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A Study of Personality in Children Aged 8 to 12 Years: Comparing self and parents' ratings

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Abstract

This cross-sectional study was designed to investigate personality in children aged 8 to 12 years. Children's self-perceptions were compared to parent's ratings. Parents of 506 children completed the Hierarchical Personality Inventory for Children (HiPIC) and children completed a selection of 38 questions from the HiPIC. Results showed that children aged 11-12 years present higher structural congruence, higher reliabilities and higher mean correlation with parents' description than children aged 8-9 years. Interestingly reliabilities of parents' ratings were also higher for older children. Mean-levels were higher in younger children for Imagination in parents' ratings and for Benevolence, Conscientiousness and Imagination, in children's ratings.

Key words: Personality, Five-Factor Model, Children, HiPIC.

A Study of Personality in Children Aged 8 to 12 Years: Comparing self and parents' ratings

The Five-Factor Model (FFM) is currently the most common dimensional approach to personality traits. The model postulates that personality traits are expressions of heritability and intrinsic maturation (McCrae et al., 2000) whereas characteristic adaptations (which include the self-concept) respond to the opportunities and incentives of the social environment. The interpretation of traits as endogenous basic tendencies is consistent with their cross-cultural universality (McCrae & Terracciano, 2005; McCrae & Costa, 2006; Rossier, 2005; Rossier, Dahourou, & McCrae, 2005) and with their heritability (Krueger, Johnson, & Kling, 2006; Yamagata et al., 2006). According to this model, five broad and independent domains are sufficient to describe personality traits. These domains are Neuroticism, Extraversion, Openness to experience, Agreeableness, and Conscientiousness (McCrae & Costa, 1999). The validity of this model has been assessed mainly with adults but also with adolescents (Allik, Laidra, Realo, & Pullmann, 2004; Asendorpf & van Aken, 2003; Baker, Victor, Chambers, & Halverson, 2004; John, Caspi, Robins, Moffitt, & Stouthamer-Loeber, 1994; Lamb, Chuang, Wessels, Broberg, & Hwang, 2002; Pullmann, Raudsepp, & Allik, 2006; McCrae et al., 2002; Shiner & Caspi, 2003). Overall, these studies showed that children aged 12 years old have already developed abilities required for observing one's own personality dispositions and for giving reliable self-reports on the basis of these observations. Concerning children aged 8 to 12, many uncertainties remain and only few studies explored self-ratings reliabilities (Barbaranelli, Caprara, Rabasca, & Pastorelli, 2003; De Fruyt et al., 2006; Measelle, John, Ablow, Cowan, & Cowan, 2005). The present cross-sectional study was therefore designed to investigate personality in 8 to 12 years old children and to more precisely focus on the capacity of the child to express reliable self-concept about his or her personality.

Several instruments have been developed for adults and adolescents (Rossier, Meyer de Stadelhofen, & Berthoud, 2004), such as the NEO-PI-R (Costa & McCrae, 1992), to measure personality traits. However, there are few inventories that are specifically devoted to assess children's personality. Shiner and Caspi (2003) made a review of several recent measures that included the Inventory of Child Individual Differences (Halverson et al., 2003), the Big Five Adjective Checklists (Goldberg, 2001), the California Child Q-Set (Caspi et al., 1992) and the Hierarchical Personality Inventory for Children (Mervielde & De Fruyt, 1999, 2002; Rossier, Quartier, Enescu, & Iselin, 2007). Several reasons may explain the recent development of such instruments. First, the temperament concept, defined as constitutionally based on individual differences in reactivity and self-regulation, in the domains of affect, activity and attention (Rothbart & Bates, 2006), was usually preferred to the concept of personality traits with infants and children. Though it is now well known that temperament is linked to the Five Factor Model (Rothbart & Ahadi, 1994; Shiner & Caspi, 2003; Shiner, 2006; Caspi & Shiner, 2006).

