The Hierarchical Structure of Childhood Personality in Five Countries: Continuity From Early Childhood to Early Adolescence

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ABSTRACT   Childhood personality is a rapidly growing area of investigation within individual differences research. One understudied topic is the universality of the hierarchical structure of childhood personality. In the present investigation, parents rated the personality characteristics of 3,751 children from 5 countries and 4 age groups. The hierarchical structure of childhood personality was examined for 1-, 2-, 3-, 4-, and 5-factor models across country (Canada, China, Greece, Russia, and the United States) and age group (3–5, 6–8, 9–11, and 12–14 years of age). Many similarities were noted across both country and age. The Five-Factor Model was salient beginning in early childhood (ages 3–5). Deviations

across groups and from adult findings are noted, including the prominent role of antagonism in childhood personality and the high covariation between Conscientiousness and intellect. Future directions, including the need for more explicit attempts to merge temperament and personality models, are discussed.

Individual differences in personality have primarily been studied with adult populations, partly due to the availability and administrative ease of existing adult personality measures. Early attempts to apply adult personality measures to children and adolescents yielded promising results, however, suggesting that self- and informant report questionnaires could be applied to younger age groups (Tackett, 2006). This work, in combination with the extensive literature on temperament, offered a substantial foundation for seminal reviews on the conceptualization and measurement of childhood personality (Caspi, Roberts, & Shiner, 2005; Shiner & Caspi, 2003). As the burgeoning field of childhood personality research continues to grow, advances have been made in creating developmentally appropriate measures (e.g., Barbaranelli, Caprara, Rabasca, & Pastorelli, 2003; Halverson et al., 2003; John, Caspi, Robins, Moffitt, & Stouthamer-Loeber, 1994; Mervielde & De Fruyt, 1999). With improved measurement comes better research on outcomes, and childhood personality is now recognized as a demonstrated predictor of many important adult outcomes (e.g., physical and mental health, adaptive relationships; Hampson, 2008).

Further research is needed to capitalize on these promising early successes and tackle existing gaps in our understanding of childhood personality. The present study focuses on one such unstudied issue: the nature of hierarchical personality structure in younger populations. Hierarchical structures are targeted for investigation in the present study because they hold both theoretical (e.g., understanding the development of trait relationships) and practical (e.g., facilitating integration of results across studies) implications for this area of research, representing a necessary feature for understanding personality variation (Markon, 2009).

Childhood Personality Across Development

Multiple studies have examined mean-level change and differential stability of personality traits prior to adulthood (e.g., Allik, Laidra, Realo, & Pullmann, 2004; De Fruyt et al., 2006; McCrae et al., 2002;

Roberts & DelVecchio, 2000; Roberts, Walton, & Viechtbauer, 2006). Most of this research has investigated personality traits within the Five-Factor Model (FFM), the predominant approach to measuring personality in adults (John, Naumann, & Soto, 2008). The FFM includes five higher order domains: Neuroticism (N), Extraversion (E), Agreeableness (A), Conscientiousness (C), and Openness to Experience (O). This structure, while well established within adults, has not been as thoroughly examined within younger populations.

Merging this FFM literature with research on temperament will lead to a better understanding of personality structure across childhood. In order to do so, it is necessary to reconcile potential differences in temperament and personality models, some of which parallel previous debates in adult personality research. For example, Rothbart's prominent temperament measures converge on three, rather than five, higher order factors: Extraversion/Surgency, Negative Affectivity, and Effortful Control (e.g., Rothbart, Ahadi, Hershey, & Fisher, 2001). Similar to three-factor models in adults (e.g., Tellegen & Waller, 1992), two of the FFM traits are represented in this model: E and N (although N often includes components of disagreeableness as well). The third trait reflects a broader disinhibitory construct, likely reflecting both A and C components (Caspi et al., 2005). Thus, in temperament models, A does not emerge as a higher order trait early in development, although an analogous trait (affiliativeness) is present in adolescent/adult measures (Evans & Rothbart, 2009). Further, in both temperament and adult three-factor models, O as a higher order domain is missing. In models of childhood personality, A is sometimes represented by aspects of agreeable compliance and antagonism more so than the typical FFM models in adults (De Pauw & Mervielde, 2010; Digman & Shmelyov, 1996; Goldberg, 2001; Tackett, Krueger, Iacono, & McGue, 2008). Openness to Experience is often marked by curiosity, intellect, and imagination in childhood (Gjerde & Cardilla, 2009; Goldberg, 2001; Halverson et al., 2003) without including items such as cultural interests and aesthetic appreciation, items that are more common in adult measures. Taken together, these findings suggest that early models of individual differences often do not include A and O and, when they do, they are commonly measured somewhat differently than in adults.

It has been hypothesized that early temperamental traits break down into more complex personality traits across development (e.g., Digman & Shmelyov, 1996; Rothbart, Ahadi, & Evans, 2000;

Rothbart & Bates, 2006; Shiner & Caspi, 2003), suggesting that these taxonomic differences across age may be suggestive of developmental phenomena (Caspi et al., 2005). For example, early life taxonomies suggest that A and C reflect a common trait in childhood. If this is the case, then an important question is at what point across development do A and C become distinct phenomena? Self-reports of personality demonstrate that A and C become increasingly differentiated between 10 and 20 years of age (Soto, John, Gosling, & Potter, 2008), but a greater understanding of this potential differentiation even earlier in life is lacking. A similar question might be asked of O: When does this trait emerge in development? Previous research has suggested that O may not be an emergent trait in childhood (Eder, 1990), manifesting only later in adolescence or early adulthood. Such an explanation would account for the absence of O in early age temperament models. More recent studies, however, have suggested that O is salient and measurable by early childhood (De Pauw, Mervielde, & Van Leeuwen, 2009; Gjerde & Cardilla, 2009). Additional evidence speaking toward these divergent accounts is an important goal for research in childhood personality.

   A primary barrier to addressing these questions has been a lack of measurement tools that span the relevant ages (De Pauw & Mervielde, 2010). Relying on adult instruments may not be the ideal approach to providing such evidence because personality traits may show heterotypic continuity across development. That is, manifestations of the same underlying trait may look different depending on the developmental period (Caspi et al., 2005; De Fruyt, Mervielde, Hoekstra, & Rolland, 2000). Difficulty extracting A or O in a childhood sample may be the result of measurement limitations rather than evidence against the presence of A and O as distinct traits at early ages (De Pauw & Mervielde, 2010). Examination of different levels of the personality hierarchy across age, using age-appropriate measures, will offer important insight into these issues. Discussion of personality structure also requires consideration of similarities and differences across culture, in light of the interest in personality as a potential human universal (Lee & Ashton, 2008).

Childhood Personality Across Cultures

Just as understanding personality structure across age aids our development of comprehensive trait models, so does cross-cultural replication (Bornstein, 2002; Caspi et al., 2005). In recognition of this

fact, Caspi and colleagues (2005) described cross-cultural generalizability of personality structure as one of the most important future directions in childhood personality research. Evidence for cross-cultural similarities (and differences) in personality traits not only offers information in terms of mean-level distinctions but also helps to reveal underlying processes reflected in manifest traits (Rothbart et al., 2000). Thus, cross-cultural research in childhood personality offers an important avenue for better understanding convergence and divergence at the phenotypic level as well as the etiologic level. There are many important measurement considerations when comparing personality across cultures (Church, 2001), and rigorous cross-cultural replications are difficult to achieve. Cross-cultural personality research on adults has generally proven robust replication of the FFM, with respect to content and predictive validity (Church, 2001). However, of the factors in the FFM, O has generally received the weakest support across cultures (Church & Lonner, 1998; Heine & Buchtel, 2009). This similarity across cultures provides further support to the universality of trait structure, an important feature when investigating applicability to younger ages. Establishing robust trait structure across cultures at younger ages would support valid measurement of analogous traits at younger ages.

