Assessment

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What is This?

Delineating Personality Traits in Childhood and Adolescence: Associations Across Measures, Temperament, and Behavioral Problems

Jennifer L. Tackett[1], Shauna C. Kushner[2], Filip De Fruyt[3], and Ivan Mervielde[3]

Abstract

The current investigation addressed several questions in the burgeoning area of child personality assessment. Specifically, the present study examined overlapping and nonoverlapping variance in two prominent measures of child personality assessment, followed by tests of convergent and divergent validity with child temperament and psychopathology. Informant report (72.1% mother) was obtained for a community sample of 803 youth (M_{age} = 11.34 years; 51.6% female). The results revealed strong convergence between two empirically based measures of child personality traits, although some discrepancies were noted. The results from analyses predicting temperament and psychopathology were complex, suggesting that higher order child personality traits account for both shared and unique variance in these constructs, relative to one another. Overall, the current investigation provides a multifaceted contribution to evidence for construct validity of child personality traits and highlights the need for subsequent research in this area.

Keywords

child personality, temperament, psychometrics, construct validity

The study of personality traits—that is, broad dimensions indexing individual differences in thoughts, feelings, and behavior—has seen great advances in research and theory in recent decades. The focus of recent expansions have been an increased recognition of personality trait emergence in early life and the need for a better understanding of early personality trait conceptualization (De Pauw & Mervielde, 2010; Shiner & Caspi, 2003; Soto, John, Gosling, & Potter, 2008; Tackett, Slobodskaya, et al., 2012). Researchers have demonstrated that personality traits resembling, but not equivalent to, the widely known five-factor model (FFM) in adults can be measured in children (Digman, 1989; Goldberg, 2001; Halverson et al., 2003; Mervielde & De Fruyt, 1999). In addition, robust empirical evidence now exists for stability of early traits across time and the importance of child personality traits for predicting a host of consequential outcomes (De Fruyt et al., 2006; Hampson, 2008; Shiner & Caspi, 2003). Amid this growing area of research, the time is right to take stock of current evidence for the construct validity of major personality traits in childhood (see the seminal early effort by Shiner, 1998). The present study aims to address this goal by exploring the boundaries of major personality traits in childhood and adolescence by investigating youth personality trait associations across measures, their associations with higher order traits of temperament, and the predictive validity of childhood personality traits for youth psychopathology.

Current Measurement of Child Personality

Although interest in the study of child personality has been growing for some time now, empirical research has been substantially limited by the lack of psychometrically sound child personality measures (Kohnstamm, Halverson, Mervielde, & Havill, 1998; Shiner & Caspi, 2003; Tackett, 2006). Much of the early work in this domain has used adult personality measures that were "adapted down" for use with children (e.g., Goldberg, 2001; John, Donahue, & Kentle, 1991; Soto, John, Gosling, & Potter, 2011; Tackett, Krueger, Iacono, & McGue, 2008) or created new measures based on available data from archival datasets (Caspi, Henry, McGee, Moffitt, & Silva, 1995; Friedman et al., 1993; Kern, Hampson, Goldberg, & Friedman, 2013). These studies have made great strides in establishing the relevance of child personality and, despite these measurement limitations, are also notable in the remarkable

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convergence that has emerged among them regarding the higher order structure of child personality. Nonetheless, the study of child personality must move forward with a better understanding of child personality trait content in its own right, rather than assuming that child personality traits are identical to those measured in adults. Practically speaking, the field has historically been in great need of psychometrically sound, empirically validated tools for measuring child personality that can be implemented in both research and applied settings and of a better sense of how existing measures are related to one another.

A group of researchers from seven countries joined forces in the 1990s to lead the largest, most concentrated effort to date to develop an empirically based taxonomy for child personality (Kohnstamm et al., 1998). These collaborative efforts were initially aimed at collecting and analyzing parental free descriptions of their children based on open-ended interviews. In an intensive and impressive effort, parents of 2,416 youth from Belgium, China, Germany, Greece, the Netherlands, Poland, and the United States provided free descriptors of their children, which were coded, categorized, and extensively analyzed (Kohnstamm et al., 1998). Although no single measure culminated from this initial effort, it set the stage for the first generation of empirically based child personality measures to emerge (notably later than the emergence of empirically based *temperament* measures for children). Specifically, at least three separate instruments were developed to measure child personality traits, all of which were derived in some part from these initial combined efforts. Two of these—the Hierarchical Personality Inventory for Children (HiPIC; Mervielde & De Fruyt, 1999) and the Inventory for Child Individual Differences (ICID; Halverson et al., 2003)— represent the focus of the current investigation (see also Victor, Rothbart, Baker, & Tackett, 2013, for details regarding the third measure, the Child Temperament and Personality Questionnaire). In particular, although these measures are gaining popularity in early studies of child individual differences, no study to date has examined empirical associations between the HiPIC and ICID. This lack of empirical evidence limits the extent to which results can be interpreted across studies using each measure and currently hinders the emergence of an overarching understanding of child personality traits, their development, and their correlates.

The HiPIC comprises 18 lower order facets (Shyness, Expressiveness, Optimism, Energy, Egocentrism, Compliance, Dominance, Altruism, Achievement, Orderliness, Concentration, Persistence, Anxiety, Self-Confidence, Creativity, Curiosity, and Intellect), which are aggregated into 5 higher order traits of child personality: Neuroticism, Extraversion, Imagination, Benevolence, and Conscientiousness (Mervielde & De Fruyt, 1999). The HiPIC items were compiled using brief, sentence format

parental descriptions of a Flemish sample of children. Studies conducted with the original Dutch language version of the HiPIC have shown strong support for structural validity, interrater agreement, internal consistency, and temporal stability (De Fruyt, Mervielde, & Van Leeuwen, 2002; Mervielde & De Fruyt, 2002). The ICID comprises 15 lower order facets (Sociability, Shyness, Activity Level, Positive Emotions, Antagonism, Strong Willed, Negative Affect, Considerate, Compliant, Organized, Achievement Orientation, Distractible, Fearful/Insecure, Intellect, and Openness), which are aggregated into 5 higher order traits of child personality: Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness (Halverson et al., 2003). The ICID items were compiled using parental descriptions of American, Chinese, Dutch, and Greek samples of children. Studies conducted with the ICID have shown strong support for structural validity, interrater agreement, internal consistency, and temporal stability (Deal, Halverson, Martin, Victor, & Baker, 2007; Halverson et al., 2003; Knyazev, Zupančič, & Slobodskaya, 2008; Tackett, 2011; Tackett, Slobodskaya, et al., 2012). Thus, the ICID and HiPIC share a common origin, and both possess numerous psychometric advantages—although the pathways to measurement development have shown important differences as well. Yet, apart from these shared roots, an empirical understanding of how the ICID and HiPIC are related is currently unknown.

