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ORIGINAL PAPER

Validating the Short Material Values Scale for Children for Use Across the Lifespan

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Abstract

Background Materialism is a topic of interest for many scholars. Among children it is often measured with the Material Values Scale for children (MVS-c) (Opree et al. in Personal Individ Differ 51(8):963–968, 2011). Although the MVS-c was originally validated for use among 8- to 12-year-olds, its 6-item version is increasingly implemented among older populations (i.e., adolescents and emerging adults).

Objective The aim of the current study is to verify whether the 6-item MVS-c can be employed among older populations and used for the analysis of materialism across the lifespan.

Method The 6-item MVS-c is administered to children in middle childhood (ages 8–12; $n=2995$), adolescents (ages 15–17; $n=267$), emerging adults (ages 18–21; $n=267$), and adult parents (ages 25+; $n=2995$). Its factorial structure, reliability, and validity are assessed and compared. Particular attention is paid to the scale's metric and scalar invariance.

Results The results suggest that the 6-item MVS-c can be reliably and validly used across the different age groups. By showing metric invariance and (partial) scalar invariance using multigroup structural equation modeling, we demonstrate that it is possible to use the 6-item MVS-c to compare materialism scores and to study the predictors and outcomes of materialism across all four age groups.

Conclusions The findings suggest that the MVS-c can be used to track children's materialism and investigate its associated causes and consequences across different developmental phases.

Keywords MVS-c · Scale validation · Metric and scalar invariance · Lifespan · Materialism

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Introduction

The Material Values Scale for children (MVS-c) was first introduced in 2011 (Opree et al. 2011). Though used in a variety of disciplines including developmental psychology, sociology, and marketing (e.g., Jiang et al. 2015; Opree and Kühne 2016), the MVS-c is mainly applied within the field of communication studies—more particularly to study the effects of advertising on children's feelings of longing and belonging (e.g., Hudders et al. 2016; Opree et al. 2012, 2014). The MVS-c has three versions, the full-length 18-item version and two shorter versions consisting of six and three items respectively, and it has been validated for use among children between the ages of 8 and 12 (Opree et al. 2011).

Recently, researchers have started applying the MVS-c to other age groups than it was originally intended for. Jiang et al. (2015) used the 6-item MVS-c among a Chinese sample of 12- to 16-year-olds and Opree and Kühne (2016) used the 6-item MVS-c among two Dutch samples of 15- to 17-year-olds and 18- to 21-year-olds. Both teams of authors found high levels of internal consistency for the MVS-c. Jiang et al. (2015) reported a Cronbach's alpha of .85, and Opree and Kühne (2016) reported alphas of .93 and .88. Although these findings suggest that the 6-item MVS-c can be implemented among older age groups, this conclusion cannot be substantiated without looking at its factorial structure (DeVellis 2016).

Soni and Behal (2015) were the first to test—and confirm—the factorial structure of the MVS-c among adolescents and emerging adults, doing so among an Indian sample of 15- to 24-year-olds. Their work adheres to the call of the original authors to validate the MVS-c for use among adolescents (Opree et al. 2011), yet suffers from two major limitations. First, adolescents (i.e., teens younger than 18) and emerging adults (i.e., youth in their late teens and early twenties) were treated as one homogenous group, whereas they cannot due to their distinctive developmental features (Arnett 2015). Second, Soni and Behal (2015) did not assess whether the loadings and intercepts of the MSV-c's individual items were comparable to those found among children. Granted, assessing metric and scalar variance was and remains a rare practice (Kühne 2013; Vandenberg and Lance 2000; Yoo 2002). Yet, this is crucial in establishing whether or not the construct of interest (e.g., materialism) has the same meaning across populations (Steinmetz et al. 2009). In fact, when making age group comparisons, metric invariance is required to compare relationships between constructs and scalar invariance is a prerequisite to comparing the means (Steenkamp and Baumgartner 1998; Steinmetz et al. 2009).

Opree et al. (2011) suggested that the MVS-c should be validated across different age populations, because this would allow for greater "insight into the general development of children's materialism and its associated causes and consequences at different ages" (p. 967). Importantly, validating the MVS-c across different age populations would enable age comparisons to be made cross-sectionally (i.e., by administering the MVS-c to different age groups at the same point in time), and also longitudinally (i.e., by administering the MVS-c to the same group at different ages). Admittedly, some important developmental insights were already uncovered by Chaplin and John (2007) and Jaspers and Pieters (2016), who mapped fluctuations in materialism among 8- to 18-year-olds and 16- to 90-year-olds respectively. The collage method by Chaplin and John (2007), however, cannot be used in survey research among adults and, vice versa, the Material Values Scale (MVS, Richins and Dawson 1992) employed by Jaspers and Pieters (2016)

cannot be used in survey research among children. Though Chaplin and John (2007) have demonstrated that materialism scores obtained through collages and surveys are highly comparable ($r = .88$, see p. 486), the match in scores is not perfect, preventing a full one-on-one comparison.

The aforementioned studies have indicated that materialism increases between middle childhood and early adolescence (i.e., from the ages 8–9 to the ages 12–13), decreases between early and late adolescence (i.e., from 12–13 to 16–18) (Chaplin and John 2007), and continues to decrease until the age of 56, after which it gradually increases again (Jaspers and Pieters 2016). Interestingly, the heightened materialism of both young adolescents and seniors is attributed to an increased need for self-enhancement due to decreased self-esteem caused by body and social insecurity and/or anxiety (Chaplin and John 2007; Jaspers and Pieters 2016). Still, birds of a feather tend to flock together, and Chaplin and John (2007) mention the family and peer environment as important facilitators of materialism too. Validating the MVS-c for different age populations would enable scholars to test the social ecology perspective of Bronfenbrenner (2009), and to compare children's materialism with that of their parents, siblings, and peers.

Gaining knowledge about the development and causes of materialism is important given it consequences. Academic and societal concerns about the impact of consumer culture and children's materialism are rising (Buckingham 2011; Dávila et al. 2017; Opree 2014). The current generation of youth is exposed to more advertising (Atkinson et al. 2015) and perceived as more materialistic and entitled than any generation before (Twenge 2006), and many worry that the short-time thrills of conspicuous consumption (Hudders and Pandelaere 2012; Richins 2013) leave youth at future risk for excessive spending tendencies and debt (Garðarsdóttir and Dittmar 2012; Richins 2011; Watson 2007) as well as decreased life satisfaction (Tsang et al. 2014). Though it is a common assumption that materialistic children will grow up to be materialistic adults, this assumption is actually yet to be empirically tested. Research needs to disentangle if, when, and why materialism peaks in order to create proper interventions.