Culture is thought to be one of the most important environmental influences on personality development (Rothbart & Bates, 2006; Super & Harkness, 2002). Most previous studies of child personality have been conducted in Western cultures, typically involving participants from only one country, limiting the generalizability of these findings to younger populations as a whole (Gartstein, Peleg, Young, & Slobodskaya, 2009). Some cross-cultural studies of childhood personality have focused on examination of mean differences (e.g., Knyazev, Zupancic, & Slobodskaya, 2008), revealing some robust differences across individualistic and collectivistic cultures. For example, children in collectivistic cultures (e.g., China, Japan, and Korea) are often rated as more behaviorally inhibited than those in individualistic cultures (e.g., Australia, Canada, Italy, and the United States; Ahadi, Rothbart, & Ye, 1993; Chen et al., 1998; Rubin et al., 2006; Windle, Iwawaki, & Lerner, 1988). Limited studies investigating emergent factor structures across cultures have supported measurement equivalence for existing measures at early ages (e.g., Ahadi et al., 1993; Windle et al., 1988). To the best of our knowledge, a cross-cultural investigation of the hierarchical struc-

ture of childhood personality has not yet been undertaken. This is a particularly important issue, as trait hierarchy offers a more nuanced and flexible approach to examining group differences in the causal processes and behavioral manifestations of traits (Markon, 2009).

One of the primary strengths of the current study is the employment of the same measure of childhood personality across cultures. Moreover, an advantage of this measure is the developmental origins of the item pool, which emerged from a large and comprehensive cross-cultural approach to developing a taxonomy of childhood personality (Halverson et al., 2003; Kohnstamm, Halverson, Mervielde, & Havill, 1998). Although we draw upon cross-cultural work to inform the present study, it is important to note that the concept of culture is more complex than country of origin (Kotelnikova & Tackett, 2010; Schwartz, 1992). With that caveat, many cultural frameworks map onto specific countries, allowing for some generalization. Specifically, this investigation uses participants from countries that would typically be classified as collectivistic (i.e., China) and individualistic (i.e., Canada and the United States; Hofstede, 2001; Suh, Diener, Oishi, & Triandis, 1998). Of the other countries investigated, both are scored as more similar to collectivistic countries (Greece and Russia). We use the term *country* rather than *culture* in the present study to clearly indicate that a nuanced measure of culture was not utilized in this investigation.

Advances in Structural Models of Personality

Hierarchical structural models of personality traits have gained the attention of personality psychologists with the publication of Digman's (1997) important work on the existence of broad traits above the Big Five. The utility of hierarchical models has proven to be a useful tool in reconciling previous debates regarding differences and similarities among factorial structures. Markon, Krueger, and Watson (2005) utilized a hierarchical structural approach to demonstrate empirical connections among two-, three-, four-, and five-factor models of personality in adults. However, such work in adults has not been entirely conclusive, as similar investigations with adult temperament traits reveal a slightly different pattern of association. Specifically, A tends to merge with E at higher levels rather than with N and C (Evans & Rothbart, 2009).

Hierarchy has been described as "an intrinsic and pervasive feature of trait structure" (Markon, 2009, p. 812). Thus, a compre-

hensive understanding of trait structure in early life must incorporate investigations of hierarchy. Understanding trait hierarchies holds numerous advantages, both theoretical and practical (Markon, 2009). Hierarchies allow much greater flexibility in understanding trait structure than do simplistic models (which are more commonly evoked) and thus allow more nuanced explanations for causal theories of traits. This is particularly important when examining group differences, including differences across age or country, as we investigate in the present study. Practically speaking, trait hierarchies provide integrative structural frameworks within which various theoretical models and empirical results can be interpreted. This will facilitate further integration of the rich areas of temperament and child personality research.

Goldberg (2001) examined Digman's teacher ratings of childhood personality for children in Grades 1–6 via factor analysis and found support for the FFM. He further analyzed factor intercorrelations among the FFM as potential evidence of Digman's two-factor structure. He found broad support for a two-factor structure resembling that found with adults with 1 deviation, in that C and intellect were more highly correlated in children than was typically demonstrated in adults. In later work, longitudinal trait relationships for this sample in adulthood were more robust at this broader two-factor level than at the five-factor level (Hampson & Goldberg, 2006). Recent investigations (Martel, Nigg, & Lucas, 2008; Tackett et al., 2008) of the hierarchical structure of personality and temperament in childhood (children ranging in age from 7 to 13) have roughly paralleled the results established by Markon et al. (2005). These results show strongest convergence with the adult findings at the two-factor level, also consistent with Goldberg's (2001) investigation. Deviations from adult findings were also noted. In both studies, negative emotionality covaried highly with aspects of (dis)agreeableness (Martel et al., 2008; Tackett et al., 2008), positioning antagonistic traits in a more prominent role than is typically found in adult models. Numerous questions similarly remained for the role of O or intellect in these structures. Neither previous investigation included close analogs to O or intellect (Martel et al., 2008; Tackett et al., 2008), although one study included items measuring absorption (Tackett et al., 2008). Further, previous studies have not yet examined the full developmental range from early childhood to early adolescence. Thus, we build on this previous work with a more

comprehensive personality assessment and the ability to examine differences across age groups and countries.

The Present Study

In the present study, we sought to reconcile some remaining questions in this area of study by examining the hierarchical structure of childhood personality. In a large sample of children ranging in age from 3 to 14 years old and originating from five different countries around the world, we conducted a series of analyses examining item-level covariation of parent-reported personality characteristics. We first compared emergent hierarchical structures across five countries: Canada, China, Greece, Russia, and the United States. We next compared emergent hierarchical structures across four age groups: early childhood (3–5-year-olds), middle childhood (6–8-year-olds), later childhood (9–11-year-olds), and early adolescence (12–14-year-olds). The cross-country analyses were largely exploratory, given the lack of relevant work on cultural differences in childhood personality. Based on adult work, we expected to find strong similarities across countries for E, N, A, and C, with less robust emergence of O across countries. In the cross-age analyses, we hypothesized that evidence for two- and three-factor models would remain robust across development, with evidence for four- and five-factor models appearing more clearly at later ages.

METHOD

Participants

Canada.   The Canadian sample included caregiver report data for 392 children (49.7% female) from a large metropolitan area in southern Ontario. Caregivers were primarily mothers (95.9%), with the remainder being fathers (4.1%). Data from other caregivers were used in the present analyses only when mother report was not available, and this is true for the remaining samples as well. Mean age for the target children was 9.31 years ($SD = 1.91$), ranging from 4 to 13 years of age. Participants were recruited through a variety of methods, including use of a database maintained by the Department of Psychology consisting of interested parents, flyers, newspaper advertisements, and via the Institute for Child Study, affiliated with the University of Toronto. Personality data were collected as part of other larger studies.

China. The Chinese sample included caregiver report data for 506 children (50.6% female) from the Dalian region of China. Caregivers were primarily mothers (98.8%) but also included other caregivers if mother report was not available (1.2%). Mean age for the target children was 6.72 years ($SD = 2.32$), ranging from 4 to 11 years of age. Participants were recruited primarily from schools by faculty and students of the Liao Ning Teacher's College in Dalian.