Links to Temperament and Psychopathology

Evidence of convergent and divergent validity is an essential component of construct validity (Chronbach & Meehl, 1955; Smith, 2005). To establish convergent and divergent validity for higher order child personality traits, we focus on two key areas: temperament and psychopathology. Connections with temperament traits and psychopathology domains serve the purpose of convergent/divergent validity tests for the core personality traits but serve a supplemental purpose of highlighting those areas in which the HiPIC and ICID are nonoverlapping. That is, unique associations between temperament/psychopathology constructs and HiPIC or ICID traits also provide important information regarding the psychological nature of nonoverlapping variance in each instrument. In other words, the extent to which one higher order trait domain (e.g., Extraversion) may predict externalizing problems via one child personality measure but not another suggests differential coverage of the externalizing domain in the two measures (e.g., perhaps the predictive measure offers greater coverage of content related to sensation-seeking behaviors, which in turn predict externalizing problems). Thus, through such analyses, we begin to "map" the overall personality content covered by each measure.

Research and theory on temperament traits represent a key context for any discussion of individual differences in

childhood (Rothbart, 2007; Rothbart, Ahadi, & Evans, 2000). Researchers in this area have historically focused on differentiating temperament from personality but in recent years have come to the general consensus that temperament and personality are more alike than different (e.g., De Pauw & Mervielde, 2010; Rothbart & Bates, 2006; Rothbart et al., 2000; Shiner & Caspi, 2003; Victor et al., 2013; Zentner & Bates, 2008). Nonetheless, the temperament tradition is nonoverlapping from research on child personality insofar as these research lines have developed independently of one another—this independence confers potential advantages on assessment endeavors. Temperament researchers often define temperament traits with a focus on reactivity and regulation (Zentner & Bates, 2008). The most prominent higher order model of temperament is arguably the model advanced by Rothbart (2007), which delineates three higher order temperament traits: negative affectivity, surgency-extraversion, and effortful control. The first two of these—negative affectivity and surgency-extraversion—show conceptual overlap with the personality traits of neuroticism and extraversion. Self-regulatory behaviors, which are indexed by both agreeableness and conscientiousness in personality models, are captured in the trait of effortful control from temperament perspectives (e.g., Kochanska, 1997; Rothbart et al., 2000; Tackett, Slobodskaya, et al., 2012).

Based on conceptual links, we would expect HiPIC and ICID traits reflecting neuroticism and extraversion to be closely linked to negative affectivity and surgency-extraversion as measured by a temperament approach. The potential for conceptual differences exist as well, however. Temperament approaches to negative affectivity often place more weight on frustration, anger, and antagonism than do personality approaches to neuroticism (perhaps in part due to the lack of a higher order agreeableness domain in temperament models; Rothbart, 2007; Shiner & Caspi, 2003; Tackett, Slobodskaya, et al., 2012; Zentner & Bates, 2008). Temperament approaches to surgency-extraversion capture the critical domain of *activity level*, which is not as integral to the personality trait of extraversion, particularly when it is derived from adult personality models (De Pauw, Mervielde, & Van Leeuwen, 2009; Shiner & Caspi, 2003; Zentner & Bates, 2008). Although some adult measures do include activity level as a facet of extraversion (e.g., the Revised NEO [Neuroticism-Extroversion-Openness] Personality Inventory; Costa & McCrae, 1992), many do not, and a major difference with younger populations is the high salience activity level demonstrates, both empirically and theoretically, in conceptualizations of youth extraversion (De Pauw et al., 2009; Soto & John, 2013; Tackett, Slobodskaya, et al., 2012). The final temperament domain, effortful control, has a fuzzier conceptual mapping onto models of personality traits. It perhaps reflects both agreeableness and conscientiousness but may reflect aspects of openness to experience (OE) as well, as trait OE hangs

much more tightly with conscientiousness in childhood (Herzhoff & Tackett, 2012; Tackett, Slobodskaya, et al., 2012). Rothbart (2007) positions effortful control as most closely linked to conscientiousness, so hypotheses regarding links to agreeableness and OE should be more tentative (De Pauw & Mervielde, 2010).

Temperament domains are significantly correlated with higher order ICID trait domains, although not as cleanly as one might hope (Deal et al., 2007; Halverson et al., 2003). Even the "big two" traits of neuroticism and extraversion as measured by the ICID, which conceptually show strong links with higher order temperament traits, appear to show variegated profiles when mapped on to lower order temperament facets (Deal et al., 2007; Halverson et al., 2003). A joint factor analysis using HiPIC facets and facets from several predominant temperament measures was conducted in a sample of 4- to 5-year-old children (De Pauw et al., 2009). This analysis also showed strong connections between temperament and HiPIC personality traits, but results did not present a direct mapping on to higher order domains and the authors concluded that temperament and child personality measures appear to capture unique (as well as overlapping) variance. Thus, the empirical relationships between temperament and child personality traits have not been comprehensively resolved.

Conceptual models and summaries of the literature have also established overarching connections between major domains of psychopathology (i.e., internalizing and externalizing problems) and both temperament and child personality traits (Nigg, 2006; Tackett, 2006). Specifically, internalizing problems such as depression and anxiety are primarily linked to high levels of neuroticism and low levels of extraversion (Clark & Watson, 1991; Durbin, Klein, Hayden, Buckley, & Moerk, 2005; Klein, Dyson, Kujawa, & Kotov, 2012; Kushner, Tackett, & Bagby, 2012). Externalizing problems such as oppositionality and conduct problems are primarily linked to high levels of neuroticism and low levels of both agreeableness and conscientiousness (Eisenberg, Spinrad, & Eggum, 2010; Tackett, Martel, & Kushner, 2012). These associations have generally held when personality is measured by the ICID (Deal et al., 2007; Halverson et al., 2003; Slobodskaya & Akhmetova, 2010; Tackett, Daoud, De Bolle, & Burt, 2013) and the HiPIC (De Fruyt et al., 2002; De Pauw et al., 2009). Thus, higher order traits as measured by the ICID and HiPIC were expected to show substantial convergence in their prediction of major psychopathology domains.

Although we review here a small body of literature examining associations between temperament, psychopathology, and either the HiPIC or ICID in isolation, the relevance of these analyses for the current study are nonredundant with this prior work. Specifically, no study to date has examined such associations simultaneously with the HiPIC and ICID in the same sample. In addition, such

analyses serve to highlight potential ways the HiPIC and ICID provide differential coverage of the higher order trait domains. That is, virtually identical associations for the two measures would suggest extremely high convergence in their measurement of higher order child personality trait domains. On the other hand, those instances where associations diverge offer potential insight into the psychological content of unique variance in either the HiPIC or ICID. For example, if the higher order extraversion trait as measured by the ICID predicted internalizing psychopathology, whereas HiPIC extraversion did not, this may suggest that ICID extraversion shows stronger coverage of positive affect/positive emotionality than does HiPIC extraversion. Thus, the analyses serve a unique purpose in the present study by extending our understanding of not only (a) how child personality traits are related to the highly relevant domains of temperament and psychopathology but also (2) the extent to which the HiPIC and ICID trait domains show strong convergence with one another and (c) the extent that they diverge, and these findings offer insight regarding differential psychological content captured by each measure.