Given the need for a measure of materialism that is validated across the lifespan and limitations of existing measurement approaches, this study aims at testing the suitability of the 6-item MVS-c for comparisons across age groups and, thus, at extending the realm of possible applications of the scale. More specifically, we evaluate the factorial structure, metric and scalar invariance, reliability, and construct validity of the 6-item MVS-c among children in middle childhood (ages 8–11), adolescents (ages 15–17), emerging adults (ages 18–21), and adult parents (ages 25+).

Based on the reviewed research, which has established the validity and/or reliability of the 6-item MVS-c among young age groups (e.g., Opree et al. 2011; Jiang et al. 2015), we expect the following consistent pattern of results across the four age groups. First, in each age group, we expect the indicators of the 6-item MVS-c to have significant positive loadings on a latent factor in a confirmatory factor analysis and, respectively, the latent factor to explain a substantial amount of the indicators' total variance (*factorial validity hypothesis*) (Byrne 2010). Second, we expect the factor loadings of like indicators to be the same across age groups (*metric invariance hypothesis*) (Steenkamp and Baumgartner 1998). Third, we expect the intercepts of like indicators to be the same across age groups (*scalar invariance hypothesis*) (Steenkamp and Baumgartner 1998). Fourth, we expect the six indicators of the MVS-c to be reliable and, accordingly, internally consistent in each age group (*reliability hypothesis*). Fifth, we expect the 6-item MVS-c to be significantly correlated with concepts from the nomological network of materialism (*construct validity*

hypothesis) (DeVellis 2016). The specific theoretical relationships that are used the evaluate the MVS-c's validity are discussed in the next section.

General Method

In this section, we outline the general method and data analytical strategy that was employed to validate the 6-item MVS-c. The validation is based on data from two studies, and their designs are discussed in separate methods sections below (see sections "Study 1" and "Study 2").

Overview

The MVS-c is essentially an adaptation of Richins and Dawson's (1992) Material Values Scale (MVS). Both scales contain three sub dimensions, capturing (1) Material Centrality, the importance attributed to the acquisition of possessions, (2) Material Happiness, the expected benefits of the acquisition of possessions in terms of happiness, and (3) Material Success, the expected benefits of the acquisition of possessions in terms of success and popularity (Opree et al. 2011; Richins and Dawson 1992). The full-length MVS-c scale includes 18 items (i.e., six items per dimension), but two short versions which include six and three items respectively have been developed too (i.e., with respectively two and one item per dimension; see Opree et al. 2011). The 6-item MVS-c was chosen for validation for two reasons. First, compared to the 18-item version, the 6-item versions can more easily be combined with other measurements in a questionnaire, which is especially important when conducting research with children for whom questionnaires need to be short due to their limited attention span. Second, we prefer the 6-item over the even shorter 3-item MVS-c scale due to its superior reliability (Opree et al. 2011).

Procedure

To validate the 6-item MVS-c across the lifespan—that is, for individuals between 8 and 67 years old—, we used data from two online survey studies. In the first study, the MVS-c was administered to a sample of children (ages 8–12) and their parents (ages 25 and up). In the second study, the MVS-c was administered to a sample of adolescents (ages 15–17) and emerging adults (ages 18–21). Both studies were conducted in one and the same country which eliminates culture as confounding feature in the age group comparisons (Yoo 2002). The original items of the MVS-c (see Appendix A of Opree et al. 2011) were used, with one minor adaptation: The original Dutch items of the MVS-c contained diminutives for referring to children's friends (i.e., *vriendjes* for male friends and *vriendinnetjes* for female friends). For the older populations, these diminutives were replaced by "neutral" alternatives (i.e., *vrienden* from male friends and *vriendinnen* for female friends).

Data Analysis

An identical analytical strategy was applied to both datasets. Do note, however, that because the two studies were part of larger research projects, we could not employ exactly

the same set of measures for the construct validation of the 6-item MVS-c in both studies (see specific method sections below). We revisit this point in the discussion.

Multigroup Confirmatory Factor Analysis

We conducted a multigroup analysis using structural equation modeling in Mplus 6 to estimate three models. The first model, the baseline model, was a confirmatory factor analysis of the 6-item MVS-c. This model was used to assess the factor loadings of the 6-item MVS-c's indicators and, thus, to evaluate the factorial validity hypothesis. The second model, the metric invariance model, was identical to the baseline model except that the loadings of like indicators were constrained to be equal across groups. The third model, the scalar invariance model, was identical to the metric variance model except that the intercepts of like indicators were constrained to be equal too. We compared the fit of the metric invariance model to the fit of the baseline model, and the fit of the scalar invariance model to the fit of the metric invariance model. If model fit does not decrease after imposing additional equality constraints, this indicates that metric or, respectively, scalar invariance exists (Kühne 2013). Accordingly, the model comparisons were used to test the metric invariance and the scalar invariance hypotheses.

The fit of the baseline model was assessed by inspecting the comparative fit index (CFI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). We focused on these indices because, unlike the Chi-square test, they are not affected by large sample sizes (Fan, Thompson, and Wang 1999; Kline 2011). An acceptable model fit is indicated by a CFI larger than .90, an RMSEA smaller than .08 and an SRMR smaller than .10 (Byrne 2010). The comparisons of model fit were based on the inspection of changes in the CFI, RMSEA, and SRMR, which have been demonstrated to be valid statistics for model comparisons even when sample sizes are large (Chen 2007). Because a high CFI indicates a good model fit, a substantial *decrease* in CFI suggests a decrease in model fit. In contrast, a low RMSEA and SRMR indicate a good model fit. Thus, a substantial *increase* in the RMSEA and SRMR suggest a decrease in model fit. Metric invariance is indicated by a $\Delta CFI \geq -.005$ (i.e., the change in the CFI does not lie below $-.005$) and $\Delta RMSEA \leq .010$, and $\Delta SRMR \leq .025$. To evaluate scalar invariance, the same cut-offs for changes in the CFI and RMSEA are employed, but a more restrictive cut-off for changes in the SRMR, because the SRMR is less sensitive to the noninvariance in intercepts. Scalar invariance is implied by a $\Delta SRMR \leq .005$ (Chen 2007).