Greece. The Greek sample included caregiver report data for 572 children (48.3% female) from the suburban Athens area. Caregivers were primarily mothers (96.5%) but also included fathers (3.2%) and other caregivers if mother report was not available (0.3%). Mean age for the target children was 10.02 years ($SD = 2.45$), ranging from 4 to 14 years of age. Participants were recruited using a snowball sampling method in which undergraduate and graduate psychology students nominated at least five families they knew with a preschool- or school-age child. These families were then contacted by phone. If they agreed to participate in the study, a research assistant visited them at their home and administered the questionnaires. These families were then asked to nominate another family with a preschool- or school-age child.

Russia. The Russian sample included caregiver report data for 1,374 children (47.6% female). Most data (70.5%) were collected in Novosibirsk, Russia's third largest city, with the remainder coming from rural Siberian regions (29.5%). Caregivers were primarily mothers (87.3%) but also included fathers (8.0%) and other caregivers (4.7%). Mean age for the target children was 8.63 years ($SD = 3.37$), ranging from 2 to 14 years of age. Participants were recruited through a variety of methods: Caregivers were approached via child care centers, schools, and in person, including home visits.

United States. The American sample included caregiver report data for 907 children (53.0% female) from Georgia, Virginia, and North Dakota. Caregivers were primarily mothers (63.2%) but also included fathers (27.3%) and other caregivers if mother report was not available (6.0%) and participants for whom caregiver status was not collected (3.5%). Mean age for the target children was 7.35 years ($SD = 3.16$), ranging from 2 to 14 years of age. Participants were recruited by undergraduate students who collected data as a class assignment or extra credit. Students identified and contacted parents with a preschool- or school-age child; if the parents agreed to participate, the students provided the parents with a questionnaire packet, which they completed and returned to the investigators.

Materials and Procedure

All samples were administered the Inventory for Child Individual Differences (ICID; Halverson et al., 2003), a 144-item measure designed to assess childhood personality. Items are rated on a 7-point Likert scale, ranging from 1 (*much less than the average child or not at all*) to 7 (*much more than the average child*). Only 108 of the ICID items are needed to score the 15 lower order scales, and some data collection in the current samples utilized this abbreviated version. In the present study, we use those 108 items that were collected for all participating children to ensure uniformity across samples. Translations of the Chinese and Greek ICID measures are described extensively elsewhere (Halverson et al., 2003), as is validation of the Russian version of the ICID (Knyazev & Slobodskaya, 2005).

Participating caregivers completed the 108- or 144-item ICID about their child. Caregivers completed the measures at home (Canada, China, Greece, Russia, and the United States) or in the lab (Canada). Canadian caregivers received modest monetary compensation for their participation. In some cases, Russian participants received monetary compensation or a small gift. The remaining Russian participants and all participants from the United States, Greece, and China were not compensated. All of the studies included in this analysis were approved by the relevant on-site ethics review board.

RESULTS

Scale scores at the five-factor domain level of the ICID items were calculated for descriptive purposes according to Halverson et al. (2003). Means and standard deviations of the scored ICID domains (on a 7-point scale) are presented in Table 1 by country and age group. Given that the primary goal of the study was to examine differences in emergent hierarchical structures, we used items in the following analyses rather than scales that presuppose a given personality structure in the data.

Goldberg's "Bass-ackwards" Method (2006)

The hierarchical structure of the 108 ICID items was extracted using the procedures recommended by Goldberg (2006) for examining hierarchical covariation among a set of items or behaviors. Adhering to these recommendations, we extracted principal components with varimax rotation at Levels 1–5 of the hierarchy.

Table 1

Means and Standard Deviations of Parental Ratings of Childhood Personality Across Countries and Age

Domain Scales	Country					Age Groups			
	Canada	China	Greece	Russia	United States	3–5	6–8	9–11	12–14
Neuroticism	3.55 (.66)	3.68 (.58)	3.74 (.67)	3.61 (.60)	3.51 (.68)	3.58 (.58)	3.66 (.62)	3.61 (.67)	3.58 (.68)
Extraversion	5.08 (.63)	4.95 (.60)	5.29 (.65)	4.65 (.61)	5.12 (.65)	5.03 (.63)	4.92 (.64)	4.93 (.69)	4.90 (.73)
Agreeableness	4.86 (.76)	4.70 (.57)	4.78 (.73)	4.76 (.63)	4.78 (.70)	4.72 (.59)	4.72 (.65)	4.80 (.72)	4.85 (.71)
Openness to Experience	5.16 (.78)	5.00 (.70)	5.23 (.76)	4.57 (.68)	5.07 (.77)	4.98 (.70)	4.86 (.73)	4.92 (.81)	4.87 (.86)
Conscientiousness	4.50 (.91)	4.49 (.77)	4.69 (.94)	4.32 (.74)	4.54 (.79)	4.51 (.67)	4.40 (.77)	4.46 (.87)	4.54 (.95)

Specifically, one principal component was extracted from all items to represent Level 1 of the hierarchy in each group. Next, two principal components were extracted from all items to represent Level 2, and so on. Regression-based factor scores were saved at each level and later correlated to provide "path estimates" between contiguous levels of the hierarchy, allowing for an examination of how higher levels deconstruct into lower levels. We were primarily interested in the higher order hierarchical structure of childhood personality; thus, results are presented for Levels 1–5 from each analysis, with the top six items defining each component presented (see Figures 1–5). All analyses were conducted with SPSS.

Personality Hierarchy Across Countries

A comparison of structures at Level 5 from all countries is presented in Figure 1. Due to space constraints, all five country-specific hierarchies are not represented here, but are available from the first author upon request. Detailed descriptions of these findings are provided below.

Canada.   In each of the following analyses, the single principal component at Level 1 is extracted from all available items. Level 2 of the personality hierarchy for Canadian children indicated two broad components reflecting characteristics of E/O and A/N. Both of these components contributed to a third component reflecting C/O at Level 3, with E/O contributing more variance. At Level 4, E breaks down into E and A. Finally, at Level 5, C/O breaks down into separate C and O components. The final five-factor structure for Canadian children does not contain a "pure" N but rather a component primarily defined by antagonism and disagreeableness as well as a more typical A component. Variance accounted for at Levels 1–5 was 24.25%, 33.63%, 40.99%, 45.14%, and 48.57%, respectively.

China.   Level 2 of the personality hierarchy for Chinese children indicated a typical E component and an N/C component that also included the physical activity characteristics that would typically be expected to load on E. At Level 3, both components contribute to new C/O and E components, with only the Level 2 N/C component contributing to an antagonism-heavy Level 3 A/N factor. At Level 4,