The second reason refers to the cognitive skills that require the self-report questionnaires typically used to assess the traits. According to De Fruyt and Völlrath (2003), children need to have acquired sufficient language and cognitive skills, including strategies to compare their own behavior with that of their peers, in order to give reliable and valid ratings of their own personality. For this reason, studies on childhood personality often rely on adult ratings, rather than using the children's self-description. However, it is unknown at what age a child is capable of answering personality's questionnaires. Self-report abilities is linked to the development of James's Me-self concept (1890, 1892), in other words the child's developmental capacity to describe him/herself as an object. Harter (2006) recently summarized the developmental differences in self-representations during childhood and adolescence. Between the ages of 3 to 4 most children can only construct concrete cognitive representations of observable or behavioral features of the self (e.g., "I can count") and of preferences (e.g., "I like pizza"). From the age of 5, children begin to display a

rudimentary ability to inter-coordinate concepts that were previously compartmentalized (e.g., "I'm good at schoolwork"). Eder and Mangelsdorf (1997) reported that in middle childhood (approximately age 6 to 12), children start to describe themselves and others with trait terms. Furthermore, Harter (2006) observed that they now could express emotions of opposing valences (e.g., "I was happy that I got a present but mad that it wasn't what I wanted"). Around the age of 10 or 11, children first combine and integrate trait labels and show an increased ability to express more differentiated descriptions of their behavior. In early adolescence, trait labels integrate into higher-order self-concepts (e.g., "I am extraverted"). Barenboim (1981) proposed a three-stage model for the development of person perception (behavioral comparisons, psychological constructs, and psychological comparisons). According to this model, the use of trait-like constructs to describe peers begins at 8 years and comparisons in trait-terms starts around the age of 12.

Third, as well as cognitive development, the child's social environment undoubtedly influences the development of his/her own personality description (Higgins, 1987; Sullivan, 1953). For example Anderson and Chen (2002), in their Relational Self theory, made the assumption that the knowledge about the self is linked with the multiple relationships to significant others by a phenomenon of transference. Varying responses across situations are what progressively constitute the individual's personality.

Finally, the developmental capacity to recognize and express feelings and emotions grows up simultaneously with the natural maturation of personality traits. In a meta-analysis, Roberts and Del Vecchio (2000) showed that trait consistency based on test-retest correlation coefficients increased from .31 in childhood to .54 during the college years, to .64 at age 30 and then reached .74 between ages 50 and 70. In addition of the increased consistencies, personality traits also showed meaningful and statistically significant mean-level change. Indeed, mean level changes occurred across the whole life course (Roberts, Walton, & Viechtbauer, 2006). Terracciano, McCrae, Brant and Costa (2005) observed gradual personality changes in adulthood, more precisely a decline in Neuroticism

and in Openness, stability and then decline of Extraversion and finally increase in Agreeableness and in Conscientiousness. However, most cross-sectional and longitudinal studies have concluded that the majority of personality changes occur before the age of 30 (Costa & McCrae, 2002).

Several studies investigated personality mean-level changes in childhood and adolescents. In a longitudinal study, Measelle, John, Ablow, Cowan and Cowan (2005) used a puppet interview to assess personality in young children and reported increases in Conscientiousness between ages 5 to 7. Lamb et al. (2002) conducted a longitudinal study of 102 children assessed by adults (mothers and teachers) and followed them from 2 to 15 years. They observed an increase in agreeableness and conscientiousness and a decline in extraversion between 2 and 15. Neuroticism increased slightly until 8 and remained stable thereafter. Openness increased between 2 and 4, remained stable between 4 and 8, and decreased thereafter. In a previous cross-sectional study, Rossier and colleagues (2007) observed higher internal consistencies at 11-12 years than at 8-9 years and modest mean-level differences between the age groups. The results showed a small cross-sectional decline in Extraversion and Imagination for both girls and boys, and also a decline in Emotional Stability for girls. Allik and colleagues (2004) recently conducted a cross-sectional study with children between 12 and 18 year old. They showed that the level of Openness was higher in older children and the levels Agreeableness and Conscientiousness was higher in younger children, whereas mean levels for Neuroticism and Extraversion did not differ between the age groups. They also observed a higher internal consistency at 18 than at 12 year old. A part of the same sample was included in a longitudinal study (Pullmann, Raudsepp, & Allik, 2006). Results confirmed the increase of the mean level of openness, but not the decrease of Neuroticism and Extraversion and showed an increasing tendency to become more emotionally stable. Moreover, adolescents from the age of 14 years became more tolerant and open to new ideas and experiences. In a longitudinal, cross-sectional and cross-cultural study, McCrae and colleagues (2002) found that adolescents between age 12 and 18 increased in Openness to experience and that girls also increased in