The aforementioned analytical strategy was completed for each study separately (i.e., children and adult parents in Study 1, and adolescents and emerging adults in Study 2). In addition, as a preliminary analysis, the two data sets were also merged to simultaneously assess whether the factor loadings and intercepts of the 6-item MVS-c's indicators are the same across the four age groups (i.e., children, adolescents, emerging adults, and adult parents). If metric and scalar invariance hold, we may assume that the 6-item MVS-c can be used across the lifespan.

Reliability and Construct Validity

We evaluated the reliability and validity of the 6-item MVS-c in each age group—mimicking the approach of Opree et al. (2011). To assess the reliability hypothesis, we calculated the scale's internal consistency in SPSS (Cronbach's alpha). Generally, values above .70

are considered acceptable (DeVellis 2016). The validity hypothesis was tested by inspecting correlations between the MVS-c (i.e., the mean of the six indicators) and a series of theoretically related variables. If the MVS-c is correctly associated with the concepts mentioned next, this is indicative of high construct validity (Bryman 2012; DeVellis 2016). In all four samples, we determined whether the MVS-c was correlated with gender, age, and life satisfaction.

Gender was also included as an indicator of construct validity by Opree et al. (2011), who found that boys were slightly more materialistic than girls. Still, overall, the findings with regard to gender have been inconclusive: Most scholars found boys/men to be more materialistic than girls/women, but there are also several scholars who found no gender differences, and a few who found that girls/women are actually more materialistic than boys/men (for a detailed overview of these contradictory studies both across and within age groups, see Karabati and Cemalcilar 2005, and Kilbourne and LaForge 2010). This makes it impossible to formulate clear expectations regarding the relation between materialism and gender in the four different age groups. However, it seems plausible that this relation would either be absent or small in size.

Please mind that Opree et al. (2011) did not include age as a validation criterion, because of the narrow age range of their study participants (i.e., 4 years). Given the narrow age range of our children, adolescents, and emerging adults, we would also expect to find no or only marginal age differences in materialism. Still, materialism tends to increase early in life, reach a tipping point, and then decrease throughout adolescence and adulthood (Chaplin and John 2007; Jaspers and Pieters 2016). Hence, if we do find age effects for the younger populations, we expect them to be positive for children, and negative for adolescents and emerging adults. For the adult parents, the age range in our sample is broad and we, therefore, expect to be able to replicate previous findings that materialism decreases with age.

Life satisfaction was included as an indicator of construct validity by Opree et al. (2011), and was found to be negatively associated with materialism. Generally, materialism is believed to decrease life satisfaction because material desires become insatiable and, accordingly, the gap between the current and desired state is persistent and ever growing; and because materialists put a higher focus on possession and a lower focus on interpersonal relationships which are important to experiencing happiness (also described in the escalation hypothesis, adaptation hypothesis, and displacement hypothesis; see Opree et al. 2011). It must be added, though, that a two-way causality has been found among adults (with increased materialism leading to decreased life satisfaction, and decreased life satisfaction leading to increased materialism), but that longitudinal research among children between the ages of 8 and 12 has indicated that materialism is predicted by but not a predictor of children's decreased life satisfaction (Opree et al. 2012). Follow-up research showed that children use possessions as a coping mechanism for distress (Opree et al. 2018).

In addition to the common variables for all four samples, there were two extra validation measures for the child sample, and three extra validation measures for the adolescent and emerging adult samples. For the child sample, we—like the original authors—determined whether the MVS-c was correlated with normative and informational peer group influence. Based on the findings and explanation of Opree et al. (2011), we expected to find a positive relationship between materialism, on the one hand, and normative and informational peer group influence, on the other hand, because materialistic children tend to be insecure and seek affiliation and affirmation. In addition, in the adolescent and emerging adult samples, the MVS-c was correlated with happiness with possessions, narcissism, and entitlement. Neither of these variables was included in the original MVS-c validation study. Previous

Table 1 Expected correlations between the 6-Item MVS-c and related concepts

Concept	Expected relationship
Age	Absent or small positive correlation among children; absent or small negative correlation among adolescents and emerging adults; negative correlation among adult parents
Gender	Absent or small correlation in all age groups
Life satisfaction	Negative correlation in all age groups
Normative peer group influence	Positive correlation among children
Informational peer group influence	Positive correlation among children
Happiness with possessions	Positive correlation among adolescents and emerging adults
Narcissism	Positive correlation among adolescents and emerging adults
Entitlement	Positive correlation among adolescents and emerging adults

insights, however, indicate that materialism is associated with a decrease in satisfaction with money and possessions (e.g., Roberts and Clement 2007), and an increase in narcissism and entitlement (Twenge 2006; Twenge and Campbell 2009). The expected correlations between the 6-item MVS-c and the related concepts are summarized in Table 1.

Study 1

Method

Participants

An online-survey was administered to children aged 8–12 and one of their parents. The data was collected in January and February 2013. A research company that specializes in research among children was commissioned with the data collection, which enabled us to reach a large number of participants in an adequate period of time. The respondents were recruited through an existing online youth panel that is representative of the Netherlands in terms of age, gender, and geographical and socio-economic distribution. Because the study was part of a broader project on the effects of advertising on children's consumer values and happiness (viz., Opree et al. 2016), the survey included several measures on media use, values, and socio-demographics. Completing the questionnaire took approximately 15 min. Children received a small incentive for their participation. Prior to the start of the study, informed consent was obtained from the participating parent and the child. The data collection was granted IRB approval. In total, 2995 children (47% female; $M_{age} = 9.93$, $SD_{age} = 1.39$) and 2995 parents (68% female; aged 25–67; $M_{age} = 41.74$, $SD_{age} = 6.15$) filled in all questions which are relevant for our structural equation modeling analyses.

Measures

In the survey, the 6-item MVS-c (Opree et al. 2011) was administered to both children and their parents. The short version includes six indicators with response categories ranging from 1 (not at all) to 4 (very much): (1) "Do you think it's important to own expensive things?", (2) "Do you think it's important to own expensive brands?", (3) "Does buying

expensive things make you happy?", (4) "Would you be happier if you owned more clothes that are expensive?", (5) "Do you like children/people who have expensive things more than you like other children/people?", and (6) "Do you like children/people who have a lot of things more than you like other children/people?". The indicators were averaged to form a materialism scale ($M_{children} = 1.92$, $SD_{children} = .61$; $M_{\text{parents}} = 1.70$, $SD_{\text{parents}} = .52$).

