentmihalyi, 2007). Participants report on their experiences multiple times per day for multiple days (Conner, Feldman Barrett, Tugade, & Tennen, 2007).

Studies of personality states have implemented ESM (Fleeson, 2001; Fleeson & Gallagher, 2009), but this is its first application for studying value states. Using ESM for studying values provides a perspective that differs from the usual questionnaire approach. Value questionnaires probe the importance of each value to individuals as general, guiding dispositions. ESM probes the importance of each value to individuals as guiding states for particular single, real-time behavioral acts. Thus, our application of ESM enables us to test whether the circular structure of relations among values emerges from real-time measures of the relative importance of different values in single behavioral acts. In the methods section, we describe the way we adapted ESM to measure the importance of values in real-time behavioral acts.

3. Volitional versus non-volitional behavioral acts

In studying real-time behavior, we distinguished between volitional and non-volitional behavioral acts. We defined volitional acts as self-chosen and non-volitional acts as coerced by other people or circumstances. These definitions correspond to the two extreme motivation types distinguished by Deci and Ryan (2000): autonomous motivation (volitional acts) and controlled motivation (non-volitional acts). Self-Determination Theory (SDT; Deci & Ryan, 2000) assumes that autonomy—defined as perception that one’s activity was self-chosen—is one of three psychological needs essential for understanding of goal-directed behavior and for achieving well-being. This basic assumption has served as the theoretical basis for numerous experience sampling studies. These studies have examined associations
between perceived autonomy during real-time activities and well-being (e.g., Grund, Grunschel, Bruhn, & Fries, 2015; Reis, Sheldon, Gable, Roscoe, & Ryan, 2000), mood (e.g., Weinstein & Mermelstein, 2007) and optimal experience (e.g., Bassi & Delle Fave, 2012). SDT further assumes that people express their traits differently in various situations as a function of how much their need for autonomy is satisfied (La Guardia & Ryan, 2007). Experience sampling studies have built on this assumption to investigate within-person personality variability (Ching et al., 2014; Church et al., 2013).

Distinguishing volitional from non-volitional behavioral acts is especially important for investigating relations of value states to action. Reis et al. (2000) highlighted the link between autonomy and values by defining autonomy as feeling that what one is doing expresses one’s true values.

Values guide people’s choices, explicitly or implicitly, to act one way or another. The less an action is the product of choice, the less likely it is to be influenced by one’s personal value priorities. For example, people’s value priorities substantially predicted how religious people chose to be but not how much positive affect they said they experienced (Roccas, Sagiv, Schwartz, & Knafo, 2002; Schwartz, 2015). If strong situational circumstances coerce various actions, virtually eliminating choice, those actions will not reflect the importance of individuals’ unique personal values. Consequently, the actions and the reasons given for enacting them will provide little information about individuals’ actual values. These non-volitional acts and their reported motivations are unlikely to reflect the structure of relations among personal values because that structure derives from actions chosen to pursue the goals of particular values at the expense of opposing values.

Another understanding of the relationship between values and actions also suggests that volitional acts are more relevant to the value structure. Values and actions have a reciprocal relationship. Not only do values guide actions, but actions influence values
Both consistency (Heider, 1958) and self-perception theories (Bem, 1972) provide rationales for this claim. After enacting a behavior, people are likely to modify their value priorities, to change the importance they ascribe to different values in order to make their priorities more consistent with their actions and the goals implied by taking those actions. This process of changing cognitions consequent upon actions occurs primarily for volitional behavior.

4. The current study

The current study addresses two main questions. (a) Does the importance of value states in real-time behavioral acts reproduce the circular structure of values observed with measures of value traits? (b) Is the importance hierarchy of the values expressed in real-time behavioral acts (value states) similar to the hierarchy obtained when individuals report their value preferences in a value questionnaire (value traits)?

Based on the reasoning presented above we formulated two hypotheses.

Hypothesis 1: The structure of relations among value states assessed as important in real-time, volitional behavior is consistent with the circular motivational continuum postulated by the theory of basic values.