Canadian (n = 392)	Chinese (n = 506)	Greek (n = 572)	Russian (n = 1,374)	American (n = 907)
Component 1				
E	*C/O*	*E*	*E*	*E*
Energetic	Good concentration	Sociable	Energetic	Outgoing
Outgoing	Large vocabulary	Loves to be w/people	Sociable	Loves to be w/people
Loves to be w/people	Careful	Makes friends easily	Makes friends easily	Energetic
Sociable	Short attention span (rc)	Cheerful	Physically active	Friendly
Lively/enthusiastic	Quick to learn	Lively/enthusiastic	Always on the move	Happy
Makes friends easily	Unimaginative (rc)	Energetic	Lively/enthusiastic	Makes friends easily
Component 2				
A/N	*A*	*A/N*	*A/N*	*A/N*
Irritable	Loving	Quick tempered	Irritable	Rude
Angry easily	Thoughtful of others	Stubborn	Quick tempered	Selfish
Quick tempered	Considerate	Hardheaded	Aggressive	Mean
Complains	Helpful	Wants things own way	Rude	Quick tempered
Moody	Quick to understand	Rude	Whiny	Aggressive
Disrespectful	Caring	Angry easily	Angry easily	Angry easily
Component 3				
O	*E*	*C*	*A*	*O*
Thinking abilities	Outgoing	Organized	Sensitive	Quick to learn
Quick to learn	Withdrawn (rc)	Careful	Loving	Large vocabulary
Intelligent	Lively/enthusiastic	Neat and tidy	Caring	Good thinking abilities
Large vocabulary	Loves to be w/people	Responsible	Thoughtful	Intelligent
Quick to understand	Talkative	Perfectionist	Joy to be with	Good memory
Speaks well	Makes friends	Drive to do better	Helpful	Quick to understand
Component 4				
A	*N*	*O*	*C*	*N*
Thoughtful	Easily upset	Quick to learn	Self-disciplined	Lacks confidence
Sensitive	Quick tempered	Quick to understand	Good concentration	Afraid of lots
Caring	Insecure	Thinking abilities	Organized	Feelings hurt
Loving	Irritable	Good memory	Careful	Fearful
Considerate	Feelings hurt	Intelligent	Responsible	Difficulty adjusting
Sweet	Afraid of lots	Slow to learn (rc)	Neat and tidy	Needs help w/lots
Component 5				
C	*A/N*	*N*	*O*	*C*
Organized	Strong willed	Feelings hurt	Thinking abilities	Organized
Self-disciplined	Hardheaded	Easily upset	Good memory	Neat and tidy
Neat and tidy	Stubborn	Afraid of lots	Large vocabulary	Careful
Disorganized	Gives in to others (rc)	Whiny	Intelligent	Responsible
Responsible	Interested in new things	Fearful	Interested in new things	Dependable
Hard worker	Disobedient	Sensitive to others	Asks questions	Self-disciplined

Figure 1
Comparison of Level 5 components from country-based samples.

both C/O and E contribute to a new "typical" A component. Finally, at Level 5, the antagonism A/N component breaks down into separate antagonism and N components. In the Chinese sample, we again see both a "typical" A and an antagonism A/N component represented. At Level 5, Chinese parents are not differentiating between C and O. In addition, component 5, the antagonism A/N, is weakly supported, with only six items loading substantially on this component. Variance accounted for at Levels 1–5 was 18.49%, 26.84%, 33.07%, 37.03%, and 39.96%, respectively.

Greece.   Level 2 of the personality hierarchy for Greek children indicated two broad components reflecting E/O and antagonism A/N. At Level 3, a C/O component breaks apart from both E/O and A/N, which contribute roughly equivalent amounts of variance. At Level 4, N weakly breaks off from E, as evidenced by a small positive correlation between these two components. This N component also includes typical Agreeableness items such as "considerate" and "thoughtful" alongside N items reflecting sensitivity and fearfulness. Finally, at Level 5, C/O separates into distinguishable C and O components. Variance accounted for at Levels 1–5 was 20.07%, 30.16%, 36.06%, 40.90%, and 43.18%, respectively.

Russia.   Level 2 of the personality hierarchy for Russian children indicated two broad components reflecting E/O and A/N. At Level 3, A/N breaks into A/C and an antagonism-heavy A/N. At Level 4, A/C breaks into C/O and a typical A component. Finally, at Level 5, C/O breaks apart into distinguishable C and O components. For Russian children, we again see an antagonism A/N rather than a typical N component. Variance accounted for at Levels 1–5 was 20.73%, 29.06%, 34.75%, 38.55%, and 41.05%, respectively.

United States.   Level 2 of the personality hierarchy for American children indicated two broad components reflecting O/E and A/N. At Level 3, both components contribute to a C/O component, with Level 2 O/E contributing more variance. At Level 4, the E and A/N components contribute to an N component. Finally, at Level 5, C/O separates into distinguishable C and O components. At Level 5 in American children, we do see a typical N component as well as the antagonism A component; however, no typical A component emerged. Variance accounted for at Levels 1–5 was 23.62%, 32.60%, 37.52%, 41.76%, and 43.99%, respectively.

Procrustes rotation.   In order to provide empirical criteria for evaluating the similarity of factor structures across countries, Procrustes rotation was employed to compare the Level 5 structures across groups. As the ICID was initially developed in a U.S. sample, the U.S. sample was selected as the target factor structure, each of the other four countries was rotated to this target structure for those factors appearing across both groups, and factor congruence coefficients were calculated (see Table 2). Following recommendations by

Table 2
Factor Congruence Coefficients From Orthogonal Procrustes Rotation of Level 5 Components

Target: U.S. Sample	Comp. 1: E	Comp. 2: A/N	Comp. 3: O	Comp. 4: N	Comp. 5: C
Canada	0.97	0.97	0.97	*	0.90
China	0.93	0.90	0.89	0.87	*
Greece	0.95	0.95	0.94	0.93	0.89
Russia	0.96	0.94	0.95	*	0.88

	Comp. 1: E	Comp. 2: C/A	Comp. 3: A/N	Comp. 4: O	Comp. 5: N
Target: 3–5-year-olds					
6–8-year-olds	0.99	0.98	0.98	0.95	0.85
9–11-year-olds	0.99	0.97	0.94	0.87	0.25
12–14-year-olds	0.98	0.97	0.92	0.86	*
Target: 6–8-year-olds					
9–11-year-olds	0.99	0.95	0.93	0.88	0.81
12–14-year-olds	0.98	0.95	0.95	0.89	*
Target: 9–11-year-olds					
12–14-year-olds	0.98	0.97	0.98	0.98	*

Note. E = Extraversion; A = Agreeableness; N = Neuroticism; O = Openness to Experience; C = Conscientiousness. * indicates that a component with directly comparable content was not extracted at Level 5.

Fischer and Fontaine (2011), values lower than 0.85 are interpreted as indicating factor incongruence, with desirable congruence coefficients falling at 0.95 or higher. Comparisons revealed adequate to good average factor congruence coefficients for all samples: Canada (0.95), China (0.90), Greece (0.93), and Russia (0.93). When a directly comparable component was not extracted in both countries, no congruence coefficient was available. For example, the fourth component extracted in the U.S. sample was primarily defined by items reflecting N, whereas a similar component was not extracted for Canadian or Russian children.

Personality Hierarchy Across Development

Ages 3–5. Level 2 of the personality hierarchy for 3–5-year-old children indicated two broad components reflecting characteristics of O/E and A/N, respectively (see Figure 2). The first component broke off to form separate components reflecting C and E at Level 3. At Level 4, C breaks down into C and O. Finally, at Level 5, both E and A/N contribute to a separate N component. Variance accounted for at Levels 1–5 was 20.11%, 27.94%, 33.27%, 36.90%, and 39.74%, respectively.

Ages 6–8. Level 2 of the personality hierarchy for 6–8-year-old children similarly indicated two broad components reflecting E/O and A/N, respectively (see Figure 3). At Level 3, both components contribute to a separate C component. At Level 4, the C component breaks into C/O and a new "typical" A component, with C items also loading on this component. The transition from Level 4 to Level 5 is straightforward for E and O, with a more complicated pattern emerging for the remaining components. A face-valid C component breaks off of A at Level 4. Both A/N and A at Level 4 contribute to an antagonistic A/N component and an N component at Level 5. Variance accounted for at Levels 1–5 was 19.85%, 28.56%, 34.17%, 38.23%, and 40.96%, respectively.