To assess the validity of the 6-item MVS-c, gender (1 = male, 2 = female), age, and life satisfaction were measured in both the child and the adult parent samples. To measure children's life satisfaction, we used an adapted version of the Student Life Satisfaction Scale by Huebner (1994) (see Buijzen and Valkenburg 2003). Children were asked: "How happy are you with…" (1) "your life", (2) "your home", (3) "your parents", (4) "your friends", (5) "your class", (6) "your school", and (7) "yourself" and (8) "How happy are you?" with response categories ranging from 1 (not happy) to 4 (very happy). The scores on the eight items were averaged to form a total score of life satisfaction ($\alpha = .89$, $M = 3.22$, $SD = .46$). Parents' life satisfaction was measured with a single item: "On a scale from 1 to 10, how happy are you overall?" with response categories ranging from 1 (very dissatisfied) to 10 (very satisfied) ($M = 7.56$, $SD = 1.38$). Single-item measures have been demonstrated to validly assess life satisfaction (Cheung and Lucas 2014) and they are regularly employed (Veenhoven 2015). In total, 41 parents did not indicate their life satisfaction.

Additionally, children's susceptibility to peer group influence in consumer matters was measured to further validate the 6-item MVS-c. Children's susceptibility to peer group influence was measured with an adapted version of Mangleburg and Bristol's (1998) scale on susceptibility to peer group influence (see Opree et al. 2011). In line with earlier work by Bearden et al. (1989) the scale included two dimensions: The susceptibility to normative peer group influence (i.e., the willingness to conform to the expectations of others regarding purchase decisions) and the susceptibility to informational peer group influence (i.e., the tendency to learn about products and brands by seeking information from others). Normative peer group influence was measured with five items: "Do you think it is important that your friends like…" (1) "your school supplies", (2) "your clothes", (3) "the music you listen to", (4) "your shoes", and (5) "your room at home?" with the response categories (1) "really not important", (2) "not important", (3) "important", and (4) "very important". The item scores were averaged to form a total score for susceptibility to normative peer influence ($\alpha = .87$, $M = 2.33$, $SD = .68$).

Susceptibility to informational peer influence was measured with five items too: "How often do you ask your friends to help you…" (1) "choose new school supplies", (2) "choose new clothes", (3) "make a wish list", and (4) "choose new shoes", as well as (5) "How often do you talk to your friends about brands?" with the response option (1) "almost never", (2) "sometimes", (3) "regularly", and (4) "often". A mean score for susceptibility to informational peer influence was created ($\alpha = .83$, $M = 1.43$, $SD = .48$).

Results

Multigroup Confirmatory Factor Analysis

We subsequently estimated the baseline model, the metric invariance model, and the scalar invariance model for children and parents using maximum likelihood estimation with robust standard errors (MLR) in Mplus 6. This estimator was selected because it allows to account for the clustered data structure which resulted from the measurement of

child-parent dyads (Muthén and Muthén 2010). Accordingly, a dyad number was included as cluster variable in the multigroup analysis.

The baseline model revealed a low fit to the data: χ^2 (18, $n = 5990$) = 2363.361, $p < .001$, CFI = .808, RMSEA = .209, SRMR = .079. However, the modification indices suggested that model fit could be improved by including an error correlation between the first and second indicator of the 6-item MVS-c, which tap into the idea that one likes to own expensive things (i.e., "Do you think it's important to own expensive things?" and "Do you think it's important to own expensive brands?"), as well as an error correlation between the fifth and sixth indicator, which denote that one prefers people who own a lot of things (i.e., "Do you like people who have expensive things more than you like other people?" and "Do you like people who have a lot of things more than you like other people?"). Including these error correlations resulted in a model with an acceptable fit: χ^2 (14, $n = 5990$) = 257.047, $p < .001$, CFI = .980, RMSEA = .076, SRMR = .024. As expected, we found that all MVS-c indicators had a positive and significant loading on the latent factor both in the child sample ($.60 \leq \lambda \leq .80$, $ps < .001$) and in the adult parent sample ($.56 \leq \lambda \leq .81$, $ps < .001$). Accordingly, the materialism factor explained 54.4% of the indicators' total variance in the child sample and 51.7% in the parent sample. These findings corroborate the notion that the items share one common factor in both age groups and, thus, support the factorial validity hypothesis in the child and adult parent samples.

To investigate whether the factor loadings were the same in the child and the parent group, we tested for metric invariance. That is, the fit of the baseline model was compared to the fit of a model, in which the loadings of like indicators were constrained to be equal across groups. The fit of the baseline model and the metric invariance model are summarized in Table 2 (model 1 and 2). As can be seen, only marginal differences in model fit were found: ΔCFI = − .004, ΔRMSEA = − .005, and ΔSRMR = .015. Because the differences lie below the critical thresholds suggested by Chen (2007), metric invariance of the 6-item MVS-c across children and parents can be assumed. This lends first support to the metric invariance hypothesis.

The results of the test of scalar invariance were not conclusive (Table 2, model 3 and 4): In comparison to the metric invariance model, there were only marginal changes in the RMSEA (ΔRMSEA = .008) and the SRMR (ΔSRMR = .002), which indicates that scalar invariance does hold. In contrast, there was a substantial decrease in the CFI (ΔCFI = − .012), which indicates that equality of intercepts cannot be assumed. It should be noted that several researchers have pointed out that full metric and scalar invariance may be a too restrictive assumption and that comparisons across populations are admissible even when the loadings and intercepts of some indicators are not invariant (Byrne et al. 1989; Steenkamp and Baumgartner 1998). Such a partially invariant model can be used to compare means as long as at least two indicators are invariant (Steenkamp and Baumgartner 1998). An inspection of the modification indices suggested that constraining

Table 2 Model comparisons: impact of metric invariance constraints on model fit in the child and adult parent samples

Model	χ^2	*df*	*p*	CFI	RMSEA	SRMR
1. Children and parents, unconstrained	257.047	14	< .001	.980	.076	.024
2. Children and parents, metric invariance	308.258	19	< .001	.976	.071	.039
3. Children and parents, scalar invariance	469.268	24	< .001	.964	.079	.041
4. Children and parents, partial scalar invariance	340.795	22	< .001	.974	.070	.035

the intercept of the fourth and sixth indicator of the 6-item MVS-c was the cause of the model misspecification. Thus, we estimated a partial scalar invariance model in which the intercepts of the fourth and sixth indicator were not constrained across groups. The model comparison revealed that there were no substantial decreases in model fit (ΔCFI = − .002, ΔRMSEA = − .001, ΔSRMR = − .004) and that partial scalar invariance can be assumed. This lends partial support to the scalar invariance hypothesis.