The Present Study

Thus, despite their increasing popularity in child personality research, direct empirical associations between the HiPIC and ICID are not yet established. In addition, previous empirical research has laid a foundation for anticipated associations between child personality traits and temperament/psychopathology constructs, although such work remains sparse to date, particularly work using empirically derived measures of child personality. Importantly, such associations have not been used to examine overlapping and nonoverlapping variance *between* empirically derived child personality measures, which is a primary goal of the current study.

The current study had several sequential goals:

1. To conduct a validation study of the English-language translation of the HiPIC and demonstrate adequate to excellent psychometric properties.
2. To examine convergence across higher order trait structures as measured by the ICID and HiPIC; it was hypothesized that each higher order trait would be the best predictor of the analogous higher order trait from the alternate measure, in other words, that convergence would be high.
3. To examine associations between higher order traits from the ICID and HiPIC with higher order temperament traits and broadband dimensions of behavioral problems to better understand the extent to which higher order personality traits from each measure overlap and the extent to which they capture non-overlapping variance; these associations also served as tests of convergent and divergent validity.

Method

Participants

Participants were primary caregivers (579 mothers, 163 fathers, 61 other) of 803 youths aged 6 to 18 years (*M* = 11.34 years, *SD* = 3.63; 414 female). Participants were either solicited using a community-based participant pool database and posted flyers (*n* = 477) or recruited by undergraduate psychology students for course credit (*n* = 326) from an urban community in southern Ontario. Inclusion/exclusion criteria were fluency in English and absence of neurodevelopmental disorders, psychotic disorders, and mental retardation in the child. Informed consent was obtained from all participants. Caregivers reported the following ethnicity breakdown: 45.8% European, 17.2% Asian, 2.1% African, 1.2% Latin American, 10.7% Other, and 22.9% Unknown.

Measures

Hierarchical Personality Inventory for Children (Mervielde & De Fruyt, 1999). The HiPIC is a 144-item parent report questionnaire measuring child personality dimensions, which was originally developed with 5- to 13-year-old Belgian youth (Mervielde & De Fruyt, 1999). Items are rated 1 to 5, ranging from *barely characteristic* to *highly characteristic*. HiPIC items are scored to generate scales for 5 higher order personality dimensions and 18 lower order facets (listed above).

A preliminary English translation of the HiPIC was first produced by the primary authors of the instrument (IM and FD). An initial iterative process was established between these researchers (IM and FD) and the first author (JT) to refine English language items for grammar, clarity, and cross-cultural interpretability. Specifically, the native English-speaking researcher (JT) flagged items with potential interpretability issues and suggested alternatives, which were then vetted for clarity and content validity based on the facet to which the item was assigned, and items were subsequently revised in this iterative process by two coauthors (JT and IM) until both parties were satisfied with the technical and substantive nature of each item. Following this process, the English-language version of the HiPIC was fully back-translated by a bilingual (native language Dutch–speaking) researcher with an MA degree in child psychology and a P - hD in medical sciences, who had no previous familiarity with the HiPIC. This back-translation was closely reviewed and compared to the original Dutch-language HiPIC by the original HiPIC authors (IM and FD), with no major discrepancies identified between versions" (p. 4-5).

Inventory of Children's Individual Differences–Short Form (ICID-S; Deal et al., 2007). The ICID-S is a 50-item parent report

questionnaire measuring childhood personality dimensions. Items are rated 1 to 7, ranging from *much less than the average youth* to *much more than the average youth*. ICID-S items are scored to generate scales for higher order traits that are analogous, but not identical, to the FFM in adults (Costa & McCrae, 1992; Goldberg, 2001; Tackett, Slobodskaya et al., 2012) and for 15 lower order facet scales (listed above). Facet allocation to higher order traits corresponded to the structure outlined by Deal et al. (2007).

Revised Early Adolescent Temperament Questionnaire (EATQ-R; Ellis & Rothbart, 2001). The EATQ-R is a 62-item parent report questionnaire measuring early adolescent temperament dimensions. Items are rated 1 to 5, ranging from *almost always untrue of your child* to *almost always true of your child*. EATQ-R items are scored to generate scales for four higher order traits—Negative Affectivity, Surgency, and Effortful Control—and 10 lower order facet scales—Activation Control, Affiliation, Aggression, Attention, Depressive Mood, Fear, Frustration, High-Intensity Pleasure, Inhibitory Control, and Shyness.

Child Behavior Checklist (CBCL–6-18; Achenbach, 2001). The CBCL is a 113-item parent report questionnaire measuring youth psychopathology (6-18 years old). The presence of problems in the past 6 months are rated 0 to 2, ranging from *not true (as far as you know)* to *very true or often true*. Items from the CBCL are scored to generate dimensional scores for Internalizing Problems, Externalizing Problems, and Total Problems, as well as specific syndrome scales, which have demonstrated good psychometric properties (Achenbach & Rescorla, 2001). In the current investigation, we examined the CBCL Internalizing (CBCL INT) and Externalizing (CBCL EXT) Problems scales.

Procedure

Data were collected at the intake phase of a larger longitudinal study examining the role of personality in predicting behavioral outcomes. Ethics approval was obtained from the research ethics board. Packages including informed-consent documentation and questionnaires were mailed to participating caregivers to be completed and returned by mail. Participants recruited from the community received $10 CAD for completing the full protocol. Measures were completed as part of a planned missing-data design. As part of the planned missing-data design, nearly all participating caregivers completed the CBCL ($n = 796$; 99.1%), whereas 329 (41.0%) participants completed the HiPIC, 555 (69.1%) completed the ICID-S, and 386 (48.1%) completed the EATQ-R. Among participants recruited from the community, assignment to the HiPIC, ICID-S, and EATQ-R was determined by a coin toss. Among participants recruited by undergraduate psychology students, assignment to the

HiPIC and EATQ-R was determined by a coin toss, whereas the ICID-S was assigned to all in this subsample. Given that they were intentionally missing at random, missing data were imputed using the expectation-maximization algorithm in SPSS 20. For all missing value analyses, Little's Missing Completely at Random test was nonsignificant (all ps > .05).

Analyses

All descriptive, correlational, and regression analyses were conducted in SPSS 20. Coefficient alpha was computed to evaluate the internal consistency of all scales used in the present study. Independent-samples t tests were computed to compare all variables across gender, with Bonferroni corrections applied to adjust for Type I error within sets of common variables (e.g., $\alpha = .05/5$ for HiPIC traits, $\alpha = .05/5$ for ICID-S traits, $\alpha = .05/3$ for EATQ-R traits, and $\alpha = .05/2$ for CBCL problem scales). Correlation coefficients were computed to evaluate the general pattern of associations among variables. In addition, we conducted a series of multiple regression analyses. Specifically, convergence between the HiPIC and ICID-S was investigated by estimating a series of regression models wherein each higher order trait was predicted by block entry of the higher order traits from the other measure. The convergent and divergent validity of the HiPIC and ICID-S were further investigated in a series of subsequent multiple regression models wherein higher order EATQ-R traits and CBCL behavioral problems were predicted by block entry of the HiPIC or ICID-S higher order traits.