Neuroticism. Mean levels of Extraversion, Agreeableness and Conscientiousness however were stable during adolescence.

Despite the necessary use of these parents' and teachers' reports when assessing personality, affectivity or mood states, it is important to also obtain data directly from children because adult reports have shown relatively weak convergence, essentially due to the poor inter-judge agreement among informants (Hinshaw, Han, Erhardt, & Huber, 1992; Kroes, Veerman, & De Bruyn, 2003; Mick, Santangelo, Wypij, & Biederman, 2000; Najman, et al., 2000; Sawyer, Strainer, & Baghurst, 1998). However, only few studies (De Fruyt et al., 2006) explored the validity and the reliability of a self-report questionnaire measuring personality in children aged 8 to 12 years old. Therefore, this cross-sectional study aims to test the consistencies of child self-reports on her/his personality and to compare self- with parents' ratings. Consistent with the current scientific literature, this study addresses three hypotheses. First, it is expected that the internal consistency of children's self-perception would be higher at 11-12 than at 8-9 year old (Allik et al., 2004; Roberts & Del Vecchio, 2000). Secondly, it is expected that the agreement between the parents' perception and the children's self-perception would likewise enhance with the age of the children. Finally, it is hypothesized that younger children would be lower on Benevolence and on Conscientiousness, and higher on Extraversion (Lamb et al., 2002).

Method

Sample

The sample consisted of 252 girls (*Mean age* = 10.12, *SD* = 1.19) and 254 boys (*Mean age* = 10.15, *SD* = 1.19) all aged between 8 and 12 years. For further analyses, the sample was divided into three age groups: (a) 8-9 years (81 girls and 77 boys), (b) 10 years (81 girls and 81 boys), (c) 11-12 years (90 girls and 96 boys). 74.2% of the children were rated by their mother, 10.7% by their father, and 15.1% by both parents completing together one questionnaire. The sample was recruited in five different state schools in the French-speaking part of Switzerland.

Measures

The French version of the Hierarchical Personality Inventory for Children (Mervielde & De Fruyt, 1999, 2002; Rossier et al., 2007) consists of 144 items assessing five broad dimensions: Extraversion (E), Benevolence (B), related to FFM's Agreeableness domain, Conscientiousness (C), Emotional Stability (S), related to FFM's Neuroticism but its content is more restricted, and Imagination (I) related to FFM's Openness to Experience domain or Big Five's Intellect or Culture dimension (De Fruyt, Mervielde, Hoekstra, & Rolland, 2000). Responses are made on a five-point Likert type scale, ranging from "barely characteristic" to "highly characteristic".

38 items representing each domains and facets of the HiPIC were selected by three experts in personality, child development and education, and rephrased at the first person. This selection was made according to the readability of these items for children. At least six items were selected per dimension. Because the selection of the 38 items was not done according to psychometric criteria, 32 items (items 5, 8, 18, 25, 27, 30, 32, 34, 40, 42, 47, 53, 55, 64, 67, 70, 71, 77, 80, 86, 91, 92, 93, 94, 101, 102, 103, 114, 117, 128, 130, 133) were selected out of the 38 according to 2 criteria, considering parents ratings: 1. correlation with the original domains, and 2. internal reliability. Items 15, 28, 81, 87 and 111 were removed. Indeed their corrected item-total correlations were below .30 and all of them contributed negatively to the internal reliability of the scales. Item 72 contributed only very weakly to the internal reliability of its scale and was also removed. Thus, children were asked to answer 38 items but the results presented concern only the 32 selected items. The following items are representative of the kind of questions parents were asked to answer: (E) "keeps feelings and thoughts to him/herself", (B) "find it hard to share with others", (C) "leaves everything lying around", (S) "is afraid of making mistakes", (I) "likes to draw".