Reliability and Construct Validity

Estimating Cronbach's alpha revealed a good internal consistency of the scale in both the child ($\alpha = .89$) and the adult parent samples ($\alpha = .88$). Construct validity was assessed by inspecting the bivariate zero-order correlations between the 6-item MVS-c and gender, age, life satisfaction, and susceptibility to peer influence (see Table 3). In the child sample, the weak associations between the MVS-c and gender ($r = -.04$, $p = .03$) and the MVS-c and age ($r = .07$, $p < .001$) were in line with our expectations. Boys and older children were found to be somewhat more materialistic. The proposed relationships between the MVS-c and life satisfaction ($r = -.24$, $p < .001$), normative peer influence ($r = .45$, $p < .001$), and informational peer influence ($r = .32$, $p < .001$) could also be identified. Materialistic children were less happy and more susceptible to peer influences.

In the adult parent sample, the weak negative associations of the MVS-c with gender ($r = -.16$, $p < .001$), age ($r = -.05$, $p < .001$), and life satisfaction ($r = -.07$, $p < .001$) were in line with our expectations. Men were more materialistic than women, an increase in age was associated with lower materialism, and materialism was related to lower life satisfaction.

In summary, our propositions regarding the relationship of the MVS-c with other constructs were corroborated, although the strength of the relationships was sometimes weaker than expected. As suspected, the relationship between materialism and gender was weak (see Karabati and Cemalcilar 2005; Kilbourne and LaForge 2010). The propositions that children's materialism slightly increases with age (Opree et al. 2011; Chaplin and John

Table 3 Bivariate zero-order correlation matrix for gender, age, life satisfaction, susceptibility to peer influence, and the 6-item MVS-c for the child and adult parent samples

	1	2	3	4	5	6
Children ($n = 2995$)						
1. 6-Item MVS-c	1					
2. Gender	− .04*	1				
3. Age	.07***	.00	1			
4. Life satisfaction	− .24***	.07***	− .12***	1		
5. Normative peer influence	.45***	.16***	.03	− .11***	1	
6. Informational peer influence	.32***	.17***	.17***	− .00	.38***	1
Adult parents ($n = 2995$)						
1. 6-Item MVS-c	1					
2. Gender	− .16***	1				
3. Age	− .05*	− .23***	1			
4. Life satisfaction	− .07***	− .01	− .01	1		

#$p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$. Correlations with parents' life satisfaction are based on $n = 2954$

2007) and that adult parents' materialism decreases with age (Jaspers and Pieters 2016) were confirmed. Finally, materialism was, as expected, negatively related to children's and adult parents' life satisfaction (see Opree et al. 2011), and positively related to children's normative and informational peer influence (see Opree et al. 2011). Overall, the findings corroborate the reliability and the construct validity hypotheses in the child and adult parent samples.

Study 2

Method

Participants

An online questionnaire was administered to a sample of Dutch adolescents aged 15–17 and emerging adults aged 18–21. The data collection was conducted by the same company as in Study 1. The data was collected in June 2014. Again, because this study was also part of a broader project on the effects of media use on youths' ideals and values (viz., Opree and Kühne 2016), the survey included several measures on media use, values, and socio-demographics. The questionnaire took about 10 min to complete and each participant was provided with a small incentive for participating. Before the start of the study, informed consent was obtained from the participants and from their parents if the participants were younger than 18 years. The study was granted IRB approval by the university's ethical committee. In total, 267 adolescents (55% female; $M_{age} = 15.93$, $SD_{age} = .81$) and 265 emerging adults (57% female; $M_{age} = 19.51$, $SD_{age} = 1.12$) participated.

Measures

The 6-item MVS-c (Opree et al. 2011) was administered to adolescents and emerging adults. The scale was identical to the one used in Study 1, except that the response categories ranged from 1 (not at all) to 5 (very much). The indicators were averaged to create a materialism scale ($M_{adolescents} = 2.23$, $SD_{adolescents} = .96$; $M_{emerging\ adults} = 2.01$, $SD_{emerging\ adults} = .75$). In accordance with in Study 1, gender (1 = male, 2 = female), age, and life satisfaction were measured too. As among the parents in Study 1, life satisfaction was measured with a single item: "On a scale from 1 to 10, how happy are you overall?" with response categories ranging from 1 (very dissatisfied) to 10 (very satisfied) ($M_{adolescents} = 7.69$, $SD_{adolescents} = 1.44$; $M_{emerging\ adults} = 7.48$, $SD_{emerging\ adults} = 1.19$).

As additional constructs for the assessment of the 6-item MVS-c's validity, happiness with possessions, narcissism, and entitlement were measured. Happiness with possessions was measured using the item "On a scale from 1 to 10, how happy are you with your current possessions?" with 1 indicating "completely dissatisfied" and 10 indicating "completely satisfied". Narcissism was measured with the 16-item Narcissistic Personality Inventory (NPI-16) (Ames et al. 2006). The scale included 16 pairs of items, each pair consisting of one item indicating high narcissism and one item indicating low narcissism (e.g., "Everybody likes to hear my stories" and "Sometimes I tell good stories"). A total score for narcissism was formed by counting how many times participants chose the high narcissism alternative ($M_{adolescents} = 4.03$, $SD_{adolescents} = 3.07$; $M_{emerging\ adults} = 4.15$, $SD_{emerging\ adults} = 2.84$). The instrument had an acceptable reliability ($\alpha_{adolescents} = .74$;

$\alpha_{emerging\ adults} = .68$). Entitlement was measured with Beutler and Gudmunson's (2012) Money Attitude Scale. The scale included six items (e.g., "I feel it is my parents' job to pay for my everyday needs") with response categories ranging from 1 (not at all) to 5 (very much). The scale was reliable ($\alpha_{adolescents} = .82$; $\alpha_{emerging\ adults} = .81$), and a mean score for feeling of entitlement was formed ($M_{adolescents} = 3.13$, $SD_{adolescents} = .72$; $M_{emerging\ adults} = 2.32$, $SD_{emerging\ adults} = .73$).

Results

Multigroup Confirmatory Factor Analysis

Estimating the baseline model revealed a low fit to the data: χ^2 (18, $n = 532$) = 202.062, $p < .001$, CFI = .828, RMSEA = .196, SRMR = .073. Yet, including the same error correlations as in Study 1 and an error correlation between the third and the fifth indicator, which both refer to children's attitudes towards expensive things, resulted in an acceptable model fit: χ^2 (12, $n = 532$) = 29.358, $p < .01$, CFI = .984, RMSEA = .074, SRMR = .029. Again, we found that all MVS-c indicators had positive and significant loadings on the latent factor both in the adolescent sample ($.70 \leq \lambda \leq .88$, $ps < .001$) and in the emerging adult sample ($.61 \leq \lambda \leq .78$, $ps < .001$). The materialism factor explained 66.6% of the indicators' total variance in the adolescent sample and 53.6% in the emerging adult sample. This supports the factorial validity hypothesis in the adolescent and emerging adult samples.