Results

Descriptive Statistics and HiPIC Structure

Descriptive statistics and internal consistency coefficients (coefficient alpha) for the present sample are listed in Table 1. On average, girls showed higher levels of HiPIC Benevolence ($M_{Girls} = 3.58$, $SD_{Girls} = 0.48$; $M_{Boys} = 3.48$, $SD_{Boys} = 0.50$; $t(801) = -2.91$, $p = .004$), HiPIC Conscientiousness ($M_{Girls} = 3.48$, $SD_{Girls} = 0.51$; $M_{Boys} = 3.33$, $SD_{Boys} = 0.50$; $t(801) = -4.34$, $p < .001$), ICID-S Conscientiousness ($M_{Girls} = 4.84$, $SD_{Girls} = 0.73$; $M_{Boys} = 4.69$, $SD_{Boys} = 0.71$; $t(801) = -2.82$, $p = .005$), and EATQ-R Effortful Control ($M_{Girls} = 3.39$, $SD_{Girls} = 0.59$; $M_{Boys} = 3.22$, $SD_{Boys} = 0.54$; $t(801) = -4.39$, $p < .001$), compared to boys. Regarding the English-language translation of the HiPIC, evidence for within-facet and within-domain structure was generally found. Specifically, internal consistency for the English language HiPIC scales was adequate to high ($\alpha = .72$-.92). Average correlations between HiPIC facets with other facets in the same domain were moderate, generally falling within recommended guidelines for domains where

Table 1. Descriptive Statistics and Internal Consistency Coefficients.

	M	*SD*	Range	Skewness	Kurtosis	α
HiPIC (N = 329)						
Neuroticism	2.46	0.64	1.19-4.25	0.47 (0.13)	−0.19 (0.27)	.88
Anxiety	2.46	0.81	1.00-4.88	0.43 (0.13)	−0.33 (0.27)	.85
Self confidence	3.54	0.62	1.63-4.88	−0.37 (0.13)	−0.01 (0.27)	.76
Extraversion	3.49	0.48	1.78-4.63	−0.29 (0.13)	0.11 (0.27)	.87
Shyness	2.31	0.65	1.00-4.63	0.55 (0.13)	−0.03 (0.27)	.79
Expressiveness	3.51	0.67	1.00-5.00	−0.36 (0.13)	0.18 (0.27)	.74
Optimism	3.63	0.57	1.88-4.88	−0.33 (0.13)	−0.06 (0.27)	.75
Energy	3.11	0.66	1.25-5.00	0.14 (0.13)	0.03 (0.27)	.72
Imagination	3.85	0.55	2.21-5.00	−0.50 (0.13)	0.14 (0.27)	.90
Creativity	3.90	0.70	1.50-5.00	−0.61 (0.13)	0.07 (0.27)	.83
Curiosity	3.63	0.68	1.75-5.00	−0.33 (0.13)	−0.31 (0.27)	.82
Intellect	4.01	0.67	2.00-5.00	−0.59 (0.13)	−0.18 (0.27)	.86
Benevolence	3.56	0.53	1.68-4.60	−0.64 (0.13)	0.34 (0.27)	.92
Egocentrism	2.44	0.62	1.25-4.50	0.64 (0.13)	0.30 (0.27)	.75
Irritability	2.47	0.88	1.00-4.63	0.41 (0.13)	−0.64 (0.27)	.89
Compliance	3.60	0.64	1.00-5.00	−0.58 (0.13)	0.57 (0.27)	.79
Dominance	2.75	0.62	1.38-4.75	0.34 (0.13)	0.03 (0.27)	.73
Altruism	3.83	0.74	1.13-5.00	−0.65 (0.13)	0.39 (0.27)	.91
Conscientiousness	3.42	0.59	1.56-4.72	−0.30 (0.13)	−0.14 (0.27)	.92
Achievement	3.53	0.70	1.63-5.00	−0.08 (0.13)	−0.44 (0.27)	.82
Orderliness	3.28	0.76	1.00-5.00	−0.28 (0.13)	−0.26 (0.27)	.82
Concentration	3.64	0.73	1.25-5.00	−0.52 (0.13)	−0.18 (0.27)	.82
Persistence	3.24	0.70	1.00-4.63	−0.42 (0.13)	−0.01 (0.27)	.81
ICID-S (N = 555)						
Neuroticism	3.32	0.93	1.00-6.50	−0.10 (0.10)	0.09 (0.21)	.85
Extraversion	5.06	0.84	2.07-7.00	−0.17 (0.10)	−0.20 (0.21)	.89
Openness	5.23	0.86	2.43-7.00	−0.01 (0.10)	−0.61 (0.21)	.85
Agreeableness	4.91	0.87	2.21-7.00	−0.10 (0.10)	−0.24 (0.21)	.93
Conscientiousness	4.77	0.85	1.94-7.00	−0.04 (0.10)	−0.16 (0.21)	.91
EATQ-R (N = 386)						
Negative Affect	2.48	0.55	1.22-4.39	0.28 (0.12)	−0.09 (0.25)	.86
Surgency	3.40	0.56	1.65-4.85	−0.15 (0.12)	−0.14 (0.25)	.83
Effortful Control	3.30	0.62	1.39-4.94	−0.18 (0.12)	−0.05 (0.25)	.89
CBCL (N = 796)						
Internalizing	5.64	5.93	0.00-42.00	1.88 (0.09)	4.71 (0.17)	.84
Externalizing	5.45	6.23	0.00-45.00	2.12 (0.09)	6.31 (0.17)	.96

Note. HiPIC = Hierarchical Personality Inventory for Children; ICID-S = Inventory of Children's Individual Differences–Short Form; EATQ-R = Revised Early Adolescent Temperament Questionnaire; CBCL = Child Behavior Checklist. Values are based on data prior to missing data imputation. Values in parentheses denote standard errors.

breadth is prioritized (Clark & Watson, 1995). It is widely accepted that the inherent complexity in comprehensive personality trait structure is not typically amenable to confirmatory structural analyses such as confirmatory factor analysis (Hopwood & Donnellan, 2010). Thus, such structural analyses were not a primary aim of the current study. However, to examine within-domain consistency for the English-language HiPIC, we fitted within-domain confirmatory factor analyses to item parcels, with correlated errors reflecting parcels within each facet, in order to confirm that within-domain structural models showed reasonably good fit (comparative fit index = 0.92-0.99).