Hypothesis 2: The importance hierarchy of value states assessed in real-time, volitional behavior is more similar to the hierarchy in self-reports of value importance on questionnaires (i.e., traits) than is the hierarchy assessed in real-time non-volitional behavior.

5. Method

5.1. Participants

The study was conducted in Poland with a sample recruited by trained, paid research assistants. The recruited participants took part in a three-wave study including an online self-report questionnaire and an experience sampling in each wave. The data analyzed in this
study comes from the first wave. After completing all three waves, participants received a voucher worth 70 PLN (approximately 20 USD). From the sample of 652 participants who started to participate in the experience sampling phase (ESM), we selected 445 participants who responded to the prompts in their device at least 20 times. The final sample consisted of 374 persons, who both filled in the value inventory before participating in the ESM, and who responded at least 20 times to the prompts in their device during the ESM phase of the study. Their age ranged from 17 and 53 (\( M = 23.72, SD = 4.67 \)), 78.9% were female, all Caucasian.

We confirm that we made an effort to report all measures and data exclusion procedures in the manuscript. If any further details about the design are unclear, they may be provided by the first author upon request.

5.2. Procedure

Participants first completed a value questionnaire online. They then downloaded a mobile app (RealLife Exp) to their own mobile device and activated it. For the next seven days, the app sent participants a prompt seven times per day, at random times between 9.30 a.m. and 9.30 p.m. with a minimum of 60 minutes between prompts. The prompts provided a link to the ESM questions and remained active for 45 minutes. Each question in the ESM appeared on a separate screen. Responding to the questions did not require an internet connection. Responses were sent to the server when the participant’s device was connected to the internet.

5.2.1. Experience sampling

To identify the values important in real-time behavioral acts, the prompt presented 16 questions to participants (including five, closed-ended, not relevant to this study). A first, open-ended question asked, “What have you been doing during the past 15 minutes?” The second question measured whether the activity was volitional or not. It presented two options: “This activity was imposed by another person or by the circumstances” or “This activity was
my choice—I could either do or not do it.” Next, participants were asked, “When you were engaging in this activity, how important was it to you to…?” This question appeared on the screen of their device nine times, each time ending with a different value (e.g., enjoy yourself, avoid danger). Table 1 presents all endings, the values they measured, and short value definitions. The value questions appeared one at a time, in random order. Participants responded on a scale from 1 (not important at all) to 4 (very important). We selected the values from the refined theory of 19 basic values (Schwartz, et al. 2012; Schwartz, 2017). Responding to a question on each of the 19 values several times a day in unexpected situations would doubtless be exhausting. We therefore selected only nine values, two from each higher order value (plus hedonism). The items included one value from each of the original ten basic values (except tradition, which we excluded based on the belief that people pursue it infrequently in everyday behavior).

| Table 1 |

5.2.2. Value questionnaire

We used the Portrait Values Questionnaire – Revised (PVQ-RR; Schwartz, 2017) to measure general value priorities. The PVQ-RR consists of 57 items that index the 19 values in the refined theory of basic values (Schwartz et al., 2012; Schwartz 2017). Each item describes a different person in terms of his or her values. Respondents report how similar the person described in each item is to themselves on a 6pt scale (from 1 – not like me at all to 6 – very much like me).

5.2.3. Pool of behaviors

Participants provided responses for 13,873 separate behavioral acts. Of these, 9,592 were described as volitional, 4,254 as non-volitional, and 27 were not classified. The average number of acts per person was 37.1, with a range from 19 to 49.
From the non-volitional pool, we excluded observations if there were less than four of them provided by the same person. The final analyzed pool of responses associated with volitional behaviors was 9,592, provided by 374 participants (a mean of 25.6 responses per person). The final analyzed pool of responses associated with non-volitional behaviors was 4,181, provided by 324 participants (a mean of 12.9 responses per person). The data had a multilevel structure (Hox, 2002) because there were several value states measured within each respondent. Based on Maas and Hox (2005), one can conclude that all multilevel estimates can be treated as unbiased and accurate because of the large number of participants in both pools, despite the low number of observations provided by some participants.