To investigate whether the factor loadings were the same in the adolescent and the emerging adult group, a test of metric invariance was conducted. The fit of the baseline model and the metric invariance model are summarized in Table 4 (model 1 and 2). The changes in the CFI (ΔCFI = .001), RMSEA (ΔRMSEA = −.011), and SRMR (ΔSRMR = −.003) indicate that the metric invariance model fitted the data as well as the baseline model. In addition, the test of scalar invariance revealed that equality of the intercepts can be assumed (Table 4, model 3). Constraining the intercepts only led to marginal changes in model fit in comparison to the metric invariance model: ΔCFI = −.004, ΔRMSEA = −.002, and ΔSRMR = .003. Altogether, these results suggest that metric and scalar invariance hold across the adolescent and the emerging adult group. Thus, the findings provide further support for the metric and scalar invariance hypotheses.

Reliability and Construct Validity

The internal consistency of the 6-Item MVS-c was good in the adolescent ($\alpha = .93$) and the emerging adult samples ($\alpha = .88$). This supports the reliability hypothesis. Construct validity was again assessed by inspecting the 6-item MVS-c's bivariate zero-order correlations with a series of other constructs. In addition to the constructs employed in Study 1

Table 4 Model comparisons: impact of metric invariance constraints on model fit in the adolescent and emerging adult samples

Model	χ^2	*df*	*p*	CFI	RMSEA	SRMR
1. Adolescents and emerging adults, unconstrained	29.358	12	< .01	.984	.074	.029
2. Adolescents and emerging adults, metric invariance	34.664	17	< .01	.983	.063	.032
3. Adolescents and emerging adults, scalar invariance	44.074	22	< .01	.979	.061	.035

(i.e., gender, age, and life satisfaction), happiness with possessions, narcissism, and entitlement were used in the validity assessment (see Table 4). We first inspected the correlations in the adolescent sample. In line with our expectations, we found no association between the 6-item MVS-c and gender ($r = -.07$, $p = .26$) and age ($r = -.04$, $p = .56$), a negative association with happiness with possessions ($r = -.26$, $p < .001$), and a positive association with narcissism ($r = .28$, $p < .001$) and entitlement ($r = .45$, $p < .001$). That is, among adolescents, high materialism was associated with lower happiness with possessions, and higher narcissism and entitlement. However, unexpectedly, we did not find an association with life satisfaction ($r = -.04$, $p = .51$) in the adolescent sample (Table 5).

In the emerging adult sample, we found a very similar pattern of correlations. The 6-item MVS-c was not associated with age ($r = -.01$, $p = .86$), but it was negatively associated with gender ($r = -.16$, $p = .01$) and happiness with possessions ($r = -.13$, $p = .04$), and positively associated with entitlement ($r = .38$, $p < .001$). The positive correlation between the MVS-c and narcissism was marginally significant ($r = .12$, $p = .06$). All the findings above were in line with our expectations. Again, in contrast to our assumptions, the MVS-c was not related to life satisfaction ($r = -.02$, $p = .80$).

Overall, we found adequate support for the validity hypothesis in the adolescent and the emerging adult samples. In line with our propositions, there was no consistent relationship between materialism and gender (see Karabati and Cemalcilar 2005; Kilbourne and LaForge 2010) as the correlation was only significant for emerging adults, but not for adolescents. As expected, adolescents' and emerging adults' age was not substantively related to materialism (see Opree et al. 2011). Moreover, the correlational analyses corroborated our assumptions that adolescents' and emerging adults' materialism was negatively related to their happiness with possessions (Roberts and Clement 2007), and positively related to their narcissism and entitlement (see Twenge 2006; Twenge and Campbell 2009). Only

Table 5 Bivariate zero-order correlation matrix for gender, age, life satisfaction, happiness with possessions, narcissism, entitlement, and the 6-item MVS-c in the adolescent and emerging adult samples

	1	2	3	4	5	6	7
Adolescents ($n = 267$)							
1. 6-Item MVS-c	1						
2. Gender	−.07	1					
3. Age	−.04	−.03	1				
4. Life satisfaction	−.04	−.20***	−.01	1			
5. Happiness with possessions	−.26***	−.02	−.07	.48**	1		
6. Narcissism	.28***	−.13*	−.01	.06	−.10	1	
7. Entitlement	.45***	−.16**	−.13*	−.19**	−.28***	.21***	1
Emerging adults ($n = 265$)							
1. 6-Item MVS-c	1						
2. Gender	−.16*	1					
3. Age	−.01	.01	1				
4. Life satisfaction	−.02	−.11$^{\#}$	−.04	1			
5. Happiness with possessions	−.13*	.02	.03	.42***	1		
6. Narcissism	.12$^{\#}$	−.09	.06	.06	.12*	1	
7. Entitlement	.38***	−.06	−.20**	−.05	−.19**	−.01	1

$^{\#}p < .10$; $^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$

the missing relationships between materialism and life satisfaction and the weak relationship between emerging adults' materialism and their narcissism contradicted our expectations (see Opree et al. 2011). The missing link between materialism and life satisfaction is addressed in the discussion.

Combined Analysis of Study 1 and 2

In a final step, we combined the four samples (i.e., children, adolescents, emerging adults, and adult parents) in order to test the metric invariance and scalar invariance hypotheses for all groups simultaneously (note that the factorial validity hypothesis, reliability hypothesis, and construct validity hypothesis were tested per group, and do not need to be revisited). Because of the different number of response categories that were used in the assessment of the 6-item MVS-c in Study 1 (i.e., four) and Study 2 (i.e., five), the subsequent analyses should be regarded as preliminary. Still, it is important to note that although it would have been preferable to have had used the same number of response categories in both studies (i.e., either four or five), this difference in approach is unlikely to have substantially influenced the results of the measurements of materialism. We do not have direct evidence that the measurement of materialism is robust to this choice, but methodological research on the effects of the number of response options on the measurement of attitudes shows that the results are very consistent: Using confirmatory factor analyses, Adelson and McCoach (2010) demonstrated that using 4-point and 5-point measures resulted in equal intercepts, means, variances and covariances, pattern coefficients, and mostly equal residuals. Similarly, Leung (2011) found that using 4- and 5-point Likert scales produced no differences with regard to the mean, standard deviation, inter-item correlations, item total correlations, reliability, and factor loadings.

