Examining the consistency and coherence of values in young children using a new animated values instrument

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Highlights

- We examined the consistency and coherence of values in early childhood
- We found children as young as five make consistent choices about their own values
- The value circle was evident at the sample and individual level in young children

1. Introduction

The purpose of this article is to examine the consistency and coherence of values in early childhood. Values are a key concept in personality and social psychology (Hitlin, 2003), as they define what is important to a person in their life. Researchers have investigated the importance and structure of values in hundreds of adult samples from over 80 countries (Schwartz, 2012). However, relatively few studies have investigated the importance and structure of values in children (e.g., Döring, Daniel, & Knafo-Noam, 2016).

A range of instruments have been developed to measure values but these rely on adequate reading ability, which limits their usefulness in the study of young children. In order to test the consistency and coherence of values in young children we introduce and test a new animated values instrument (AVI). This instrument was designed to take advantage of multimedia's capacity to effectively convey visual representations of unfamiliar elements to young children (Kim, Young, Neimeyer, Baker, & Barfield, 2008) and allow the assessment of consistency of value choice. Existing instruments were primarily designed to measure value priorities (i.e., how important certain values are to a child), rather than consistency and coherence of the value structure.

The structure of values within children is of particular interest in developmental psychology. From the beginning, findings in developmental psychology have emphasized the cognitive component (Piaget & Inhelder, 1969). Cognitive development of the child typically goes along with a better understanding of the self and a more differentiated understanding of one's own personality. A values instrument that not only measures the child's value priorities, but also values consistency and structure at a young age will enable researchers to better understand the development of values.

1.1 Personal Values Theory

Personal values represent motivational goals that are relatively stable across different contexts in adulthood (Rokeach, 1973; Schwartz, 1992). Values are central to our identity construction and concept of self (Hitlin, 2003). They convey what is important in our lives (Bardi & Schwartz, 2003) and motivate how we interact with and shape our world (Döring et al., 2016).

Schwartz (1992) advanced the field of values research by identifying a circular motivational continuum that underlies the structure of values. He partitioned this continuum into 10 universal value types and four higher order values, as presented in Figure 1. In this structure adjacent values in the circle (e.g., universalism and benevolence) are positively related as they express compatible motivations, whereas opposing values (e.g., power and universalism) are negatively related as they express conflicting motivations (Schwartz, 1992).

A long-standing assumption in values research has been that value structures exist within individuals, rather than only across individuals. Gollan and Witte (2014) and Borg, Bardi and Schwartz (2015) were the first to test this assumption in adults. Their results found that value structures exist within adults. They argue that it is very unlikely to find an adult who ascribes high importance to opposing values (Borg et al., 2015). We extend their research, to examine the consistency and coherence of values within young children.

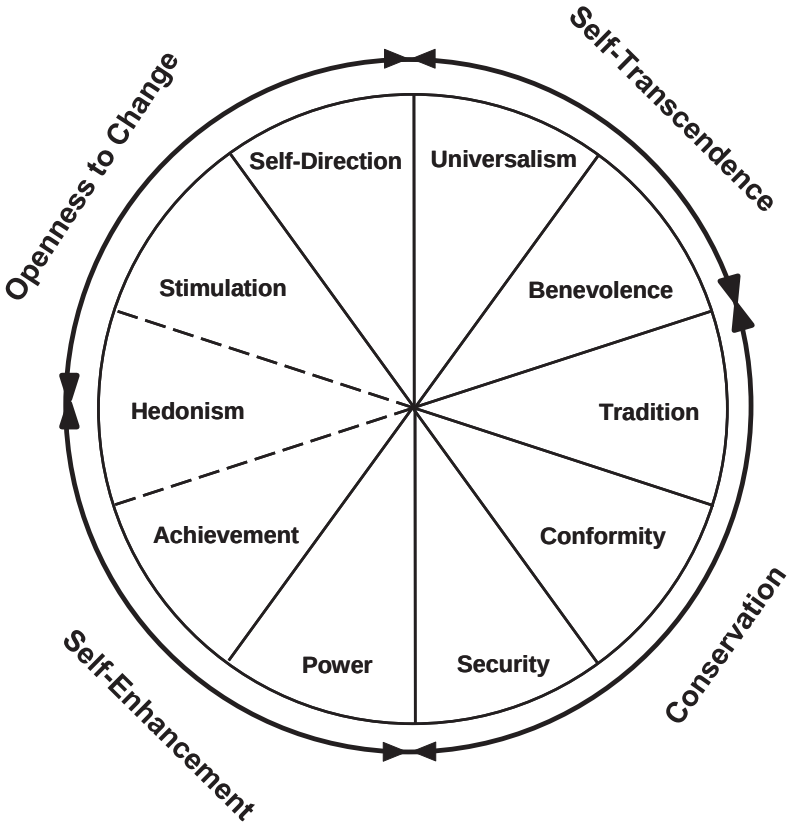

Figure 1. Schwartz (1992) original circular model of ten basic human values and the four higher order values.