Ages 9–11. Level 2 of the personality hierarchy for 9–11-year-old children was again consistent with earlier ages, in that two broad components reflecting E/O and A/N emerged (see Figure 4). At Level 3, an O/C component breaks apart from both E/O and A/N. At Level 4, N weakly breaks off from both E and A/N. Finally, at Level 5, O

Level 1
All personality items

.92

Level 2

Component 1: O/E
Thinking abilities
Interested in new things
Intelligent
Curious
Lively/enthusiastic
Energetic

−.40

Component 2: A/N
Quick tempered
Irritable
Selfish
Disobedient
Aggressive
Rude

Level 3

Component 1: C
Hard worker
Responsible
Self-disciplined
Drive to do better
Thoughtful
Dependable

.64   .77   .95

Component 2: E
Outgoing
Sociable
Lively/enthusiastic
Energetic
Active physically
Withdrawn (rc)

Component 3: A/N
Irritable
Quick tempered
Angry easily
Hardheaded
Selfish
Whiny

Level 4

Component 1: E
Outgoing
Sociable
Energetic
Lively/enthusiastic
Active physically
Loves to be w/people

.97   .95   .98   .32

Component 2: A/C
Thoughtful
Dependable
Considerate
Self-disciplined
Responsible
Obedient

Component 3: A/N
Quick tempered
Irritable
Hardheaded
Selfish
Angry easily
Whiny

Component 4: O
Difficulty problem solving (rc)
Large vocabulary
Good concentration
Slow to learn (rc)
Quick to learn
Easily distracted (rc)

Level 5

Component 1: E
Outgoing
Active physically
Sociable
Lively/enthusiastic
Always on the move
Talkative

.95   .98   .95   .99   −.30   .32

Component 2: C/A
Self-disciplined
Dependable
Responsible
Considerate
Obedient
Thoughtful

Component 3: A/N
Quick tempered
Hardheaded
Irritable
Aggressive
Mean
Angry easily

Component 4: O
Large vocabulary
Good concentration
Difficulty problem solving (rc)
Quick to learn
Slow to learn (rc)
Easily distracted (rc)

Component 5: N
Easily upset
Difficulty adjusting
Insecure
Slow to warm up
Feelings hurt
Difficulty making friends

Figure 2

Hierarchical structure of childhood personality from caregiver ratings of children ages 3–5 (n = 908).

Level 1
All personality items
.82

Level 2
Component 1:   *E/O*
Lively/enthusiastic
Energetic
Thinking abilities
Interested in new things
Makes friends
Curious

−.57

Component 2:   *A/N*
Disobedient
Rude
Obedient (rc)
Disrespectful
Hardheaded
Quick tempered

.52   −.54

Level 3
Component 1:   *C*
Drive to do better
Careful
Hard worker
Good concentration
Responsible
Dependable

.85

Component 2:   *E*
Lively/enthusiastic
Energetic
Talkative
Sociable
Makes friends
Outgoing

.82

Component 3:   *A/N*
Irritable
Quick tempered
Hardheaded
Angry easily
Selfish
Rude

.73   .99

Level 4
Component 1:   *E*
Lively/enthusiastic
Energetic
Talkative
Makes friends easily
Sociable
Active physically

.99

Component 2:   *C/O*
Good concentration
Quick to learn
Thinking abilities
Eager to learn
Careful
Problem solving

.68

Component 3:   *A/N*
Irritable
Quick tempered
Angry easily
Hardheaded
Complains
Whiny

Component 4:   *A/C*
Thoughtful of others
Loving
Sweet
Obedient
Dependable
Considerate

.93   .81

Level 5
Component 1:   *E*
Lively/enthusiastic
Energetic
Makes friends
Talkative
Sociable
Loves to be w/people

.98

Component 2:   *O*
Good thinking abilities
Quick to learn
Large vocabulary
Good concentration
Good memory
Intelligent

.81   −.38

Component 3:   *C*
Self-disciplined
Dependable
Obedient
Responsible
Hard worker
Considerate

.41

Component 4:   *A/N*
Hardheaded
Mean
Rude
Quick tempered
Aggressive
Irritable

.58

Component 5:   *N*
Feelings hurt
Easily upset
Afraid of lots
Lacks confidence
Complains
Whiny

Figure 3

Hierarchical structure of childhood personality from caregiver ratings of children ages 6–8 (n = 874).

Level 1
All personality items

.84 → −.54

Level 2

Component 1: E/O
Lively/enthusiastic
Sense of humor
Thinking abilities
Intelligent
Loves to be w/people
Energetic

Component 2: A/N
Disobedient
Quick tempered
Rude
Angry easily
Irritable
Selfish

.86 / .49

Level 3

Component 1: E
Loves to be w/people
Sociable
Makes friends easily
Lively/enthusiastic
Energetic
Cheerful

Component 2: C/O
Good concentration
Drive to do better
Quick to learn
Careful
Thinking abilities
Eager to learn

Component 3: A/N
Quick tempered
Irritable
Angry easily
Wants things own way
Selfish
Rude

.87   −.48   .99

Level 4

Component 1: E
Loves to be w/people
Sociable
Lively/enthusiastic
Makes friends easily
Energetic
Cheerful

Component 2: C/O
Good concentration
Quick to learn
Drive to do better
Carefully w/thought
Thinking abilities
Large vocabulary

Component 3: A/N
Quick tempered
Selfish
Rude
Irritable
Angry easily
Wants things own way

Component 4: N
Afraid of lots
Feelings hurt
Fearful
Lacks confidence
Insecure
Easily upset

.99   (.19)   (−.14)   .99

Level 5

Component 1: O
Thinking abilities
Quick to learn
Large vocabulary
Intelligent
Good concentration
Eager to learn

Component 2: E
Energetic
Always on the move
Sociable
Active physically
Lively/enthusiastic
Loves to be w/people