Table 2 displays Pearson correlation coefficients among the HiPIC higher order traits with ICID-S, EATQ-R, and CBCL scales. Nearly all higher order HiPIC, ICID-S, EATQ-R, and CBCL problem scales were significant correlated ($p \leq .001$), with few exceptions (e.g., HiPIC Benevolence and EATQ-R Surgency). Correlation coefficients were largest among corresponding HiPIC and ICID-S higher order traits. Similarly, correlation coefficients were largest among corresponding HiPIC and EATQ-R higher order traits (i.e., HiPIC Extraversion with EATQ-R Surgency; HiPIC Conscientiousness with EATQ-R Effortful Control), with the exception of Negative

Table 2. Pearson Correlation Coefficients.

	HiPIC higher order traits				
	Neuroticism	Extraversion	Imagination	Benevolence	Conscientiousness
HiPIC Neuroticism	—				
HiPIC Extraversion	**−.41**	—			
HiPIC Imagination	**−.30**	**.58**	—		
HiPIC Benevolence	**−.34**	**.18**	**.22**	—	
HiPIC Conscientiousness	**−.37**	**.22**	**.50**	**.53**	—
ICID-S Neuroticism	**.76**	**−.34**	**−.38**	**−.57**	**−.54**
ICID-S Extraversion	**−.44**	**.78**	**.45**	**.35**	**.32**
ICID-S Openness	**−.15**	**.35**	**.73**	.09	**.38**
ICID-S Agreeableness	**−.33**	**.22**	**.32**	**.89**	**.56**
ICID-S Conscientiousness	**−.28**	**.15**	**.50**	**.48**	**.84**
EATQ-R Negative Affectivity	**.58**	**−.30**	**−.31**	**−.72**	**−.53**
EATQ-R Surgency	**−.52**	**.61**	**.49**	.05	**.26**
EATQ-R Effortful Control	**−.43**	**.19**	**.43**	**.46**	**.81**
CBCL Internalizing	**.56**	**−.36**	**−.17**	**−.26**	**−.22**
CBCL Externalizing	**.31**	−.07	**−.14**	**−.65**	**−.43**

Note. HiPIC = Hierarchical Personality Inventory for Children; ICID-S = Inventory of Children's Individual Differences–Short Form; EATQ-R = Revised Early Adolescent Temperament Questionnaire; CBCL = Child Behavior Checklist. Significant correlation coefficients ($p \leq .001$) are in boldface. $N = 803$.

Affect, which was more strongly associated with HiPIC Benevolence.

Convergence Between HiPIC and ICID-S Higher Order Traits

A series of regressions were conducted to evaluate the relationships between the higher order traits of the HiPIC and ICID-S.[1] Regression analyses were conducted separately for each higher order HiPIC trait, entered as the dependent variable (i.e., 1: Neuroticism, 2: Extraversion, 3: Imagination, 4: Benevolence, 5: Conscientiousness; see Table 3), simultaneously predicted by all higher order traits from the ICID-S. The results of these analyses suggested that each higher order HiPIC trait was most strongly predicted by the corresponding higher order ICID-S trait. Specifically, HiPIC Neuroticism was most strongly predicted by ICID-S Neuroticism, HiPIC Extraversion by ICID-S Extraversion, HiPIC Imagination by ICID-S Openness, HiPIC Benevolence by ICID-S Agreeableness, and HiPIC Conscientiousness by ICID-S Conscientiousness.

A second series of regressions were conducted, this time predicting ICID-S higher order traits from HiPIC higher order traits. Regression analyses were conducted separately for each higher order ICID-S trait, entered as the dependent variable (i.e., 1: Neuroticism, 2: Extraversion, 3: Openness, 4: Agreeableness, 5: Conscientiousness; see Table 4), simultaneously predicted by all five higher order HiPIC traits. The results of these analyses suggested that each higher order ICID-S trait was most strongly predicted by the corresponding higher order HiPIC trait. Specifically, ICID-S Neuroticism was most strongly predicted by HiPIC

Neuroticism, ICID-S Extraversion by HiPIC Extraversion, ICID-S Openness by HiPIC Imagination, ICID-S Agreeableness by HiPIC Benevolence, and ICID-S Conscientiousness by HiPIC Conscientiousness.

Convergent and Divergent Validity

A series of regressions were conducted to evaluate the relationships between the higher order traits of the HiPIC and ICID-S and the EATQ-R temperament traits. Regression analyses were conducted separately for each higher order EATQ-R trait, entered as the dependent variable (i.e., 1: Negative Affectivity, 2: Surgency, 3: Effortful Control; see Table 5), simultaneously predicted by either the five ICID-S or the five HiPIC traits. EATQ-R Negative Affectivity was significantly predicted by HiPIC scales measuring Benevolence, Neuroticism, and Conscientiousness and ICID-S scales measuring Neuroticism, Agreeableness, and Openness. Surgency was significantly predicted by HiPIC scales measuring Extraversion, Neuroticism, Benevolence, Imagination, and Conscientiousness and ICID-S scales measuring Extraversion, Agreeableness, Neuroticism, and Openness. Effortful Control was significantly predicted by HiPIC scales measuring Conscientiousness, Neuroticism, and Extraversion and ICID-S scales measuring Conscientiousness, Neuroticism, Openness, and Agreeableness.

Regression analyses were also conducted to evaluate the relationships between the higher order traits of the HiPIC and ICID-S and CBCL INT and EXT. Regression analyses were conducted separately for CBCL INT and CBCL EXT, entered as dependent variables, with either all five HiPIC or all five ICID-S traits entered simultaneously as predictors

Table 3. Hierarchical Regression Analyses Predicting Higher Order HiPIC Dimensions From Higher Order ICID-S Dimensions.