1.2 Children's Values

Recently, significant progress has been made in understanding the structure of children's values. Across individuals, the circular structure of values has also been found in childhood, with almost as much differentiation as adults (e.g., Döring et al., 2012). However, younger children were more inconsistent in the ordering of values around the circle than older children (Cieciuch, Davidov, & Algesheimer, 2016; Uzefovsky, Döring, & Knafo-Noam, 2016). This evidence suggests that value development occurs in early childhood (2 to 7 years) and calls for research and instruments to assess values in early childhood.

The first longitudinal studies of children's values also shed light on the development of value priorities in childhood (Döring et al., 2016). Value priorities (i.e., how important children find each value) can be affected by individual characteristics (e.g., gender), by life experiences (e.g., growing up in a religious home), or by significant life events (e.g., immigration). These characteristics, experiences, and events also show an age trend in their influence on value priorities. For example openness to change values became more important and conservation values became less important from childhood to adolescence (Cieciuch et al., 2016). Motivational compatibilities and incompatibilities reflected in these studies are highly relevant for developmental psychology.

1.3 The measurement of children's values

Children's values have predominantly been measured using the Portrait Values Questionnaire (Schwartz, Melech, Lehmann, Burgess, Harris, & Owens, 2001: PVQ), which was designed for adults. The PVQ has been used to measure values in children as young as 10 (e.g., Bubeck & Bilsky, 2004; Döring, 2010; Knafo & Spinath, 2011; Liem, Martin, Nair, Bernado, & Prasetya, 2011). Studies using this instrument found that children's values reflect the motivational compatibilities and conflicts inherent in the four higher order values. They also found less differentiation between the 10 basic values in younger children.

Döring (2010) suggested that the lack of differentiation in children's values could be related to the complex wording of the PVQ scenarios. As a result, Döring and her colleagues (2010) developed a Picture-Based Value Survey for Children (PBVS-C). They found comparable differentiation in values to what has been found in adults, with PBVS-C data from children between 8 and 11 years old. They also found strong support for the trade-offs between Schwartz's (1992) higher order values and significant correspondence with the

ordering of the 10 basic value types. However, power and achievement were reversed and tradition was located closer to benevolence than might be expected.

Research into children's values across instruments implies that the development of a coherent structure of values is a function of age. Researchers have referred to age and stage type theories (e.g., Piaget & Inhelder, 1969), with the expectation that values would be most likely to develop in the 'formal operations stage' (i.e., 12 years to adult) or the 'concrete operations stage' (i.e., 7 to 11 years old) (Döring et al., 2015). These arguments are supported by evidence of progressively differentiated values with age across both stages (e.g., Bubeck & Bilsky, 2004; Döring, 2010; Döring et al., 2010).

While age is clearly an important factor in the development of values, it is not the only factor. For instance, Bubeck and Bilsky (2004) found gender differences in the development of values, with females showing more differentiation in their values than males. This suggests that children's value development may also differ within age groups (e.g., gender differences within age groups).

Vygotsky's socio-cultural theory (1978) is based on learning and development taking place in a social context, supporting the idea that children develop at different rates. He believed children could be taught difficult concepts effectively at any stage of development by building on their existing knowledge. Thus, based on Vygotsky's theory, a clear and differentiated values structure could develop, for at least some children, within what Piaget refers to as the pre-operational stage (2 to 7 year olds).

One obstacle to testing the development of values in young children, with existing instruments, is reading ability. To overcome this, we developed a new values instrument that incorporated verbal, visual and auditory information about each value, to maximise young children's opportunity to understand these somewhat abstract concepts.

1.4 The current research

The aim of this research was to examine the consistency and coherence of values in early childhood using a multi-sensory instrument to enhance young children's understanding of each value. Specifically, we examined whether young children make consistent choices about the importance of values when faced with multiple choice contexts (within subsets of values) and whether their values reflect Schwartz's (1992) value theory.

2. Method

2.1 Participants

The sample consisted of 329 children (47% male) between the ages of 5 and 12 years from five primary schools in Australia. Written consent was obtained from the governing bodies, school, parents and students. Children with cognitive disabilities were excluded.

2.2 Measure and procedure

2.2.1 The Animated Values Instrument

We first developed a series of 3-5 second animated scenarios that combined visual, auditory and written cues, designed to increase young children's comprehension of the values presented. In each case, the animations were designed to depict a value-expressive behaviour accompanied by a statement (auditory and written) expressed as a desirable motivational goal (see Figure S1). Specifically, we began each value statement with the text "I want to…" (e.g., "I want to be the best" for Achievement; "I want to do different and exciting things" for Stimulation), to differentiate the scenarios from traits as observed patterns of behaviour (see Bilsky & Schwartz, 1994; Roccas, Sagiv, Schwartz, & Knafo, 2002).