Component 3: A/N
Rude
Selfish
Irritable
Quick tempered
Angry easily
Aggressive

Component 4: C
Organized
Neat and tidy
Disorganized
Untidy
Careful
Perfectionist

Component 5: N
Afraid of lots
Feelings hurt
Lacks confidence
Fearful
Needs help w/lots
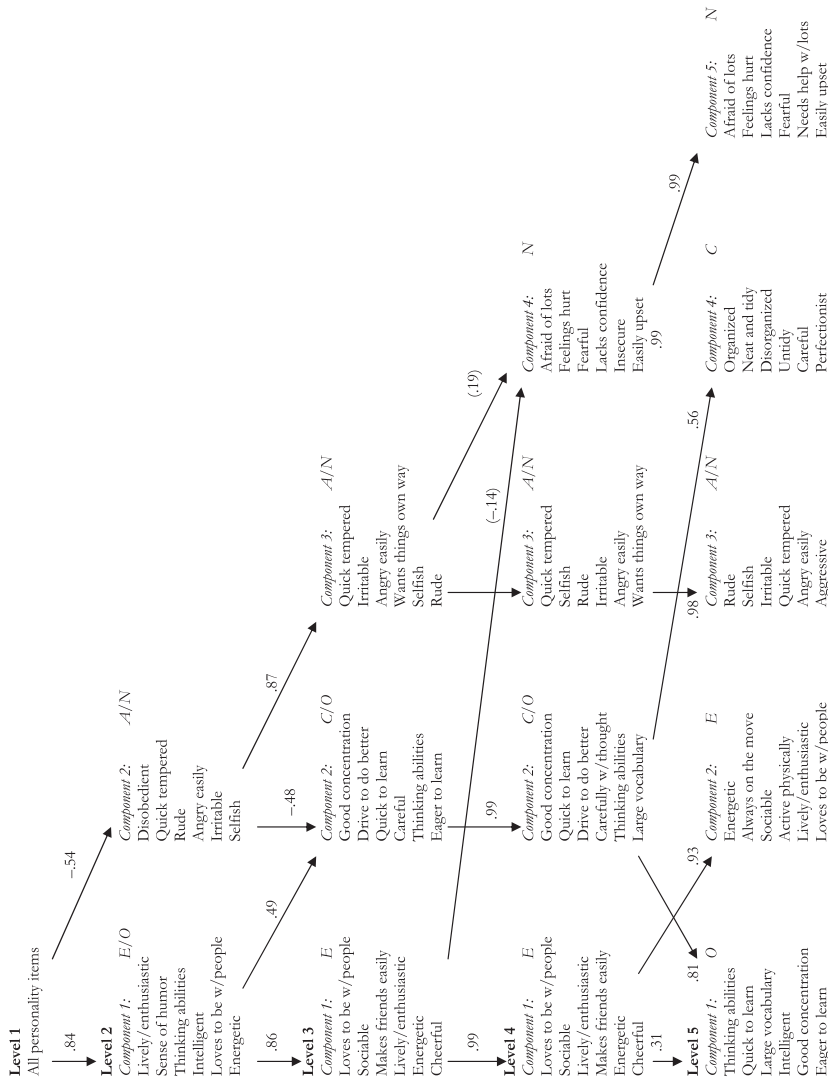Easily upset

.81   .93   .31   .98   .56   .99

Figure 4

Hierarchical structure of childhood personality from caregiver ratings of children ages 9–11 (n = 1,302).

and C split apart, with Level 4 E contributing some variance to O as well. Variance accounted for at Levels 1–5 was 22.28%, 31.37%, 36.42%, 40.85%, and 43.34%, respectively.

Ages 12–14.   Level 2 of the personality hierarchy for 12–14-year-olds also demonstrated evidence for E/O and A/N, achieving robust replication across childhood development at this level (see Figure 5). At Level 3, C breaks off from both E/O and A/N, with Level 2 E/O contributing more variance. At Level 4, C breaks into C and A. At Level 5, E, A, C, and A/N are retained, whereas both C and E at Level 4 contribute to a new O component. Variance accounted for at Levels 1–5 was 24.73%, 33.15%, 38.47%, 43.18%, and 45.37%, respectively.

Procrustes rotation.   Procrustes rotation was again employed to compare the Level 5 structures across age groups. As there was no clear target sample, all possible pair-wise comparisons were performed across age groups (see Table 2). Using the 3–5-year-old sample as the target, average congruence coefficients were 6–8 (0.95), 9–11 (0.80), and 12–14 (0.93). Using the 6–8-year-old sample as the target, average congruence coefficients were 9–11 (0.91) and 12–14 (0.94). Finally, comparing the 12–14-year-old sample to the target sample of 9–11-year-olds produced an average congruence coefficient of 0.98. When a directly comparable component was not extracted in both age groups, no congruence coefficient was available.

DISCUSSION

This study provides the first examination of the hierarchical structure of childhood personality across five different countries and four age groups. Overall, more similarities were found than differences across both country and age. For all countries and age groups, the general traits extracted at Levels 2–5 map onto established patterns for children and adults (Markon et al., 2005; Tackett et al., 2008). That is, in all analyses, Level 2 typically reflected a difference in approach-related characteristics versus avoidance and regulatory characteristics (DeYoung, 2006; Digman, 1997; Read et al., 2010). Level 3 reflected components resembling effortful control, positive emotionality, and negative emotionality (Rothbart et al., 2001). Level 4
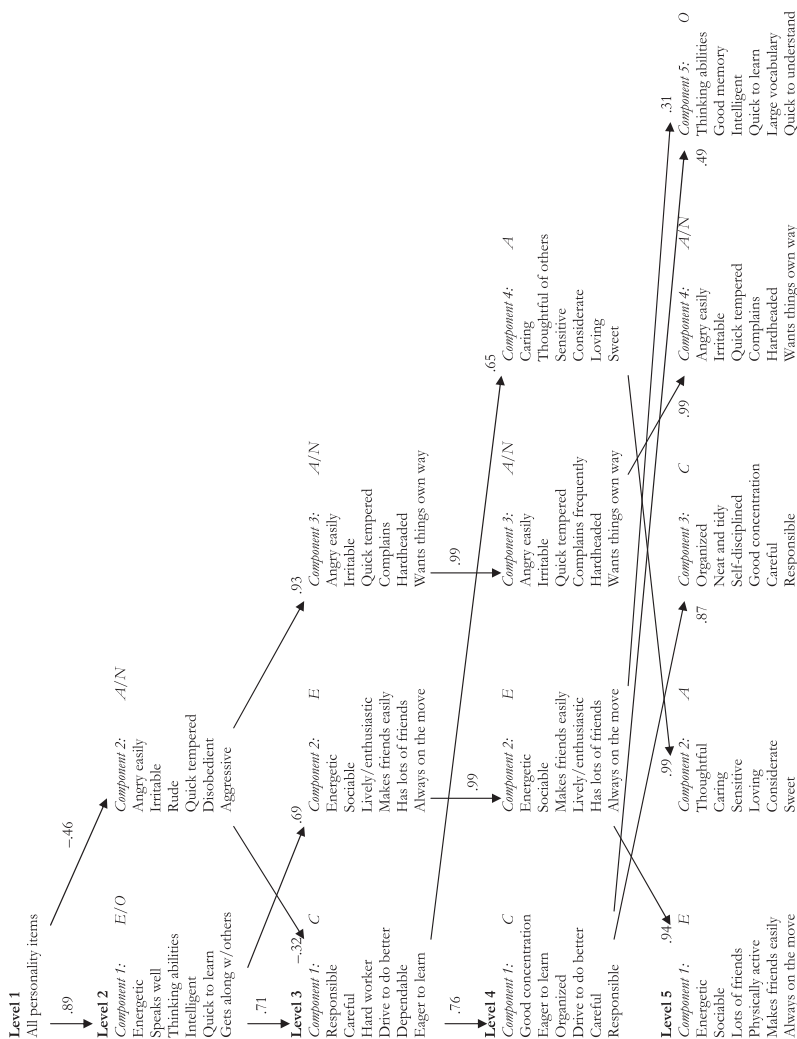
Level 1
All personality items

.89   −.46

Level 2

Component 1: E/O
Energetic
Speaks well
Thinking abilities
Intelligent
Quick to learn
Gets along w/others

Component 2: A/N
Angry easily
Irritable
Rude
Quick tempered
Disobedient
Aggressive

Level 3
.71   −.32   .69   .93

Component 1: C
Responsible
Careful
Hard worker
Drive to do better
Dependable
Eager to learn

Component 2: E
Energetic
Sociable
Lively/enthusiastic
Makes friends easily
Has lots of friends
Always on the move

Component 3: A/N
Angry easily
Irritable
Quick tempered
Complains
Hardheaded
Wants things own way

Level 4
.76   .99   .99   .65

Component 1: C
Good concentration
Eager to learn
Organized
Drive to do better
Careful
Responsible

Component 2: E
Energetic
Sociable
Makes friends easily
Lively/enthusiastic
Has lots of friends
Always on the move

Component 3: A/N
Angry easily
Irritable
Quick tempered
Complains frequently
Hardheaded
Wants things own way

Component 4: A
Caring
Thoughtful of others
Sensitive
Considerate
Loving
Sweet

Level 5
.94   .99   .87   .99   .31   .49

Component 1: E
Energetic
Sociable
Lots of friends
Physically active
Makes friends easily
Always on the move

Component 2: A
Thoughtful
Caring
Sensitive
Loving
Considerate
Sweet

Component 3: C
Organized
Neat and tidy
Self-disciplined
Good concentration
Careful
Responsible

Component 4: A/N
Angry easily
Irritable
Quick tempered
Complains
Hardheaded
Wants things own way

Component 5: O
Thinking abilities
Good memory
Intelligent
Quick to learn
Large vocabulary
Quick to understand

Figure 5

Hierarchical structure of childhood personality from caregiver ratings of children ages 12–14 (n = 649).

generally resembled the FFM without a separate O factor, whereas at Level 5 all five factors were typically represented. Some deviations from previous findings were also observed, as discussed below.