Finding that metric and scalar invariance holds across all four age groups would be important evidence for the scale's applicability across the lifespan. Similar to Study 1 and Study 2, the baseline model was estimated with MLR. In similar vein, a dyad number was included as cluster variable to account for the clustering of children and parents. In line with the previous findings, the model had a poor fit to the data: χ^2 (36, $n = 6522$) = 2370.754, $p < .001$, CFI = .806, RMSEA = .199, SRMR = .079. However, incorporating the two error correlations which were included in Study 1 and the error correlation which was added in Study 2 resulted in an acceptable model fit: χ^2 (24, $n = 6522$) = 228.537, $p < .001$, CFI = .983, RMSEA = .072, SRMR = .023.

The equality of the factor loadings across the four age groups was assessed with a test of metric invariance. The fit of the baseline model and the metric invariance model are depicted in Table 6 (model 1 and 2). There are only marginal differences in model fit: ΔCFI = − .004, ΔRMSEA = − .009, and ΔSRMR = .015. This finding further corroborates

Table 6 Model comparisons: impact of metric invariance constraints on model fit in the child, adolescent, emerging adult, and adult parent samples

Model	χ^2	*df*	*p*	CFI	RMSEA	SRMR
1. Combined samples, unconstrained	228.537	24	< .001	.983	.072	.023
2. Combined samples, metric invariance	294.579	39	< .001	.979	.063	.038
3. Combined samples, scalar invariance	526.058	54	< .001	.961	.073	.044
4. Combined samples, partial scalar invariance	330.394	45	< .001	.976	.062	.038

the metric invariance hypothesis: The factor loadings of the 6-item MVS-c seem to be comparable across all four age groups. Next, we tested the scalar invariance of the 6-item MVS-c across the four age groups (Table 6, model 3 and 4). The test did not reveal a clear pattern. In comparison to the metric invariance model, there was only a marginal change in the RMSEA (ΔRMSEA = .010), but there were substantial changes in the CFI (ΔCFI = − .018) and the SRMR (ΔSRMR = .006). Modification indices revealed that the intercepts of the fourth, fifth, and sixth indicator of the 6-item MVS-c varied across the four age groups. Thus, we estimated a partial scalar invariance model in which the constraints on the three indicators were relaxed. The final model comparison revealed that there were only marginal differences in the model fit (ΔCFI = − .003, ΔRMSEA = − .001, ΔSRMR = .000) so that partial scalar invariance can be assumed. Thus, the hypothesis of scalar invariance across the four age groups is partially supported. Overall, the invariance tests indicate that the 6-item MVS-c can be used for comparisons across the children, the adolescent, the emerging adult, and the adult population.

Discussion

The current study built on the insights of Opree et al. (2011), who have validated the MVS-c among children between the ages of 8 and 12. This study expanded on their findings and aimed to investigate the metric and scalar invariance of the 6-item MVS-c among four different age groups (i.e., 8- to 12-year-olds, 15- to 17-year-olds, 18- to 21-year-olds, and adult parents aged 25 +) to determine whether the scale can be administered across the lifespan. The data of two existing studies were used to assess the 6-item MVS-c's factorial structure, reliability, and validity in middle childhood, adolescence, emerging adulthood, and adulthood. The data of these two studies were first analyzed separately and then together. Importantly, across the four age groups the factorial validity hypothesis was corroborated: The indicators of the 6-item MVS-c had positive and significant factor loadings and shared a substantial amount of variance. Thus, materialism emerged as common factor across all age groups. Moreover, metric invariance and (partial) scalar invariance was established. This indicates that the 6-item MVS-c can be used to compare relationships between the materialism and other measures and (latent) means of the concept across age groups (see Steenkamp and Baumgartner 1998).

Though metric and (partial) scalar invariance were established, reliability and validity also needed to be addressed in order to conclude that the use of the 6-item MVS-c is meaningful. High internal consistency was found across all age groups ($.88 \leq \alpha \leq .93$), which supports the reliability hypothesis. The findings with regard to the construct validity of the 6-item MVS-c should be seen in the context of the previous research by Opree et al. (2011), as well as that of other scholars studying the relation between materialism and other constructs. We were able to replicate previous findings and, as expected, found (1) no or only a small relation between materialism and gender in all four age groups—with boys/men being more materialistic than girls; (2) no or only a small relation between materialism and age in all four age groups—with materialism increasing only among children; (3) a positive relation between materialism and children's susceptibility to normative peer group influence; (4) a positive relation between materialism and children's susceptibility to informational peer group influence; (5) a negative relation between materialism and adolescents' and emerging adults' happiness with possessions; (6) a positive relation between materialism and adolescents' and emerging adults' narcissism; and, finally, (7) a positive relation

between materialism and adolescents' and emerging adults' feelings of entitlement. Overall, these findings provide adequate support for the construct validity hypothesis.

However, in contrast to our expectations, we were only able to replicate the negative relationship between materialism and life satisfaction among children and adult parents. The observed relationship among adult parents was weak though, and we observed no significant relationship among adolescents and emerging adults. There are both methodological and theoretical explanations for these findings. First of all, while we employed a multi-item scale for the measurement of children's life satisfaction, we employed a single-item measure among adolescents, emerging adults, and adult parents. Although single-item measures of life satisfaction have been shown to be valid (Cheung and Lucas 2014) and are regularly used in research (Veenhoven 2015), we cannot preclude that the differences in the size of the relationship between materialism and life satisfaction are due to the use of two different measurement approaches. Second, the sample sizes of the adolescent and emerging adult samples were considerably smaller—the power of the analyses may not have been strong enough to pick up on subtle effects. Third, adolescents and emerging adults are in a phase of identity exploration (Arnett 2015): Their happiness may be more closely connected to personal growth (e.g., experiencing body changes, gaining peer group acceptance, engaging in romantic relationships, and increasing their financial independence) than anything else. Fourth, and most importantly, the relation between materialism and life satisfaction is questioned in a growing number of studies (for a synthesis, see Rindfleisch and Burroughs 1999). The generalizability of this finding is put into question for the reason that the relationship between materialism and life satisfaction may not only be influenced by developmental factors, but also by social and cultural dynamics. Rindfleisch and Burroughs (1999), for instance, found that materialism and life satisfaction were negatively related among children from intact families, but positively related among children from broken families.