6. Results

6.1. Descriptive statistics

Descriptive statistics for items measuring value states in ESM were computed using two packages for R: multilevel (means and standard deviations; Bliese, 2016) and psych (ICC(1) and ICC(2); Revelle, 2017). Table 2 presents descriptive statistics computed on the entire sample of 13,873 responses. The standard deviation for the importance of each value state was always higher within-persons than between-persons. This indicates that the intra-individual variance in value importance for different behaviors was larger than the between-person variance in average importance of the values pursued across situations. Table 2 also presents two intraclass correlation coefficients (ICC). ICC(1) shows the total variance attributable to persons. These value state results are similar to the personality state results measured with ESM (cf. Fleeson & Gallagher, 2009). ICC(2) shows that the between-person variance, all > .9, is sufficient to differentiate between persons (Bliese, 2016).

Table 2

Table 3 presents descriptive statistics for items measuring value importance in ESM computed separately on the pools of volitional and non-volitional behaviors. The standard
deviation of the values within person was always higher than between persons for both volitional and non-volitional behaviors. The within-person variance was slightly higher for volitional behaviors, whereas the between-person variance was slightly higher for non-volitional behaviors. ICC(2) was slightly lower in the pool of non-volitional behaviors, perhaps due to the smaller number of observations per person in this pool.

Table 3

Table 4 presents descriptive statistics for the value traits, measured with the PVQ-RR questionnaire, together with zero-order correlations between the values and their Cronbach’s alpha coefficients. Scores were mean-centered before computing the correlations (i.e., individuals’ average rating of all values was subtracted from each value score). The Cronbach’s alpha coefficients of the nine value indexes were adequate, especially considering that each was based on only three items. The signs of the correlation coefficients were congruent with the theory (Schwartz et al., 2012).

Table 4

6.2 The structure of value states assessed in real-time, behavioral acts

We tested the circular structure of value states with two-dimensional, ordinal, multidimensional scaling (MDS), using SPSS 22. We analyzed the structure of values assessed for importance in volitional and non-volitional behaviors separately. Figures 1a (for value states expressed in behaviors tagged by participants as volitional) and 1b (for value states expressed in behaviors tagged by participants as non-volitional) present the results.
Figure 1. Multidimensional scaling of nine value states measured via ESM in current (A) volitional and (B) non-volitional behavior. Abbreviations for value names are presented in Table 1.

The structure of values important in real-time, volitional behaviors was consistent with the theorized order around the motivational circle. The nine values formed the typical two-dimensional structure that opposes Conservation values (security-personal and conformity-rules) to Openness to change values (self-direction-thought, hedonism, and stimulation) and Self-enhancement values (achievement and power-resources) to Self-transcendence values (benevolence-caring and universalism-concern). The data for non-volitional behavior did not replicate this structure. For those data, the values expected to be in the same quadrants according to theory were located in different quadrants for Conservation, Openness to change and Self-Transcendence.

6.3. Comparison of the importance hierarchy of value traits and of value states.

We computed four different hierarchies of values. Column a in Table 5 presents the average ratings of the value traits across all persons, based on responses to the PVQ-RR. Following the recommended procedure, we centered each person’s responses on his or her
average response to eliminate individual differences in response tendencies (Schwartz et al., 2012). Column b presents the average ratings of the value states across all persons, based on the ESM responses. We also centered these ratings within person before averaging them (column b). Columns c and d present the average ratings of each value state for volitional and non-volitional behavioral acts, respectively, averaged across acts, not people. These averages reveal differences in the importance of value states as a function of whether the acts were volitional or non-volitional, regardless of variation in response tendencies across people. We therefore did not center these ratings within person. These averages are based on means calculated for each variable for each person, so that each participant’s scores are weighted equally.