Each value animation was initially assessed by values experts and then tested in focus groups of young children to ensure their interpretations were consistent with the values being

presented (Collins, 2013). The animations were placed within a series of small subsets, based on best worst scaling (BWS; see Louviere, Lings, Islam, Gudergan, & Flynn, 2013).

BWS infers an individual's strength of preference from how often they choose one object or item over others (Louviere et al., 2013). This approach extends Thurstone's (1927) Random Utility Theory model for paired comparison choices to multiple choices, in which participants are asked to choose both the best (most) and worst (least) object or item in a set of three or more options (see Marley & Louviere, 2005). Thus, BWS capitalizes on the amount of information that can be captured by asking about both best and worst options. Most applications of BWS design subsets of objects or items, based on balanced experimental designs to ensure that each object, and each pair of objects, appears equally often.

This approach has several advantages over rating scales for measuring young children's values. First, selecting the most and least important item from small sets is considered easier than rating the full list of items (Marley & Louviere, 2005). Second, as respondents only choose the most and least important item from each set, they cannot use different parts of a scale, effectively removing patterning bias. Third, the BWS approach produces a set of relative values scores, which do not require post-hoc standardisation, as is the recommended practice for rating scale values instruments (see Schwartz, 1992).

We followed Louviere et al.'s (2013) recommendations for the development of the Animated Values Instrument (AVI). First, as indicated, we designed animated value scenarios for each value items (Schwartz et al, 2012; Lee et al., 2016). Next, the animated scenarios were placed within subsets based on the same balanced incomplete block experimental design used by Lee et al. (2016). This required one additional unrelated animation (in this case, focused on health) that was removed prior to the analysis of the values. This design produced 21 subsets with five animated scenarios in each set. Across all 21 subsets, each scenario appeared five times and each pair of scenarios appeared together once. Thumbnails of the

animated scenarios (Figure S1) and a screenshot of the first subset in the AVI (Figure S2) are provided as supplemental materials.

2.2.2 Procedure

A brief introduction was given prior to administering the AVI to children. This was done in the schools' computer labs in class groups for 7-12 year olds and small groups (2-5 children) for 5-6 year olds. Students completed the AVI task by dragging a yellow smiling face to the animation most like them and a red frowning face to the animation least like them, in each of 21 sets of five value animations. The survey completion time was approximately 20 minutes for older children (7-12yrs) and 30-40 minutes for younger children needing assistance with computer mouse movement (5-6yrs).

Individual children's value importance scores were calculated for each value by taking the number of times a value was chosen as "least like me" from the number of times it was chosen as "most like me". We normalized these difference scores by dividing them by five, which was the number of times each value appeared to produce an 11-point scale that ranged from -1 to +1, where zero can be interpreted as the mid-point of the latent scale. Scores above zero indicate increasing importance and scores below zero indicate decreasing importance. We also gathered information about age and gender.

2.3 Analytical Strategy

We assessed the consistency of value choices by examining the frequency of the most important and the least important value for each child. We considered value choice to be highly consistent when one value was chosen 4 or 5 out of the 5 times it appeared and still to be consistent when it was chosen 3 out of the 5 times it appeared. This is based on the Schwartz theory where neighbouring values share similar motivations. Since each pair of

values, even neighbouring values, are seen together once, a child may select a neighbouring value and still be considered to make consistent choices. We considered value choice to be inconsistent when they failed to choose any one value as most (least) important at least 3 of the 5 times they appeared.

The SPSS PROXSCAL program was used to examine the structure of values. We followed Bilsky, Janik, and Schwartz's (2011) method, using ordinal proximity transformations, Euclidian distance measures, z-score transformations of values and a custom initial configuration of 20 points around a circle to estimate the two-dimensional structure. The custom initial configuration specifies a priori which item should be placed into each region of the circle. This allowed us to test whether the theoretical ordering was mirrored in the MDS representation (i.e., the items fall into the expected place in the MDS space).

We followed Gollan and Witte's (2014) intra-individual values profile analysis to assess the fit of individuals with the circumplex model. First, we created a set of 10 ideal value profiles; one for each of Schwartz (1992) 10 basic values. These 10 ideal value profiles followed a sinusoid curve, where one value was given a score of 1, the opposing value given a score of -1 and all other values given a score that fell around the curve between those two values. Spearman's rank order correlations were computed between each child's values scores and the 10 ideal type scores to assess the extent to which their value profiles were similar to the ideal value curve. We first calculated the 10 basic value types from the value items, following Schwartz et al. (2012). The highest of the 10 correlations indicates which ideal type curve fits the profile best and how good the fit is with the sinusoidal shape. Gollan and Witte (2014) used the rule of thumb that a cutoff value of $r_s < .50$ distinguishes between profiles that are well represented by the circumplex structure and those that are poorly represented.

3. Results

3.1 Descriptive statistics

The means, standard deviations and the minimum and maximum value importance scores from the AVI data are presented in Table 1. Subscripts in column 2 identify means that are not significantly different from one another.