In addition to the limited size of the adolescent and emerging adult samples, this study had four further methodological limitations. First and relatedly, the differences in the sample sizes of the four age groups may not only influence significance tests of correlations, but also the results of confirmatory factor analyses. However, it is noteworthy that the adolescent and the emerging adult samples were definitely large enough (with 267 and 265 cases respectively) to warrant unbiased parameter estimates and sufficiently small standard errors in the confirmatory factor analyses (Anderson and Gerbing 1988). Still, because larger sample sizes support more precise parameter estimates, future research could provide additional insights by employing the MVS-c among larger samples of adolescents and emerging adults. Second, the age group of 13- to 14-year-olds is not included in the current study. Considering that the 6-item MVS-c is validated for children between the ages of 8 and 12, as well as adolescents between the ages of 15 to 17 (i.e., the developmental stages that precede and, respectively, succeed this age group), it seems plausible that the MVS-c can also be used in this age group, though this assumption remains to be formally tested. Third, because we did not obtain longitudinal data for the adolescents and emerging adults, all analyses are cross-sectional—which means that we are able to study the correlates of materialism, but not its causes and consequences. Fourth, the validation measures were not completely identical across the two studies due to studies being part of larger research projects. Ideally, both studies would have included exactly the same validation measures because this would have facilitated comparisons of validity across the age groups. Still, because most correlations were in line with the theoretical expectations, there is ample evidence for the 6-item MVS-c's validity. Also, the set of validation measures was limited. Ideally, both studies would have included an alternative measure of materialism to

establish convergent validity (DeVellis 2016). In addition, other constructs belonging to the nomological network of materialism (e.g., non-generosity, envy, and possessiveness; see Bottomley et al. 2010) could have been included too. Still, conducting longitudinal research and including additional evidence for the construct validity of the MVS-c may both be considered suggestions for future research.

Future Applications

Now that metric and scalar invariance for the 6-item MVS-c have been established this opens up new and fruitful areas for future cross-sectional and longitudinal research. In addition to making simple one-on-one comparisons in means and effects between age groups, we could gain a more thorough understanding of the development of materialism in children by applying a social ecology perspective. In short, Bronfenbrenner's (2009) social ecology framework poses that children are influenced by their surrounding microsystem (e.g., parents, siblings, and peers), ecosystem (e.g., extended family and mass media), and macrosystem (e.g., culture). By administering the 6-item MVS-c to children and their social environments, we may increase our knowledge about the transfer of materialistic values and ideals.

An additional benefit of longitudinal studies is that they allow scholars to (a) investigate other presumed causes (such as advertising exposure and experiencing distressing life events; see Opree et al. 2014, 2018) as well as consequences of materialism too (such as excessive spending and debt, see Garðarsdóttir and Dittmar 2012; Richins 2011; Watson 2007); (b) inform parents, caretakers, teachers, and policy makers about the need for interventions tackling the causes and consequences of materialism; (c) provide inspiration for potential contents of such interventions—if, for instance, materialism does lead to excessive spending and debt, interventions may need to focus on promoting children's financial literacy (for suggestions, see Lusardi and Mitchell 2014); and, finally, (d) measure the short- and long-term effectiveness of materialism-reducing interventions.

The additional benefit of longitudinal studies is that they can disentangle age differences from life cycle and cohort effects: Are changes in materialism the result of age, specific life events, or the spirit of the times (Hellevik 2002; Jaspers and Pieters 2016)? As indicated in the introduction, academic and societal concerns about the impact of consumer culture and children's materialism are rising (Buckingham 2011; Dávila et al. 2017; Opree 2014). Though it is a common assumption that materialistic children will grow up to be materialistic adults, this assumption is actually yet to be empirically tested. By implementing the 6-item MVS-c in longitudinal studies, we can challenge and test this predominant thought.

Future Directions

In sum, the 6-item MVS-c can be used to assess differences in materialism as well as its causes and consequences across middle childhood, adolescence, emerging adulthood, and adulthood. In addition, the 6-item MVS-c can be used to study the transfer of material values within social networks, the causes and consequences of material values, and the persistence of material values over time. Still, two important methodological endeavors for future research remain. The MVS-c and its short versions were developed for children between the ages of 8 and 12. Recently, research has also validated the use of the MVS-c

and its shorter versions among children aged 6 and 7, for whom it can be used in individual structured interviews using pictorial answer categories (van der Meulen et al. 2017). However, because the use of structured interviews is unadvisable for children aged 5 and below (Borgers et al. 2000), it does not seem viable to validate the MVS-c in younger age groups. At the same time, the MVS-c has also not been validated for children between the ages of 13 and 14, an age group that was missing in the current data. The first suggestion for future methodological research, therefore, is to validate the MVS-c among these so-called tweens—a demographic that is receiving increasingly more attention from both marketers and marketing researchers (Lindstrom 2004; Prince and Martin 2012).

Importantly, both the original study about the MVS-c and the current studies were conducted in the Netherlands. However, scholars have started using the MVS-c in other countries too—some of which may be considered culturally close (e.g., Belgium, see Hudders et al. 2016), and others culturally distant (e.g., China, see Jiang et al. 2015; India, see Soni and Behal 2015; and Turkey, see Akin et al. 2013). Those who employed the MVS-c in a culturally distant environment have confirmed the scale's reliability and validity. However, the metric and scalar invariance of the MVS-c has not been investigated in a cross-cultural context. Our second suggestion for future methodological research is for international colleagues to collaborate and conduct such a study. Not only is establishing cross-cultural metric and scalar invariance crucial for allowing comparisons in children's materialism scores and the causes and consequences of materialism across countries, it is also essential in determining the extent to which the current-day studies can be compared.

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Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Research Involving Human Participants/Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. More specifically, the two studies are non-medical and comply with the American Psychological Association's ethical standards in the treatment of participants and were approved by the Review Board of the authors' Department.

Informed Consent Informed consent was obtained from all individual participants included in the study. In study 1, data was collected from children aged 8–12 and one of their parents. Informed consent was obtained from the participating parent and the child. In study 2, data was collected from adolescents aged 15–17 and emerging adults aged 18–21. Informed consent was obtained from the participants and from their parents if the participants were younger than 18 years.

Data Access We, Rinaldo Kühne and Suzanna J. Opree, take responsibility for the integrity of the data and the accuracy of the data analysis. The data and accompanying syntax are stored in the Digital Data Repository of the Amsterdam School of Communication Research (http://ascor.uva.nl/contact/contact.html).

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