Table 5

The hierarchy of value traits based on the PVQ-RR (column a) is consistent with that found across the majority of samples studied with questionnaires. Benevolence and self-direction values are highly important and power and stimulation values are unimportant (Schwartz & Bardi, 2001). The hierarchy based on the mean ratings of the value states from ESM (column b) differs markedly. Power and hedonism values are most important and benevolence and universalism are unimportant. The Spearman rank correlation between the two hierarchies is -.30. The hierarchies based on mean ratings of the importance of each value in both volitional (column c) and non-volitional (column d) behavioral acts, averaged across acts, also differed substantially from the PVQ-RR hierarchy. For volitional acts, the Spearman rank correlation was -.23; for non-volitional acts, it was -.36.

Two differences between the trait and state hierarchies are especially striking. Benevolence-caring is at the top of the trait hierarchy but relatively unimportant as a motivator of real-time behavioral acts. In contrast, power-resources is very important as a motivator of real-time behavioral acts but at the bottom of the trait hierarchy. The hierarchies
for behavioral acts also reveal noteworthy differences between the values that motivate real-time volitional and non-volitional behavior. Hedonism and stimulation values are important motivators of volitional but not of non-volitional behavior. In contrast, conformity-rules is a much more important motivator of non-volitional than of volitional behavior.

Because the comparison of hierarchies presented above does not take into account the multilevel structure of the data, we conducted additional analyses to examine the hierarchies on the within- and between-person levels. Using multicon package for R (Sherman & Serfass, 2015), we computed hierarchy (profile) agreement and value-level agreement between the importance of value traits and value states, separately for volitional and non-volitional acts. We based the analyses on person-centered means from ESM for states and from the PVQ-RR for traits. For value hierarchies, we calculated the agreement between each person’s importance hierarchy (profile) of nine value traits and importance hierarchy (profile) of nine value states. We then averaged across all persons to obtain the mean hierarchy (profile) agreement. At the value-level, we calculated the agreement for pairs of state and trait measures of each value separately (e.g., the achievement state-trait pair, the power-resources state-trait, etc.). The results portray the average within-person agreement regarding each value across the whole sample.

Because the list of ICCs for each participant would be troublesome to interpret, we calculated descriptive statistics of ICCs that show the distribution of within-person profile-level agreement in the whole sample. We reported ICC(1,1) based on Shrout and Fleiss’ (1979) recommendations. Table 6 reveals near zero average within-person hierarchy (profile) similarity of the importance of value traits and of value states both for volitional and non-volitional real-time behaviors. Although the mean and median coefficients were near zero, agreement varied substantially among participants. Some were characterized by high profile
similarity (> .6) between their trait and state importance hierarchies whereas others were
categorized by low profile similarity (< − .7).

Table 6

Table 7 reports average within-person agreement between each value trait and its
corresponding value state across the sample. The comparison of the ICCs for each value
indicates that agreement between the importance of value traits and corresponding value
states varied across values. For volitional acts, security-personal and hedonism exhibited the
highest average within-person agreement whereas benevolence-caring and power-resources
exhibited the least agreement. For non-volitional acts, security-personal and stimulation
exhibited the highest average within-person agreement whereas benevolence-caring, power-
resources, and conformity-rules exhibited the least agreement. These results strengthen the
evidence for discrepancies between hierarchies presented in Table 5.

Table 7

In sum, the additional analyses of profile similarity confirmed the conclusions from
comparison of value hierarchies: During everyday activities, people pursue different values
than they report as important in a value questionnaire. The importance hierarchies of value
traits reported in questionnaires and of value states from ESM differ substantially. This is the
case for volitional as well as non-volitional acts. As expected, the value states that motivated
volitional acts were related structurally in a manner fairly consistent with the well-established
value circle of value traits. However, the hierarchies of value states were unrelated to those of
value traits, contrary to our expectation for value states that guide volitional behavior.

7. Discussion

We sought to test a central assumption of the values theory, that a major source of the
circular structure of values is the conflict or compatibility between values experienced in
real-time behavioral acts. For this purpose, we examined the structure of relations among the
values as important motivators of real-time behavioral acts. We also sought to compare the importance hierarchy of values experienced as important guides in real-time behavior (value states) with the hierarchy of values assessed as generally important in value questionnaires (value traits). This was the first values study to use the experience sampling method (ESM) and to measure the importance of values in real-time behavior.