Childhood Personality Structure Across Cultures

The countries that would typically be characterized as individualistic (i.e., Canada and the United States) were largely similar to one another and more similar to previous findings than the collectivistic countries (i.e., China and Russia). Although Greece is typically ranked between largely individualistic and collectivistic cultures, it is ranked more similarly to collectivistic cultures (Hofstede, 2001; Suh et al., 1998). Yet, in these findings, the hierarchical structure of Greek children appeared to more closely resemble that of Canadian and American children. These overall similarities are also reflected when examining factor congruence coefficients between countries at Level 5 of the hierarchy, which support good overall replication of Level 5 traits across samples. In particular, E, A/N, and O showed the most robust replication across countries, with less robust replication for pure N and C traits.

One interesting finding is that the pattern of covariation for O was identical in all three individualistic countries. Specifically, O characteristics covaried with E at Level 2 but shifted to C for Levels 3 and 4 in Canada, Greece, and the United States. These findings were not expected based on the adult literature, but derive some support from other childhood personality findings. C and O in childhood have been linked to academic achievement in several studies, for example (Barbaranelli et al., 2003; John et al., 1994; Mervielde, Buyst, & De Fruyt, 1995), and previous research on childhood personality has found stronger relationships between C and O than would be expected in adult samples (De Pauw et al., 2009; Goldberg, 2001). The predominance of intellect features for O at early ages may be the factor that explains this stronger covariation (Gjerde & Cardilla, 2009). One study of adolescents (ages 12–17) found strong evidence for a factor consisting of both Openness to Experience and intellect, although relations between these scales and an adult O measure were stronger with O than intellect, suggesting that adult personality measures may not cover the intellect domain as thoroughly (De Fruyt et al., 2000). Specifically, such results suggest that bottom-up measures of childhood personality may find intellect features to play a

more primary role in personality structure than they do in adult measures. The relation between childhood measures of O and adult personality are complex. Some findings have suggested differential relations depending on gender, such that child O predicts adult O for females, whereas in males child O is a stronger predictor of adult C (Gjerde & Cardilla, 2009). Thus, the role of early intellect, imagination, and curiosity may hold different predictive power for males and females. Further, these aspects may be stronger representations of O in early life than in adulthood, a topic that should be studied in future research.

Shifting our focus to the other countries, the pattern seen for the children in China (ranked most collectivistic) is particularly interesting. This is the only country where separate components for C and O did not emerge at Level 5; rather, they appear to represent a unified factor even at this level. This is also reflected when comparing this component to the O component in the U.S. sample, with a factor congruence coefficient of 0.89. This is somewhat consistent with previous cross-cultural research that has often failed to find a robust O analog in non-Western samples (e.g., Cheung et al., 2001). Similarly, in the Russian sample, the O characteristics did not play a particularly prominent role at higher levels of the hierarchy, with no items of O appearing as substantial loadings on the components at Level 3. By Level 5, however, the factor congruence coefficient suggests that a largely replicated O factor did emerge in the Russian sample.

Childhood Personality Structure Across Ages

Turning to the results across age groups, the hypothesis that Levels 2 and 3 would be robust across age was supported. Somewhat surprisingly, however, was the finding that Levels 4 and 5 were largely consistent across age as well. Even in the youngest age group, the four- and five-factor structures look very similar to those found in adult samples. Some interesting inconsistencies emerged as well. Examination of factor congruence coefficients between age groups for Level 5 components suggest that a pure N component showed the most difficulty in replication across ages. This may be due, in part, to the difficulty in measuring more internal aspects of N (e.g., sadness, anxiety, insecurity) in children when relying on informant reports.

We also observed a shifting pattern for C, such that in the younger age groups (3–5 years and 6–8 years), C is predominantly loading with A characteristics reflecting the previously described "agreeable compliance" (DePauw & Mervielde, 2010; Tackett et al., 2008). With the older age groups (9–11 years and 12–14 years), we see a much cleaner differentiation of C and A characteristics such that C and A items are not covarying as tightly at higher levels of the hierarchy. This is consistent with the broad disconstraint factor that is primarily represented in temperament models and thought to subsume aspects of both C and A (Rothbart et al., 2001). These findings suggest that A and C do tightly covary at younger ages, which may represent a true lack of differentiation between A and C in early childhood or may be a result of measurement limitations (or both). For example, many aspects of C may not be salient until the child is fully immersed in the academic setting that primary school provides. It may be that early childhood environments restrict opportunities for such traits to manifest. Nonetheless, by Level 5, the emergent C trait (whether primarily C or still including some A items as well) showed robust replicability across age groups, suggesting good continuity in measurement of this trait across time. Future work using multiple informants and methods of measurement should aim to disentangle measurement bias from true variance in these traits.

Contributions to Conceptualizations of Childhood Personality

Similar to research findings with adults, this study supports a robust hierarchical trait structure of child personality across age groups and cultures. This vast replicability, with more similarities than differences across groups, provides further support for hierarchy as an inherent and important aspect of personality structure (Markon, 2009). Establishing trait hierarchy allows for a number of theoretical and practical implications. The robust nature of superordinate traits is easily integrated with major causal and explanatory theories of trait structure. For example, rich explanatory theories have been developed for the "Big Two" (seen here at the second level of the hierarchy), connecting these broad traits to neurobiological (Markon, 2009) and motivational (Read et al., 2010) systems that may serve to link causal factors, mediating processes, traits, and behavior. Importantly, these findings support the search for such explanatory pathways from early childhood through adulthood. In

addition, these results suggest that future investigations on underlying explanatory processes may be best served by extracting even higher levels of superordinate traits from existing measures in order to provide continuity and to ease interpretation of results across studies.

One fairly robust finding that deviates from previous research with adults is the salient role of antagonism in these models. Across ages, we see that emergence of typical A (e.g., marked by empathy, compassion, and modesty) and typical N (e.g., marked by sadness and depression) traits is hard to find in these childhood data. Instead, the antagonistic features associated with both A and N emerge early (i.e., at Level 2) and remain a very salient trait that parents use to differentiate their children. This is consistent with the extensive literature on the "difficult temperament" construct, which sometimes incorporates both negative affectivity and behavioral resistance or oppositionality (Tackett, 2006). A "typical" N emerges by Level 5 for ages 3–5, 6–8, and 9–11, yet a "typical" A does not. The A at Level 5 for these ages is still largely reflecting antagonism. The pattern reverses in the oldest group, the 12–14-year-olds, where we finally see a "typical" A at Level 5, although negative affectivity is still primarily defined by antagonism rather than sad or anxious mood.