Table 1. Means and standard deviations of 20 value items from the AVI

Value facets	Mean	Standard deviation	Minimum	Maximum
Benevolence-caring	$.28_{a}$	.33	-.8	1.0
Universalism-animals	$.27_{a}$	.38	-.8	1.0
Security-societal	$.20_{b}$	.34	-1.0	1.0
Stimulation	$.19_{b}$	.40	-.8	1.0
Universalism-concern	$.17_{b}$	.38	-.8	1.0
Benevolence-dependability	$.16_{bc}$	.34	-1.0	1.0
Security-personal	$.13_{cd}$	.30	-1.0	1.0
Universalism-nature	$.10_{de}$	.31	-.8	1.0
Universalism-tolerance	$.08_{def}$	.34	-.8	1.0
Conformity-rules	$.05_{efg}$	.41	-1.0	1.0
Self-Direction-thought	$.03_{fgh}$	.42	-.8	1.0
Conformity-interpersonal	$.00_{gh}$	.34	-1.0	.8
Tradition	$-.01_{hi}$	.33	-.8	1.0
Hedonism	$-.08_{ij}$	.54	-1.0	1.0
Face	$-.11_{j}$	.36	-1.0	1.0
Self-Direction-action	$-.13_{j}$	.29	-1.0	.6
Achievement	$-.23_{k}$	.51	-1.0	1.0
Power-resources	$-.24_{k}$	.51	-1.0	1.0
Humility	$-.27_{k}$	.40	-1.0	.8
Power-dominance	$-.47_{l}$	.35	-1.0	.6

Note: The same subscripts in the column indicate means are not significantly different from each other at the $p < .05$ level.

Overall, the most important value items were Benevolence-Caring (m = .28) and Universalism-Animals (m = .27), which were not significantly different to each other (t = .25, p = .80). At the other end of the scale Power-dominance (m = -.47) was the least important

value, being significantly less important than the next least important value item (Humility m= -.27; $t = 6.92$, $p < .001$). The standard deviations for the values in Table 1 range from .54 for Hedonism to .29 for Self-Direction-action, which shows clear variation in children's value priorities. The maximum scores show that for all 20 value items, at least one child chose it as most like them three or more of the five times it appeared; and the minimum scores show that for all 20 value items, at least one child chose it as least like them four or more of the five times that it appeared.

3.2 Consistency of choice

Figure 2a shows the consistency of children's choices for their most important value by age group. Older children (10+) were all consistent in their value choices. A high level of consistency was achieved by 80% of 10 to 12 year olds, 69% of 7 to 9 year olds, 62% of 6 year olds and 40% of 5 year olds. Very few children were inconsistent in their choices. Specifically, only 13% of 5 year olds, 8% of 6 year olds, and less than 5% of 7-9 year olds were inconsistent in their most important values choices.

Similarly, Figure 2b shows the consistency of children's choices for their least important value by age group. We found children aged seven and above were all consistent in their value choices. A high level of consistency was achieved by 90% of 10 to 12 year olds, 80% of 7 to 9 year olds, 57% of the 6 year olds and 47% of the 5 year olds. Very few children were inconsistent in their choices. Specifically, only 10% of 5 and 6 year olds were inconsistent in their least important values choices.