We adapted Fleeson’s (2001) ESM approach to studying personality states in everyday behavior to the study of values. Using ESM, we measured values as states, not as general dispositions. We assumed that individuals are able to assess how important different values are to them as guides when they perform single behavioral acts.

We found that the within-person variability in value states across everyday activities is high and comparable to the within-person variability in personality states (Fleeson & Gallagher, 2009). Also, the between-person variance in value states was high enough to differentiate between persons. This indicates that values, like personality traits, are not only dispositions, but are also states that fluctuate from occasion to occasion.

We hypothesized that the structure of relations among values assessed as important in real-time, volitional behavior is consistent with the circular motivational continuum postulated by the theory of basic values (Schwartz, 1992, 2017; Schwartz et al., 2012). This follows from the assumption of the theory that the conflicts between pairs of values, when enacting single, real-time behaviors, give rise to their opposing positions in the motivational circle of values. Schwartz postulated that competing values cannot both drive an individual’s real-time behavioral acts. If one value is important as a motivator of a behavioral act, the values opposing that value in the motivational circle should be unimportant.

This first study of the structure of values important in real-time volitional behavior confirmed our hypothesis and supported the basic assumption of the values theory. The structure we observed was consistent with the theorized order of values around the circle. Our
findings suggest that, in real-time volitional behavioral acts, the values that simultaneously drive behavior are values located in close proximity in the circle. Moreover, the values that do not drive or may even inhibit the behavior are those located on the opposite side of the circle.

As expected, we did not observe a structure consistent with the theorized value circle for the value states related to non-volitional behavioral acts. If participants feel they have not chosen what they are doing, the values that drive their behavior, if any, are likely to reflect responses to external pressure. The emergence of conformity-rules as the most important value for non-volitional behaviors supports this idea. That power-resources was second most important may reflect the fact that material resources are extrinsic goals whose pursuit may be experienced as externally controlled (contingent on external rewards; Ryan & Deci, 2006). For non-volitional behavior, the inherent conflicts or compatibilities among the values that give rise to the value circle may have little relevance.

Our second goal was to compare the importance hierarchy of values experienced as important guides in real-time behavioral acts with the hierarchy of values assessed as generally important in value questionnaires. For this purpose, we compared the value state hierarchies assessed with experience sampling of volitional and non-volitional behavior with the value trait hierarchy assessed with the PVQ-RR. We hypothesized that the hierarchy of values expressed in volitional behavior is more similar to the PVQ-RR hierarchy than the hierarchy expressed in non-volitional behavior is. This hypothesis was not confirmed. Both hierarchies of value states in real-time behavior differed substantially from the hierarchy of value traits assessed by the PVQ-RR. Indeed, both hierarchies correlated negatively with the hierarchy of general values.

Additional analyses confirmed these findings. Average within-person similarity between importance hierarchies (profiles) of value states and of value traits, measured with
ICC, was close to zero for both volitional and non-volitional behavioral acts. This is consistent with the results of Ching et al. (2014) for personality traits. They reported that the level of autonomy people felt in everyday situations did not moderate the strength of the trait-state relationship.

However, Ching et al. (2014) found that the level of perceived autonomy did influence the degree to which people manifested certain traits. Similarly, the results of current study indicate that importance of value states depends on the level of volition. The importance hierarchies of value states differed not only from the hierarchy of value traits, but the value state hierarchies for volitional and non-volitional behavioral acts differed from one another. Hedonism and stimulation were substantially more important guides of volitional than of non-volitional acts whereas conformity-rules and achievement were substantially less important guides of volitional than of non-volitional acts.