These strong links between A and N are not new. The adult temperament model developed by Evans and Rothbart (2007) distinguished between aggressive and nonaggressive negative affect. While nonaggressive negative affect correlated primarily with FFM N, aggressive negative affect correlated substantially with both N and A (inversely) in a college student sample. In recent reviews, the lower order trait of anger-irritability was noted to load differentially at the higher order level depending on the model of childhood personality or temperament, with some temperament measures more commonly assigning it to Neuroticism/negative emotionality, whereas personality measures more often assigned it to Agreeableness (Caspi & Shiner, 2006; De Pauw & Mervielde, 2010). In addition, childhood N is likely the most difficult trait to measure using informant reports, as it is less directly observable than the other traits (Hampson & Goldberg, 2006). Indeed, informant reports of childhood N show the weakest prediction of later self-reported personality relative to other traits (Hampson & Goldberg, 2006; Tackett et al., 2008). These findings suggest that antagonistic aspects of N may be more easily identifiable at earlier ages than other facets of this

domain. As children move into adolescence, negative affectivity increases (Carstensen, Pasupathi, Mayr, & Nesselroade, 2000), but the parental exposure to this is likely to be primarily in the form of antagonism. Youth are beginning to establish autonomy from their parents at this developmental stage and may be less likely to share their inner feelings and experiences related to depression and anxiety.

This study investigated the hierarchical structure of childhood personality using a large pool of items from an existing measure that maps onto a five-factor structure (Halverson et al., 2003). Recent researchers examining the joint structure of temperament and personality have suggested the possibility of a six-factor model to incorporate both personality and temperament domains (De Pauw et al., 2009; De Pauw & Mervielde, 2010). Specifically, De Pauw and Mervielde (2010) recommend a distinct Activity domain at the higher order level that is separate from E and is not present in adult personality models. Other taxonomic approaches define Activity as a subcomponent of E (Caspi et al., 2005). Importantly, Activity showed poor congruence across samples of Russian, Slovenian, and U.S. children (Knyazev et al., 2008), so more research investigating the cross-cultural generalizability of this trait is needed. Given the incipient nature of this research area, future investigations more broadly tapping the joint domains covered by temperament and personality models will be necessary to further understand the structure of childhood personality across ages. Temperament research has much to offer investigations of childhood personality, including an extensive literature with attention to developmental processes and the biological substrates of traits (Rothbart et al., 2000). Future work in this area should continue to move toward further integration of temperament and personality at early ages.

One important contribution this study makes is an examination of personality across countries and ages from the perspective of structure and item-level covariation rather than mean trait levels. Much of the existing adult work examining cross-cultural differences in personality has focused on mean-level differences, an approach that involves a number of limitations regarding validity (Heine & Buchtel, 2009). Examination of covariation patterns allows a look at cross-country differences from a different angle, potentially avoiding some of the previous pitfalls. For example, mean-level differences may be more influenced by biases such as cultural reference groups, whereas item-level covariation is examining relative patterns rather

than absolute values; thus, comparisons across groups may be less influenced by such reporting biases.

Limitations

One limitation of this study is the reliance on parental report, primarily from the mother. Development of valid and reliable self-report measures of childhood personality has been slow, due to the inherent social-cognitive and intellectual limitations in early stages of development (Markey, Markey, Tinsley, & Ericksen, 2002). Researchers have begun identifying potentially fruitful methods of assessing child personality via self-report (e.g., Brown, Mangelsdorf, Agathen, & Ho, 2008; Eder, 1990; Markey et al., 2002; Measelle, John, Ablow, Cowan, & Cowan, 2005), although many are quite resource-intensive. Even at relatively late stages of childhood development (10–12 years of age), self-reports are potentially problematic, with lower reliabilities than parent report (Markey et al., 2002). In addition, acquiescent responding is more prevalent in later childhood and decreases substantially from age 10 to late adolescence (Soto et al., 2008).

Parent reports have certain advantages regarding their psychometric properties, and it is important to note that they appear to provide converging evidence with child self-reports. Previous research examined factor congruence coefficients for parent and self-report of early adolescents on the ICID lower order scales and found a highly comparable structure for both parent and self-report, with the exception of the Activity scale (Knyazev et al., 2008). Further, parent and self-report are correlated in early adolescence for all traits (Markey et al., 2002). These findings suggest that parental reports of childhood personality do contain valid information about early individual differences (Rothbart & Bates, 2006), although such work would still be strengthened by the future use of multiple informants and methods. It is also likely that parent and teacher informants are better assessors of certain childhood personality traits than others. For example, both parent and teacher ratings of C and E showed the highest prediction of the analogous traits self-reported in later life (Hampson & Goldberg, 2006; Tackett et al., 2008) in comparison to other traits. Such findings could demonstrate higher stability of C and E over time, but they could also reflect more accurate measurement of these traits when relying on parent and teacher ratings for

childhood personality (see also Measelle et al., 2005). Thus, a more intensive and detailed approach to measuring childhood personality should involve a combination of informants (e.g., self, mother, father, teacher, peer) to more accurately assess the full range of traits.

Another limitation of the current study is the absence of a refined measure of culture and the ability to examine the dimensions of age and culture independently of one another. The countries examined here represent both individualistic and collectivistic cultures, but culture is more complex than simply country of origin (Kotelnikova & Tackett, 2010). Furthermore, the country-based samples in the present article were collected independently, restricting the availability of standardized demographic information (e.g., ethnicity) across samples. More careful attention to the role that culture plays in childhood personality and personality development may offer important insight into what may be the most important environmental influence on personality traits (Super & Harkness, 2002). Little cross-cultural work on childhood personality has been conducted, and this remains an important and exciting area of future study. In addition to examining cross-cultural differences in emergent personality, potential cultural differences in informants and methods must also be considered. One study investigated the values that mothers from Greece, Taiwan, and the United States wished to instill in their children and found some interesting differences (Tamis-LeMonda, Wang, Koutsouvanou, & Albright, 2002). Greek mothers emphasized values such as honesty and spirituality, Taiwanese mothers emphasized values such as good manners and obedience, and American mothers emphasized values such as assertiveness and independence as well as values such as sociability and compassion. Similarly, parental perceptions of the same trait may yield different consequences (e.g., reward vs. punishment) across cultures (e.g., Chen et al., 1998), which may lead to differential reporting of mean levels across groups (and differential expression of these traits across development). It is possible that cultural differences such as these may influence parent reports of childhood personality across cultures.

CONCLUSION

This study provides the strongest evidence to date regarding the universality of hierarchical personality structure in childhood by

incorporating multiple cross-country and cross-age comparisons (Bornstein, 2002). In a large sample of 3,751 children from Canada, China, Greece, Russia, and the United States, robust similarities for childhood personality structure emerged. Differences emerged as well, both across development and across countries, with countries typically classified as individualistic (i.e., Canada and the United States) appearing more similar to one another than to the countries typically classified as collectivistic (i.e., China and Russia). In these samples, the Greek children appeared more similar to the individualistic than the collectivistic samples. Taken together, these results help explain previous differences in temperament and childhood personality research, including the strong emergence of a robust three-factor structure and the concept of "difficult temperament," which incorporates both negative emotionality and (dis)agreeableness in childhood. Further, support was found for an FFM from early childhood through early adolescence that appears largely analogous to the established FFM in adult populations. These findings will help to integrate child temperament and personality research with research on adults, resulting in a useful refinement of theoretical conceptions and opening up future avenues for child personality research.

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