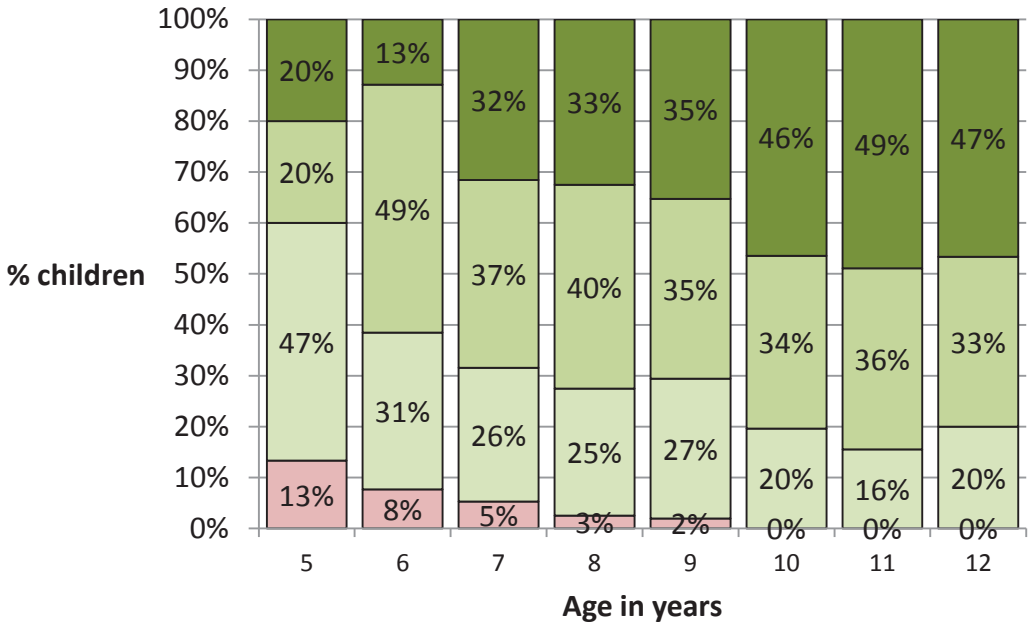

Figure 2a: Consistency of choices by age for most important values

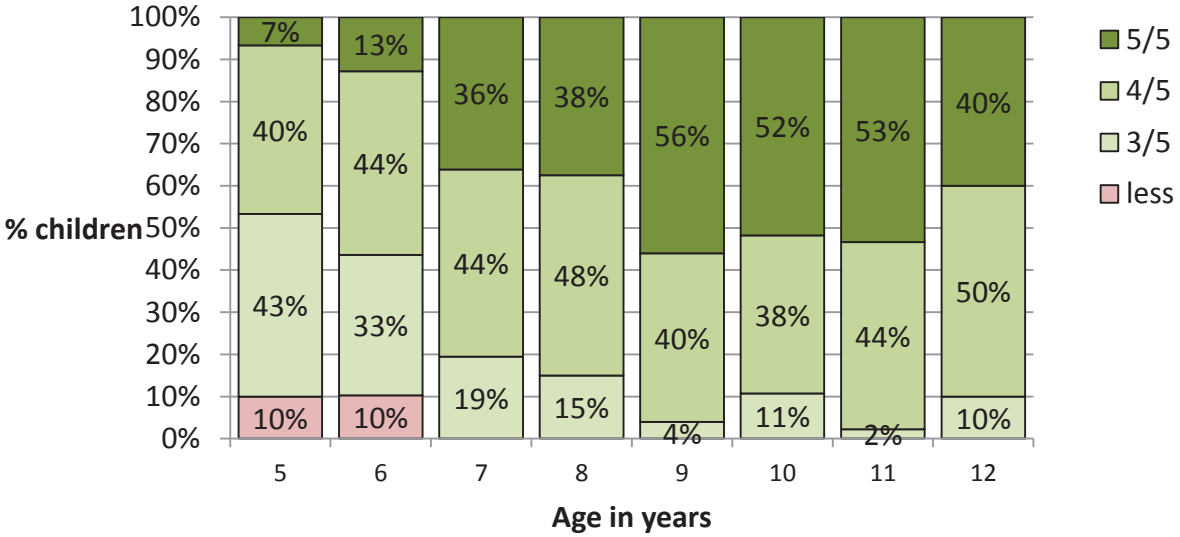

Figure 2b: Consistency of choices by age for least important values

3.3 Values structures

The values structure shown in Figure 3, based on multidimensional scaling (MDS) analysis, closely follows Schwartz's theory. The MDS plot represents the associations among the items well (Kruskal's Stress 1 measure was .16 and the dispersion was .98). The location of the

value items around the circle corresponds to the theoretical order for Schwartz's (1992) higher order values, with only 2 minor (neighbouring) deviations. Tradition and conformity–rules were both located within the self-transcendence higher order region, rather than the conservation region.

[insert Figure 3 about here]

3.4 Fit with the circumplex model

We correlated each child's value profile with the ideal type curves (see Table S1, supplemental materials). In Figure 4, we present an example of the value profiles of children who best fit the ideal type curves for two dissimilar values (benevolence and achievement). Children who showed a high correlation with the ideal type curve for benevolence (Figure 4a) clearly placed a higher importance on this and its neighbouring values and far less importance on the opposing value of achievement and its neighbouring values. Similarly, children who showed a high correlation with the ideal type curve for achievement (Figure 4b) placed a higher importance on this and its neighbouring values and far less importance on the opposing value of benevolence and its neighbouring values. This clearly shows strong correspondence to the ideal type curves for these children, including some 5 and 6 year olds.