These findings suggest that the relative importance of values to individuals measured by various questionnaires does not reflect the relative importance of values as guides to everyday, real-time behavior. Does this mean that the indexes of value importance based on questionnaires are necessarily inaccurate? We think not. First, there is ample evidence that such indexes relate in expected ways to a wide variety of attitudes, behaviors, and personality traits (e.g., Fischer & Boer, 2015; Schwartz, 2015, 2017; Strus & Cieciuch, 2017). Second, the frequency with which a given value is expressed in real-time behaviors depends not only on its general importance to the individual. It also depends on whether the value is relevant to the behaviors that the individual has opportunities or is constrained to enact in the normal course of daily activity. Particular values can be expressed only in specific situations. In this study, the prompts to report the importance of the values may have come while eating breakfast, commuting to work, or reading the news. In such situations, benevolence and
universalism values, for example, despite their general importance, are unlikely to be relevant to behavioral choices.

We suggest that the importance hierarchy of values assessed in real-time behavioral acts reflects two factors: (a) the frequency with which particular values are relevant in the situations sampled and (b) the general importance of those values to the individual. The general importance of the values comes into play by influencing the choice of which relevant values are more or less important as motivators of behavior. The current findings imply that the frequency with which particular values are relevant in daily situations has more influence on the hierarchy of values expressed in real-time behavior. Future research should compare how value importance expressed in real-time behavior versus in questionnaires predicts behavior across time and situations. Relations between value states and behavior per se was beyond the scope of the present report.

In sum, this study supports three conclusions. (a) The circular structure of values postulated by the theory of basic values (Schwartz, 1992; Schwartz et al., 2012) is replicable with real-time values data. This supports the central assumption of the theory that underlies the circle—competing values cannot be pursued in the same behavioral act. (b) This assumption holds for volitional behavior but does not hold for non-volitional behavior. (c) The hierarchy of values that people report as important to themselves in general differs substantially from the hierarchy of values expressed in their daily behavior.
References


Table 1

*Items measuring value importance in real-time behavior (ordered randomly)*

<table>
<thead>
<tr>
<th>When you were engaging in this activity, how important was it to you to ...</th>
<th>Value name</th>
<th>Value definition in terms of motivational goal (Schwartz et al., 2012)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- be better at something than others are</td>
<td>achievement (AC)</td>
<td>success according to social standards</td>
</tr>
<tr>
<td>- gain some advantage for yourself</td>
<td>power-resources (POR)</td>
<td>power through control of material and social resources</td>
</tr>
<tr>
<td>- avoid danger</td>
<td>security-personal (SEP)</td>
<td>safety in one’s immediate environment</td>
</tr>
<tr>
<td>- do what someone else expected</td>
<td>conformity-interpersonal (COI)</td>
<td>avoidance of upsetting or harming other people</td>
</tr>
<tr>
<td>- help people you care about</td>
<td>benevolence-caring (BEC)</td>
<td>devotion to the welfare of in-group members</td>
</tr>
<tr>
<td>- help someone you did not know</td>
<td>universalism-concern (UNC)</td>
<td>commitment to equality, justice, and protection for all people</td>
</tr>
<tr>
<td>- understand something or form an opinion on your own</td>
<td>self-direction-thought (SDT)</td>
<td>freedom to cultivate one’s own ideas and abilities</td>
</tr>
<tr>
<td>- experience something new or exciting</td>
<td>stimulation (ST)</td>
<td>excitement, novelty, and change</td>
</tr>
<tr>
<td>- enjoy yourself</td>
<td>hedonism (HE)</td>
<td>pleasure and sensuous gratification</td>
</tr>
</tbody>
</table>
Table 2

Descriptive statistics for items measuring value states (volitional and non-volitional acts combined), $N_{\text{level1}} = 13,873; N_{\text{level2}} = 374$