Variable	B	SE B	β	95% CI	R^2	F
HiPIC Neuroticism					.66	308.00***
ICID-S Neuroticism	0.66	0.02	.99***	[0.62, 0.70]		
ICID-S Extraversion	—0.11	0.02	−0.14***	[−0.15, −0.07]		
ICID-S Openness	0.06	0.02	.07**	[0.01, 0.10]		
ICID-S Agreeableness	0.24	0.02	.33***	[0.19, 0.28]		
ICID-S Conscientiousness	0.07	0.02	.09**	[0.02, 0.12]		
HiPIC Extraversion					.64	283.93***
ICID-S Neuroticism	—0.03	0.02	−.06	[−0.06, 0.00]		
ICID-S Extraversion	0.46	0.02	.82***	[0.43, 0.49]		
ICID-S Openness	0.03	0.02	.06*	[0.00, 0.06]		
ICID-S Agreeableness	—0.08	0.02	−0.15***	[−0.11, −0.05]		
ICID-S Conscientiousness	—0.05	0.02	−.09*	[−0.09, −0.01]		
HiPIC Imagination					.57	213.40***
ICID-S Neuroticism	—0.05	0.02	−.08*	[−0.08, −0.01]		
ICID-S Extraversion	0.07	0.02	.11**	[0.03, 0.10]		
ICID-S Openness	0.39	0.02	.63***	[0.35, 0.43]		
ICID-S Agreeableness	0.02	0.02	.03	[−0.02, 0.06]		
ICID-S Conscientiousness	0.03	0.02	.04	[−0.02, 0.07]		
HiPIC Benevolence					.82	711.58***
ICID-S Neuroticism	0.03	0.01	.05*	[0.00, 0.06]		
ICID-S Extraversion	0.00	0.01	.01	[−0.02, 0.03]		
ICID-S Openness	—0.10	0.01	−0.14***	[−0.12, −0.07]		
ICID-S Agreeableness	0.62	0.02	.96***	[0.59, 0.65]		
ICID-S Conscientiousness	0.00	0.02	.00	[−0.03, 0.03]		
HiPIC Conscientiousness					.73	435.46***
ICID-S Neuroticism	—0.02	0.02	−.03	[−0.05, 0.02]		
ICID-S Extraversion	0.08	0.02	.11***	[0.04, 0.11]		
ICID-S Openness	—0.13	0.02	−0.18***	[−0.17, −0.10]		
ICID-S Agreeableness	—0.01	0.02	−.02	[−0.05, 0.03]		
ICID-S Conscientiousness	0.64	0.02	.90***	[0.60, 0.68]		

Note. HiPIC = Hierarchical Personality Inventory for Children; ICID-S = Inventory of Children's Individual Differences–Short Form; CI = confidence interval. *N* = 803.
*$p < .05$. **$p < .01$. ***$p < .001$.

(see Table 6). CBCL INT was significantly predicted by HiPIC scales measuring Neuroticism, Extraversion, Imagination, and Benevolence and ICID-S scales measuring Neuroticism, Extraversion, Agreeableness, Openness, and Conscientiousness. CBCL EXT was significantly predicted by HiPIC scales measuring Benevolence, Conscientiousness, Neuroticism, and Extraversion and ICID-S scales measuring Agreeableness, Neuroticism, Openness, Extraversion, and Conscientiousness.

Discussion

Taken together, these findings largely support evidence for construct validity for higher order child personality traits across empirically developed measures of child personality. Specifically, the present study had three primary goals. First, we attempted the initial validation of an English-language measure of the HiPIC. These findings are consistent with the original Dutch version of the HiPIC in demonstrating strong psychometric properties in this sample. The second primary goal of the study was to examine convergence between the higher order domains assessed by the HiPIC and ICID-S, particularly between analogous traits in each measure. As hypothesized, the higher order trait from each measure was the strongest unique predictor of the analogous trait in the other measure (e.g., ICID-S Neuroticism was the best unique predictor of HiPIC Neuroticism). These results were consistent across correlation and regression coefficients. In addition, a number of traits showed additional significant unique prediction from nonanalogous higher order traits, which itself is not surprising (e.g., Biesanz & West, 2004) but was further informative in the lack of symmetry between measures. For example, HiPIC Extraversion was positively predicted by

Table 4. Hierarchical Regression Analysis Predicting Higher Order ICID-S Dimensions From Higher Order HiPIC Dimensions.

Variable	B	SE B	β	95% CI	R^2	F
ICID-S Neuroticism					.71	380.94***
HiPIC Neuroticism	0.90	0.03	.60***	[0.83, 0.96]		
HiPIC Extraversion	0.06	0.05	.03	[−0.04, 0.16]		
HiPIC Imagination	−0.15	0.05	−.08**	[−0.24, −0.05]		
HiPIC Benevolence	−0.46	0.04	−.28***	[−0.54, −0.39]		
HiPIC Conscientiousness	−0.22	0.04	−.14***	[−0.30, −0.14]		
ICID-S Extraversion					.67	323.05***
HiPIC Neuroticism	−0.08	0.03	−.06**	[−0.15, −0.02]		
HiPIC Extraversion	1.36	0.05	.76***	[1.27, 1.46]		
HiPIC Imagination	−0.14	0.05	−.09**	[−0.23, −0.05]		
HiPIC Benevolence	0.25	0.04	.17***	[0.18, 0.32]		
HiPIC Conscientiousness	0.11	0.04	.08**	[0.04, 0.19]		
ICID-S Openness					.55	198.28***
HiPIC Neuroticism	0.05	0.04	.04	[−0.02, 0.13]		
HiPIC Extraversion	−0.16	0.06	−.09**	[−0.27, −0.05]		
HiPIC Imagination	1.27	0.05	.78***	[1.16, 1.37]		
HiPIC Benevolence	−0.13	0.04	−.09**	[−0.21, −0.05]		
HiPIC Conscientiousness	0.09	0.05	.07*	[0.00, 0.18]		
ICID-S Agreeableness					.82	702.77***
HiPIC Neuroticism	0.01	0.03	.00	[−0.04, 0.06]		
HiPIC Extraversion	−0.01	0.04	−.01	[−0.08, 0.07]		
HiPIC Imagination	0.19	0.04	.11***	[0.12, 0.26]		
HiPIC Benevolence	1.30	0.03	.84***	[1.25, 1.36]		
HiPIC Conscientiousness	0.09	0.03	.06**	[0.03, 0.16]		
ICID-S Conscientiousness					.73	435.02***
HiPIC Neuroticism	0.03	0.03	.02	[−0.03, 0.09]		
HiPIC Extraversion	−0.25	0.04	−.14***	[−0.34, −0.16]		
HiPIC Imagination	0.32	0.04	.20***	[0.24, 0.40]		
HiPIC Benevolence	0.12	0.03	.08***	[0.05, 0.18]		
HiPIC Conscientiousness	1.05	0.04	.74***	[0.98, 1.12]		

Note. HiPIC = Hierarchical Personality Inventory for Children; ICID-S = Inventory of Children's Individual Differences–Short Form; CI = confidence interval. *N* = 803.
*p < .05. **p < .01. ***p < .001.

ICID-S Openness, whereas ICID-S Extraversion was negatively predicted by HiPIC Imagination.

We conducted post hoc analyses to more deeply explore this more surprising finding: the unique negative prediction of ICID-S Extraversion by HiPIC Openness. This small but significant finding largely reflects the partialing out of other higher order trait domains. That is, the post hoc analyses revealed that when the other HiPIC higher order traits are controlled for, none of the HiPIC Imagination facets significantly predict ICID-S Extraversion (all *p*s > .095), but without controlling for this covariation, each of the HiPIC Imagination facets accounts for unique variance in ICID-S Extraversion (all *p*s ≤ .001) in the expected direction (i.e., Imagination facets positively predicting ICID-S Extraversion). Thus, such findings highlight the relevance of both correlational results (which capture the full breadth of trait variance) and regression analyses (which capture

trait-specific variance) as employed in the present study. In addition, this finding reflects asymmetry in content coverage between measures, such that unique variance in ICID-S Openness positively predicted HiPIC Extraversion. The current investigation represents the first attempt to examine the empirical associations between the HiPIC and ICID-S within the same sample. As such, the current findings offer greater psychological understanding of the differential content assessed by each measure, and should facilitate interpretation of future results and comparability across studies using these measures.