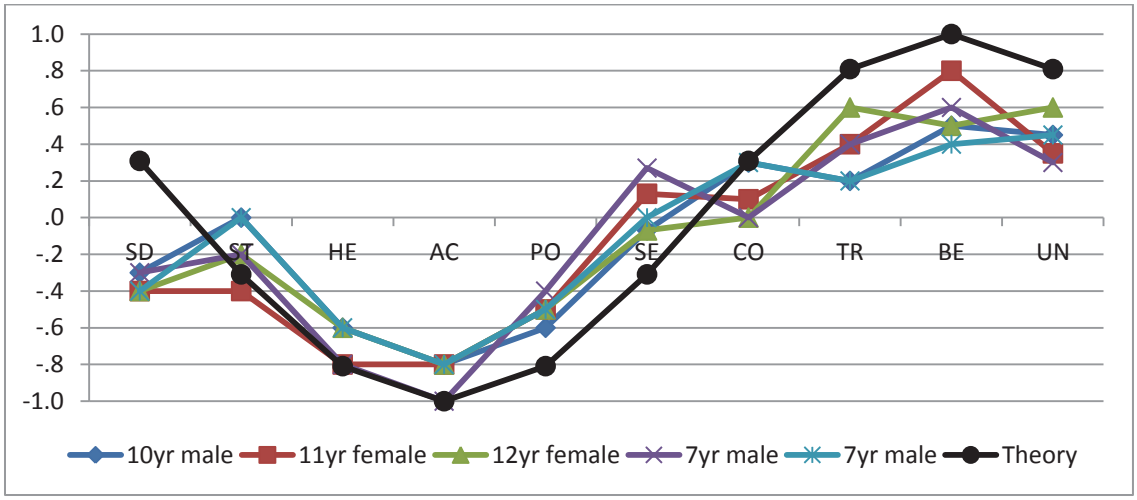

Figure 4a. Children highly correlated (r > .8) with the ideal type curve for Benevolence

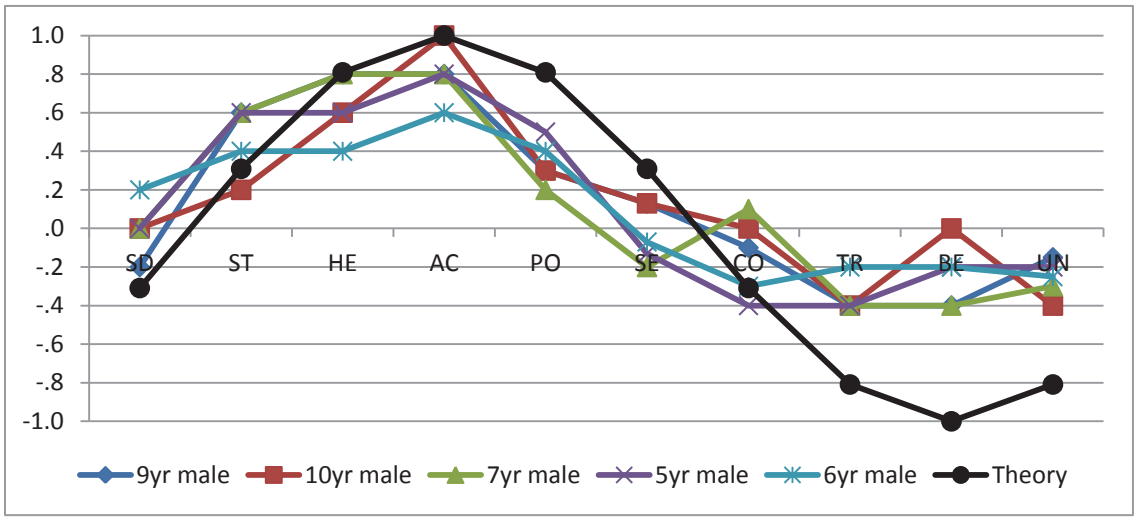

Figure 4b: Children highly correlated (r >.8) with the ideal type curve for Achievement.

Across the entire sample the average of all maximum correlations with the ideal type curves was r_s = .58, with a median r_s = .60. This compares favourably with Gollan and Witte's (2014) adult sample (r_s = .61) and is well above random chance (r_s = .49; cited in Borg et al., 2015). While there appears to be no clear and consistent pattern by age in the mean or median maximum correlations (see Table 2), a lower proportion of children in younger ages show a good fit (r_s > .50) to the circumplex model as can be seen in column 6.

Table 2. Median, mean and standard deviation for the maximum correlations with the ideal type curves by age.

Age	N	Median	Mean	Standard Deviation	Percentage $r_s > .50$
5	30	.52	.52	.27	53%
6	39	.65	.60	.21	64%
7	38	.55	.57	.23	61%
8	40	.58	.59	.20	65%
9	51	.64	.57	.22	63%
10	56	.63	.61	.19	73%
11	45	.57	.58	.21	64%
12	30	.67	.64	.16	80%

4. Discussion

Our aim was to examine the consistency and coherence of values in early childhood. Our results indicate data collected with the AVI showed strong consistency in value choice in young children. Specifically, 100% of 10-12 year olds, 95% of 7-9 year olds and 87% of 5-6 year olds made consistent values choices across both the most and least important choices. This is the first evidence of clear differences in the ability of young children to comprehend and express values. It offers support for the proposition that value development occurs in early childhood (e.g., Uzefovsky et al., 2016). However, the current study relies on cross-sectional data. Future longitudinal studies are needed to examine value development in young children.

The finding that almost half of the youngest age group were highly consistent in their values choices provides evidence that age and stage theories (e.g., Piaget & Inhelder, 1969) do not fully account for the development of values. Individual differences within age groups, might also be explained by Vygotsky's (1978) socio-cultural theory of development. In his theory, language development and social interactions are central to understanding how children develop and comprehend complex and abstract concepts at a young age. Although

theories of age and stage have been central to children's values research to date, the importance of socialisation in the development of value priorities is gaining some acceptance in the children's values literature (e.g., Cieciuch et al., 2016). Further research is needed to examine this and other explanations, such as cognitive ability.