<table>
<thead>
<tr>
<th>Value</th>
<th>$M$</th>
<th>Between-person SD</th>
<th>Within-person SD</th>
<th>ICC(1)</th>
<th>ICC(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC</td>
<td>1.83</td>
<td>0.56</td>
<td>0.85</td>
<td>.26</td>
<td>.93</td>
</tr>
<tr>
<td>POR</td>
<td>2.76</td>
<td>0.57</td>
<td>0.92</td>
<td>.24</td>
<td>.92</td>
</tr>
<tr>
<td>SEP</td>
<td>2.11</td>
<td>0.72</td>
<td>0.85</td>
<td>.37</td>
<td>.96</td>
</tr>
<tr>
<td>COI</td>
<td>2.11</td>
<td>0.53</td>
<td>0.97</td>
<td>.19</td>
<td>.90</td>
</tr>
<tr>
<td>BEC</td>
<td>1.89</td>
<td>0.61</td>
<td>0.88</td>
<td>.29</td>
<td>.94</td>
</tr>
<tr>
<td>UNC</td>
<td>1.60</td>
<td>0.52</td>
<td>0.74</td>
<td>.27</td>
<td>.93</td>
</tr>
<tr>
<td>SDT</td>
<td>2.13</td>
<td>0.57</td>
<td>0.93</td>
<td>.24</td>
<td>.92</td>
</tr>
<tr>
<td>ST</td>
<td>2.05</td>
<td>0.55</td>
<td>0.90</td>
<td>.23</td>
<td>.92</td>
</tr>
<tr>
<td>HE</td>
<td>2.23</td>
<td>0.53</td>
<td>1.00</td>
<td>.19</td>
<td>.90</td>
</tr>
</tbody>
</table>

Note. Abbreviations of value names are presented in Table 1.
Table 3

Descriptive statistics for items measuring value states, separately for volitional (Vol, \(N_{\text{level1}} = 9,592; N_{\text{level2}} = 374\)) and non-volitional (Nvol, \(N_{\text{level1}} = 4,181; N_{\text{level2}} = 324\)) behaviors

<table>
<thead>
<tr>
<th>Value</th>
<th>(M)</th>
<th>Between-person SD</th>
<th>Within-person SD</th>
<th>ICC(1)</th>
<th>ICC(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vol</td>
<td>Nvol</td>
<td>Vol</td>
<td>Nvol</td>
<td>Vol</td>
</tr>
<tr>
<td>AC</td>
<td>1.73</td>
<td>1.98</td>
<td>0.57</td>
<td>0.71</td>
<td>0.80</td>
</tr>
<tr>
<td>POR</td>
<td>2.82</td>
<td>2.61</td>
<td>0.58</td>
<td>0.72</td>
<td>0.90</td>
</tr>
<tr>
<td>SEP</td>
<td>2.05</td>
<td>2.26</td>
<td>0.74</td>
<td>0.78</td>
<td>0.82</td>
</tr>
<tr>
<td>COI</td>
<td>1.85</td>
<td>2.63</td>
<td>0.55</td>
<td>0.65</td>
<td>0.85</td>
</tr>
<tr>
<td>BEC</td>
<td>1.92</td>
<td>1.88</td>
<td>0.62</td>
<td>0.71</td>
<td>0.88</td>
</tr>
<tr>
<td>UNC</td>
<td>1.49</td>
<td>1.81</td>
<td>0.53</td>
<td>0.66</td>
<td>0.63</td>
</tr>
<tr>
<td>SDT</td>
<td>2.12</td>
<td>2.16</td>
<td>0.59</td>
<td>0.69</td>
<td>0.93</td>
</tr>
<tr>
<td>ST</td>
<td>2.13</td>
<td>1.83</td>
<td>0.59</td>
<td>0.61</td>
<td>0.92</td>
</tr>
<tr>
<td>HE</td>
<td>2.47</td>
<td>1.69</td>
<td>0.56</td>
<td>0.58</td>
<td>0.99</td>
</tr>
</tbody>
</table>

*Note. Abbreviations for value names are presented in Table 1.*
Table 4

*Descriptive statistics and zero-order correlations between value traits measured by the PVQ-RR questionnaire*