The third primary goal of the study was to examine evidence for convergent and divergent validity between the HiPIC and ICID-S higher order domains and primary constructs from temperament and psychopathology. This provides information regarding the extent to which the higher order personality traits from the HiPIC and ICID-S overlap

Table 5. Hierarchical Regression Analyses Predicting Higher Order EATQ-R Dimensions From Higher Order HiPIC Dimensions and Higher Order ICID-S Dimensions.

Variable	B	SE B	β	95% CI	R^2	F
EATQ-R Negative Affectivity						
HiPIC Dimensions					.65	297.58***
HiPIC Neuroticism	0.33	0.02	.35***	[0.28, 0.38]		
HiPIC Extraversion	−0.04	0.04	−.03	[−0.11, 0.03]		
HiPIC Imagination	−0.03	0.03	−.02	[−0.09, 0.04]		
HiPIC Benevolence	−0.56	0.03	−.54***	[−0.62, −0.51]		
HiPIC Conscientiousness	−0.10	0.03	−.10**	[−0.16, −0.04]		
ICID-S Dimensions					.66	302.15***
ICID-S Neuroticism	0.31	0.02	.49***	[0.28, 0.35]		
ICID-S Extraversion	−0.04	0.02	−.05	[−0.08, 0.00]		
ICID-S Openness	0.08	0.02	.11***	[0.04, 0.12]		
ICID-S Agreeableness	−0.25	0.02	−.37***	[−0.29, −0.21]		
ICID-S Conscientiousness	−0.02	0.02	−.03	[−0.07, 0.03]		
EATQ-R Surgency						
HiPIC Dimensions					.51	167.95***
HiPIC Neuroticism	−0.33	0.03	−.35***	[−0.38, −0.28]		
HiPIC Extraversion	0.51	0.04	.40***	[0.43, 0.60]		
HiPIC Imagination	0.18	0.04	.16***	[0.10, 0.26]		
HiPIC Benevolence	−0.23	0.03	−.22***	[−0.29, −0.17]		
HiPIC Conscientiousness	0.08	0.03	.08*	[0.01, 0.15]		
ICID-S Dimensions					.53	182.04***
ICID-S Neuroticism	−0.30	0.02	−.47***	[−0.34, −0.25]		
ICID-S Extraversion	0.35	0.02	.49***	[0.30, 0.39]		
ICID-S Openness	0.15	0.02	.21***	[0.11, 0.20]		
ICID-S Agreeableness	−0.32	0.03	−.48***	[−0.37, −0.28]		
ICID-S Conscientiousness	0.02	0.03	.03	[−0.07, 0.03]		
EATQ-R Effortful Control						
HiPIC Dimensions					.68	333.93***
HiPIC Neuroticism	−0.17	0.03	−.16***	[−0.22, −0.13]		
HiPIC Extraversion	−0.11	0.04	−.08**	[−0.18, −0.03]		
HiPIC Imagination	0.07	0.04	.05	[−0.01, 0.14]		
HiPIC Benevolence	0.03	0.03	.02	[−0.03, 0.08]		
HiPIC Conscientiousness	0.82	0.03	.73***	[0.76, 0.88]		
ICID-S Dimensions					.61	246.37***
ICID-S Neuroticism	−0.17	0.02	−.24***	[−0.22, −0.12]		
ICID-S Extraversion	0.03	0.02	.04	[−0.01, 0.08]		
ICID-S Openness	−0.14	0.02	−.17***	[−0.18, −0.09]		
ICID-S Agreeableness	−0.08	0.03	−.10**	[−0.13, −0.03]		
ICID-S Conscientiousness	0.60	0.03	.75***	[0.54, 0.65]		

Note. EATQ-R = Early Adolescence Temperament Questionnaire-Revised; HiPIC = Hierarchical Personality Inventory for Children; ICID-S = Inventory of Children's Individual Differences–Short Form. *N* = 803.
*p < .05. **p < .01. ***p < .001.

and the extent to which they capture nonoverlapping variance. Specific hypotheses were developed from the literature, but these analyses were also intended to further clarify the psychological nature of nonoverlapping variance in the HiPIC and ICID-S. Regarding links with higher order temperament traits, the hypotheses were only partially supported and overall findings were complex. Similar to previous work (De Pauw et al., 2009; Halverson et al.,

2003), overall mapping was somewhat messy with multiple associations demonstrated between higher order personality and temperament traits. These findings support the interpretation by De Pauw et al. (2009) that temperament and personality measures contain both overlapping and nonoverlapping variance. Regarding content-specific hypotheses, findings were partially supported for Neuroticism-Negative Affectivity (ICID-S Neuroticism was the best predictor of EATQ-R

Table 6. Hierarchical Regression Analyses Predicting CBCL Internalizing and Externalizing Problems From Higher Order HiPIC Dimensions and Higher Order ICID-S Dimensions.

Variable	B	SE B	β	95% CI	R^2	F
CBCL Internalizing Problems						
HiPIC Dimensions					.35	84.27***
HiPIC Neuroticism	5.11	0.37	.47***	[4.39, 5.84]		
HiPIC Extraversion	−3.38	0.56	−.23***	[−4.48, −2.28]		
HiPIC Imagination	1.72	0.54	.13**	[0.66, 2.77]		
HiPIC Benevolence	−1.02	0.42	−.08*	[−1.84, −0.20]		
HiPIC Conscientiousness	−0.20	0.46	−.02	[−1.10, 0.70]		
ICID-S Dimensions					.32	75.38***
ICID-S Neuroticism	4.05	0.32	.55***	[3.41, 4.68]		
ICID-S Extraversion	−2.36	0.31	−.29***	[−2.97, −1.74]		
ICID-S Openness	0.93	0.32	.11**	[0.29, 1.57]		
ICID-S Agreeableness	1.34	0.35	.17***	[0.66, 2.02]		
ICID-S Conscientiousness	0.82	0.38	.10*	[0.08, 1.56]		
CBCL Externalizing Problems						
HiPIC Dimensions					.44	125.54***
HiPIC Neuroticism	1.26	0.36	.11***	[0.56, 1.97]		
HiPIC Extraversion	1.18	0.54	.08*	[0.11, 2.24]		
HiPIC Imagination	0.57	0.52	.04	[−0.45, 1.60]		
HiPIC Benevolence	−7.12	0.41	−.56***	[−7.91, −6.32]		
HiPIC Conscientiousness	−1.59	0.44	−.13***	[−2.46, −0.72]		
ICID-S Dimensions					.45	131.23***
ICID-S Neuroticism	1.18	0.31	.15***	[0.58, 1.78]		
ICID-S Extraversion	1.15	0.30	.13***	[0.57, 1.73]		
ICID-S Openness	1.21	0.31	.14***	[0.60, 1.81]		
ICID-S Agreeableness	−4.60	0.33	−.56***	[−5.24, −3.96]		
ICID-S Conscientiousness	−0.91	0.36	−.11*	[−1.60, −0.21]		

Note. CBCL = Child Behavior Checklist; HiPIC = Hierarchical Personality Inventory for Children; ICID-S = Inventory of Children's Individual Differences–Short Form. N = 803.
*p < .05. **p < .01. ***p < .001.