We show, for the first time, that the data from young children conform to Schwartz's (1992) structure at the sample and individual level. Findings from MDS analysis are consistent with previous research findings from middle-childhood and adolescence (e.g., Blisky et al., 2005; Bubeck & Bilsky, 2004; Cieciuch et al., 2013; Doring et al., 2010; Liem et al., 2011). We extend this literature, finding intra-individual consistency with the circular structure that is at least as strong as what has been found in adults (e.g., Gollan & Witte, 2014). While more than half of the children in each age group showed a correlation above $r > 0.5$, the proportion clearly increases with age. Future studies are needed to move beyond consistency with the theory to examine consistency with other instruments and other potential indicators of value systems (e.g., value-expressive behaviours).

5. Limitations and Conclusions

Consistent with previous studies the four higher order and 10 basic values were clearly distinguished and reflect the theoretical ordering. However, tradition and conformity-rules were located in the neighbouring self-transcendence region. The mislocation of these value items is similar to other studies of children's values (e.g., Bubeck & Bilsky, 2004; Cieciuch, et al., 2016; Döring et al., 2010; Liem et al., 2011; Uzefovsky, et al., 2016). The mislocation of tradition and conformity-rules is considered a small deviation as these value items express similar motivations to benevolence in young children (see also Cieciuch et al., 2016).

Although the attention span of younger children was not directly tested, anecdotal evidence indicates that for some of the younger children the length of time taken (sometimes up to 40 minutes due to limited gross motor skill development, using a mouse, and

experience of completing a survey) may have impacted on their interest in completing the survey. Also, for the youngest children in the study, the considerable developmental differences in the range of what is expected both linguistically and cognitively at this age may impair the ability of some children to understand and communicate their values. These developmental issues require further investigation. Further, the AVI should be tested in more diverse samples of children, including those from other cultures.

The BWS approach that underlies the AVI is a forced-choice instrument. Forced-choice instruments produce relative scores that have ipsative qualities. However, this is compatible with Schwartz's (2003) recommendation to standardise each value score by subtracting the mean of all of the value items creates relative scores. There may also be an advantage to measuring relative scores directly, rather than using post hoc standardisation (Lee et al., 2016). Further, the BWS approach is considered easier for respondents than answering long lists of rating scales. It also allowed us to examine the consistency of choice for the first time.

In conclusion, we found the majority of young children to be consistent in their values choices and coherent in their structure at both the sample and individual level for the first time. Further, the AVI adds to the range of values instruments that can be used to measure children's values, allowing researchers to examine values in very young children.

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Figure(s)