<table>
<thead>
<tr>
<th>Scale</th>
<th>Descriptive statistics</th>
<th>Pearson zero-order correlations between PVQ-RR centered scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td>AC</td>
<td>4.90</td>
<td>0.86</td>
</tr>
<tr>
<td>POR</td>
<td>3.58</td>
<td>1.10</td>
</tr>
<tr>
<td>SEP</td>
<td>4.67</td>
<td>0.90</td>
</tr>
<tr>
<td>COI</td>
<td>3.75</td>
<td>1.07</td>
</tr>
<tr>
<td>BEC</td>
<td>5.22</td>
<td>0.72</td>
</tr>
<tr>
<td>UNC</td>
<td>4.54</td>
<td>1.02</td>
</tr>
<tr>
<td>SDT</td>
<td>4.90</td>
<td>0.74</td>
</tr>
<tr>
<td>ST</td>
<td>4.06</td>
<td>1.06</td>
</tr>
<tr>
<td>HE</td>
<td>4.78</td>
<td>0.84</td>
</tr>
</tbody>
</table>

*Note.* Abbreviations of value names are presented in Table 1. Cronbach’s alpha coefficients in bold.

* $p < .05$; ** $p < .01$; *** $p < .001$. 

Table 5

*Comparison of the importance hierarchy of value states and value traits*

<table>
<thead>
<tr>
<th>(a) Value Traits from PVQ-RR</th>
<th>(b) Value States from ESM</th>
<th>(c) Single Volitional Acts</th>
<th>(d) Single Non-volitional Acts</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEC</td>
<td>POR</td>
<td>POR</td>
<td>COI</td>
</tr>
<tr>
<td>SDT</td>
<td>HE</td>
<td>HE</td>
<td>POR</td>
</tr>
<tr>
<td>AC</td>
<td>SDT</td>
<td>ST</td>
<td>SEP</td>
</tr>
<tr>
<td>HE</td>
<td>COI</td>
<td>SDT</td>
<td>AC</td>
</tr>
<tr>
<td>SEP</td>
<td>SEP</td>
<td>SEP</td>
<td>AC</td>
</tr>
<tr>
<td>UNC</td>
<td>ST</td>
<td>BEC</td>
<td>BEC</td>
</tr>
<tr>
<td>ST</td>
<td>BEC</td>
<td>COI</td>
<td>ST</td>
</tr>
<tr>
<td>COI</td>
<td>AC</td>
<td>AC</td>
<td>UNC</td>
</tr>
<tr>
<td>POR</td>
<td>UNC</td>
<td>UNC</td>
<td>HE</td>
</tr>
</tbody>
</table>

*Note.* Abbreviations for value names are presented in Table 1.
Table 6

*Within-person agreement (ICC[1,1]) between each person’s profile (hierarchy) of value traits and of value states, averaged across persons*

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>Median</th>
<th>Min</th>
<th>Max</th>
<th>Skew</th>
<th>Kurtosis</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volitional behaviors</td>
<td>374</td>
<td>−.03</td>
<td>.30</td>
<td>−.03</td>
<td>−.72</td>
<td>.76</td>
<td>−0.07</td>
<td>−0.58</td>
<td>0.02</td>
</tr>
<tr>
<td>Non-volitional behaviors</td>
<td>325</td>
<td>−.09</td>
<td>.31</td>
<td>−.07</td>
<td>−.86</td>
<td>.67</td>
<td>−0.03</td>
<td>−0.52</td>
<td>0.02</td>
</tr>
</tbody>
</table>
Table 7

*Average within-person agreement between the importance of value traits and corresponding value states*

<table>
<thead>
<tr>
<th>Value</th>
<th>ICC&lt;sub&gt;[1,1]&lt;/sub&gt;</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Volitional Behaviors</td>
<td>Non-volitional behaviors</td>
<td></td>
</tr>
<tr>
<td>AC</td>
<td>-.29</td>
<td>-.11</td>
<td></td>
</tr>
<tr>
<td>POR</td>
<td>-.41</td>
<td>-.32</td>
<td></td>
</tr>
<tr>
<td>SEP</td>
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<td>.11</td>
<td></td>
</tr>
<tr>
<td>COI</td>
<td>.02</td>
<td>-.31</td>
<td></td>
</tr>
<tr>
<td>BEC</td>
<td>-.41</td>
<td>-.38</td>
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</tr>
<tr>
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<td>HE</td>
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<td>-.25</td>
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</tbody>
</table>

*Note.* Abbreviations for value names are presented in Table 1.