Negative Affectivity, but HiPIC Neuroticism was not), partially supported for Extraversion-Surgency (Extraversion and Neuroticism from both personality measures showed equivalent prediction of EATQ-R Surgency, and for the ICID-S predictors, Agreeableness did, as well), and fully supported for Conscientiousness-Effortful Control (with only small unique predictions from other personality traits). However, the pattern of findings for HiPIC and ICID-S predictors were largely similar to one another. In the context of the previous findings regarding ICID-S/HiPIC convergence, these analyses further suggest that the ICID-S and HiPIC show greater convergence with one another than they do with major models of temperament.

The final set of analyses examined connections between HiPIC/ICID-S traits and higher order dimensions of youth psychopathology (i.e., internalizing and externalizing problems). These findings largely supported content-specific hypotheses drawn from the broader literature (Nigg, 2006; Tackett, 2006). Specifically, internalizing problems were best predicted by Neuroticism in both HiPIC and ICID-S measures with additional prediction from low Extraversion

in both measures. An important point of divergence is regarding the Agreeableness trait, such that HiPIC Benevolence negatively predicted internalizing problems, whereas ICID-S Agreeableness strongly and positively predicted internalizing problems (see also Kushner et al., 2012, for similar findings in another sample). Thus, the way Agreeableness content is assessed in the HiPIC and ICID-S appears to be particularly divergent in the context of youth internalizing problems. Post hoc analyses suggested that there are some similarities revealed at the facet level not seen at the higher order trait level. Specifically, HiPIC Dominance negatively predicted internalizing problems (β = −.30, p < .001), which is consistent with findings from the ICID-S Agreeableness domain. However, additional unique predictors from the HiPIC included high Egocentrism (β = .35, p < .001) and Irritability (β = .33, p < .001), likely resulting in the overall discrepant associations seen at the higher order trait level. Thus, additional content at the lower order trait level (e.g., egocentric traits) from the HiPIC may be relevant for the prediction of internalizing problems that is not assessed by the ICID-S. Externalizing problems were

best predicted by low Agreeableness/Benevolence from both the HiPIC and the ICID-S. Smaller, but significant contributions were found for Neuroticism and low Conscientiousness but were much more modest in size. Divergent findings using two independently developed measures of child personality provide novel insights into areas of personality variance that may not be captured by either one measure alone, and may therefore be relevant for the continued refinement of child personality models. Overall, these findings also demonstrate many more similarities in HiPIC/ICID-S content than differences, suggesting that both measures capture important variance in childhood personality traits.

Limitations and Future Directions

One important future direction for research draws from robust empirical evidence that the structure of personality is hierarchical across the life span (Markon, Krueger, & Watson, 2005; Tackett et al., 2013). There remains a need to better understand differential functions of hierarchy levels and better integration with work using two-factor dispositional frameworks (Slobodskaya & Kuznetsova, 2013). The personality hierarchy has been particularly useful in the adult literature in reconciling disparate findings across various factorial models (e.g., two-, three-, four-, and five-factor models; Markon et al., 2005). There was similar hope that such hierarchical models would facilitate links between three-factor temperament models and five-factor child personality models (Tackett et al., 2013), although the work presented here (along with that of others, De Pauw et al., 2009) suggests that such links may be more complex than a simple hierarchical mapping allows. Thus, it is imperative that researchers resist simplistic interpretations of temperament–personality connections and, instead, look more deeply into such similarities and differences. It is likely that each field stands much to gain from the other if a thoughtful approach is taken to merging measures and research across these disciplines (De Pauw et al., 2009; Herzhoff & Tackett, 2012; Victor et al., 2013). A related point is the need for future studies to jointly investigate the interrelations and structure of temperament and personality measures, which has not been extensively examined in the literature to date (but see De Pauw et al., 2009).

There are a number of measurement limitations to conducting this type of research, and the present study is no exception. Limitations of caregiver reports for child temperament/personality have been discussed extensively (e.g., Rothbart & Bates, 2006; Tackett, 2011). Caregivers do possess numerous advantages as "judges" as well, including their extensive knowledge and information about their child's personality as well as motivation to present the child accurately (Tackett, 2011). Nonetheless,

it is essential that future researchers strive to incorporate other informants as well as other methodological sources (e.g., observational approaches) in child personality research. Another important limitation in the present study is use of the EATQ-R for the entire age range of the sample. The EATQ-R was specifically validated for children ages 10 to 16 and was selected for the present study because it captured the largest age range in this sample relative to other measures in the Rothbart family of instruments (all of which are age specific). It is clearly important to understand how such results might change if age-specific temperament measures are used (e.g., the Children's Behavior Questionnaire for the 6- to 7-year-olds; Rothbart, Ahadi, Hershey, & Fisher, 2001). However, it is also important for researchers not to be strictly limited by the age specificity of these measures when conducting research with large age ranges, as this likely limits important cross-disciplinary work (e.g., longitudinal studies examining the development of temperament traits across childhood and adolescence into adult personality).

Final Conclusions

This research presents the first empirical investigation of convergence and divergence between two empirically derived and psychometrically sound measures of child personality, the HiPIC (Mervielde & De Fruyt, 1999) and the ICID-S (Deal et al., 2007; Halverson et al., 2003). Specifically, the HiPIC and ICID-S show strong convergence across higher order trait domains that are analogous, but not identical, to the traditional FFM observed in adults (Digman, 1989; Goldberg, 2001; Halverson et al., 2003; Mervielde & De Fruyt, 1999). Connections between child personality and temperament traits appear somewhat complex, although similar prediction was evidenced for HiPIC and ICID-S trait domains, suggesting that these child personality measures are more similar to each other than they are to prominent temperament measures. Hypotheses were generally supported regarding personality trait connections with internalizing and externalizing problems and showed further convergence across trait measurement by the HiPIC and ICID-S. Deviations in HiPIC/ICID-S predictions of temperament and psychopathology lend further information for researchers aiming to reconcile findings across studies. In addition, this article presents the first validation data for an English translation of the HiPIC, which continues to show strong psychometric properties in the English-language version. In sum, the current study presents a multifaceted contribution to the existing evidence base for the construct validity of child personality traits and underscores the need for continued research on child personality traits as a distinct area of study.

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Declaration of Conflicting Interests

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Note

1. All analyses were also conducted including child gender and age as covariates. The results of these analyses were consistent with the results detailed in this article and are available on request.

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