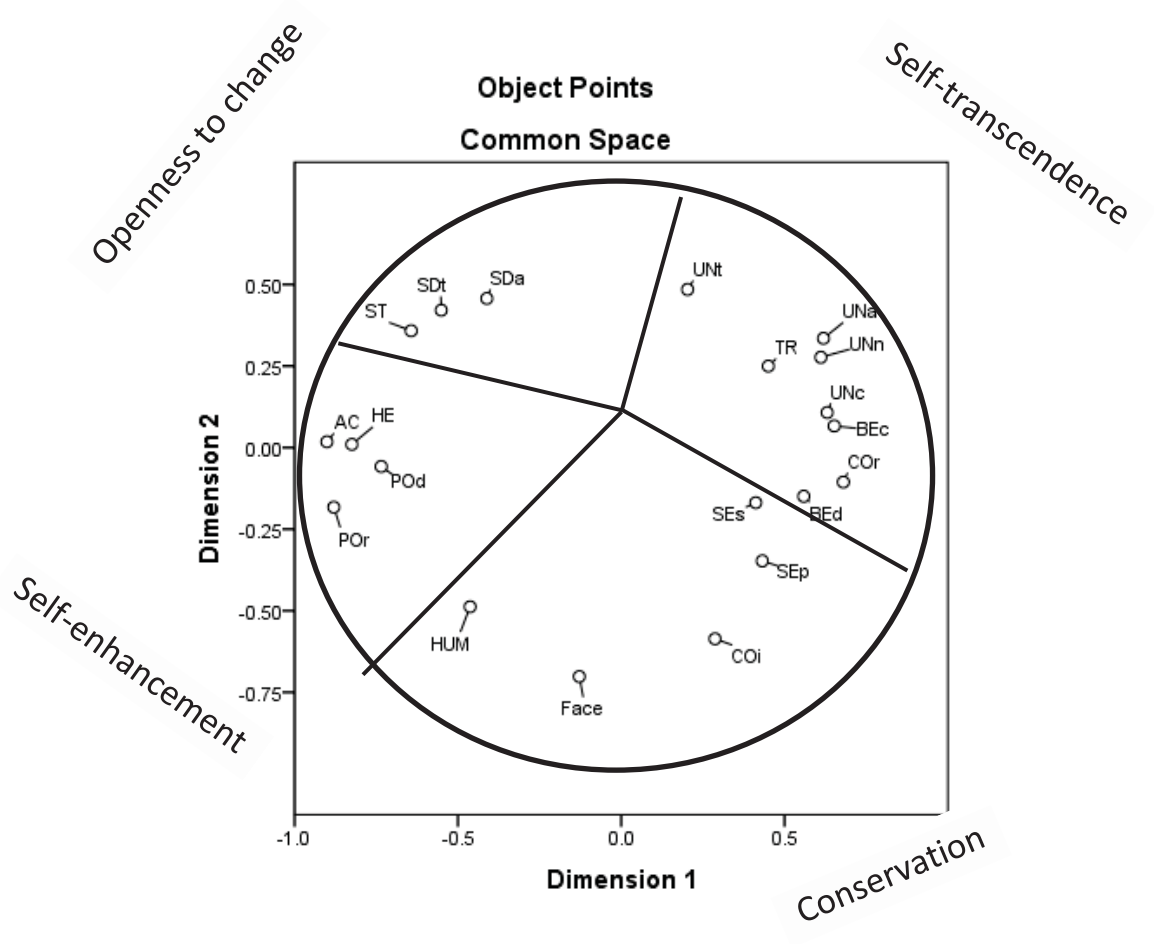

Figure 3. MDS of the refined value facets (Stress 1 = .16).

Note. Abbreviations are as follows: SDt, Self-direction-thought; SDa, Self-direction-actions; ST, Stimulation; HE, Hedonism; AC, Achievement; POd, Power-dominance; POr, Power-resources; FAC, Face; SEp, Security-personal; SEs, Security-social; TR, Tradition; COr, Conformity-rules; COi, Conformity-interpersonal; HU, Humility; BEd, Benevolence-dependability; BEc, Benevolence-caring; UNc, Universalism-concern; UNn, Universalism-nature; UnA, Universalism-animals; UNt, Universalism-tolerance.

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Supplementary Material

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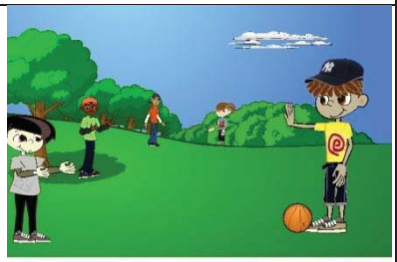
Supplemental Materials

Universalism (societal)	Universalism (nature)	Universalism (animals)
 I want to help people who have less than me.	 I want to care for the natural environment.	 I want to protect animals from harm.
Univeralism (tolerance)	**Self-direction (thought)**	**Self-direction (action)**
 I want to make friends with people who are different to me.	 I want to discover new things.	 I want to choose for myself.
Stimulation	**Hedonism**	**Acheivement**
 I want to do different and exciting things.	 I want to relax and enjoy myself.	 I want to be the best.
Power (resources)	**Power (dominance)**	**Face**
 I want to be rich and powerful.	 I want to tell other people what to do.	 I want to avoid being shamed or embarrassed.
Security (personal)	**Unrelated item (removed)**	**Security (societal)**
 I want to feel safe and secure.	 I want to avoid getting sick.	 I want my community to be a safe place.

Tradition	Conformity (rules)	Conformity (interpersonal)
		
Humility	**Benevolence (dependability)**	**Benevolence (caring)**
		

Figure S1: Thumbnails of the animated scenarios.

Figure S2: Screenshot of the first subset from the Animated Values Instrument (AVI).

Table S1.

Theoretical location of values around the circumplex for each value type.

	Theoretical Structures									
	Universalism	Benevolence	Tradition	Conformity	Security	Power	Achievement	hedonism	Stimulation	Self Direction
Self Direction	0.81	0.31	-0.31	-0.81	-1.00	-0.81	-0.31	0.31	0.81	1.00
Stimulation	0.31	-0.31	-0.81	-1.00	-0.81	-0.31	0.31	0.81	1.00	0.81
Hedonism	-0.31	-0.81	-1.00	-0.81	-0.31	0.31	0.81	1.00	0.81	0.31
Achievement	-0.81	-1.00	-0.81	-0.31	0.31	0.81	1.00	0.81	0.31	-0.31
Power	-1.00	-0.81	-0.31	0.31	0.81	1.00	0.81	0.31	-0.31	-0.81
Security	-0.81	-0.31	0.31	0.81	1.00	0.81	0.31	-0.31	-0.81	-1.00
Conformity	-0.31	0.31	0.81	1.00	0.81	0.31	-0.31	-0.81	-1.00	-0.81
Tradition	0.31	0.81	1.00	0.81	0.31	-0.31	-0.81	-1.00	-0.81	-0.31
Benevolence	0.81	1.00	0.81	0.31	-0.31	-0.81	-1.00	-0.81	-0.31	0.31
Universalism	1.00	0.81	0.31	-0.31	-0.81	-1.00	-0.81	-0.31	0.31	0.81