Procedure

After obtaining the parental agreement, the HiPIC was distributed in classrooms by teachers to children who had to bring the questionnaire to their parents. This procedure was used after

agreement of the State Department of Education in more than 42 classes from five state schools in the French part of Switzerland. Parents were asked to rate their children using the 144-item version and could return the questionnaire free of charge directly to the Institute of Psychology of the University of Lausanne, in order to warranty an anonymous participation. Participant rates for parents' assessment of each age group were respectively 61 % for 8-9 years, 70 % for 10 years and 56 % for 11-12 years. Children answered the 38 selected questions in their classroom. Teachers explained instructions to their pupils, verified that items were understood and answered children's questions. Each questionnaire had a code in order to pair self- with parents' ratings. Families did not receive any indemnity or compensation for their participation but a short report on the study was send on request. This research complies with the ethical rules of the Swiss Federation of Psychologists (FSP) and the American Psychological Association (APA).

Results

Parent's rating

Table 1 summarizes means, standard deviations and alphas for the parent's ratings. As means did not significantly differ relative to the informer (father, mother, both parents), parent's ratings were presented as a whole. The internal consistencies (ranging from .86 to .93) and the means of the 144 items version were similar to those found in the original Flemish version of Mervielde and De Fruyt (1999). Internal consistencies of the 32 items were lower and ranged from .58 to .77 (*Mdn* = .70). The alphas of the 32 items stayed reasonable ($\alpha \geq .70$) except for Imagination, which showed a lower internal consistency ($\alpha = .58$). Moreover, after correcting for the number of items using the Spearman-Brown prophecy formula, the internal consistencies were very similar to those of the 144-item version and ranged from .88 to .95 (*Mdn* = .92). The mean scores obtained with the 32 items were compared to the scores obtained with the 144 items version. The differences were significant for four of five domains: Extraversion, $t(505) = 3.40, p = .001$, Benevolence, $t(505) = -2.17, p = .03$, Conscientiousness, $t(505) = 7.24, p < .001$, Emotional Stability, $t(505) = -10.23, p <$

.001. Mean Extraversion and Conscientiousness scores were slightly higher and mean Benevolence and Emotional Stability scores were slightly lower for the 144 items version. However these differences were associated with a negligible effect size ($d < .20$) except for Emotional Stability, which was associated with a small effect size ($d = .22$). Furthermore, high correlations between the short and the full scales were observed, .84 to .92 ($Mdn = .89$).

- Table 1 -

A principal components exploratory factor analysis with varimax rotation of the parental 32 items selection was conducted to verify the structural validity. Cattell's scree test suggested extracting five factors explaining 47.6% of the total variance. The first seven Eigenvalues were 6.24, 3.29, 2.45, 1.80, 1.46, 1.35, and 1.15. We found a one-to-one association between the five factors and the five theoretical domains of this 32 items selection of the HiPIC. Factor I correlated with Conscientiousness, $r = .91$; Factor II correlated with Benevolence, $r = .90$; Factor III correlated with Extraversion, $r = .72$; Factor IV correlated with Emotional Stability, $r = .92$; and Factor V correlated with Imagination, $r = .73$. The structural validity of the 32 items selection was not perfect, but good enough considering held that items were selected for their ease of understanding.

Structural comparison of parents' and children's ratings

Factor analysis of the children's ratings allowed extracting five factors explaining 37.5% of the total variance. The loading matrix obtained with children's ratings was subjected to an orthogonal Procrustes rotation using the parents' ratings as the target. The total congruence coefficient was .90 (see Table 2). The congruence coefficients for factors ranged from .80 to .95 ($Mdn = .92$). Only the congruence for Imagination was lower than .85. At the item level the congruence coefficients ranged from .56 to .99 ($Mdn = .92$). Three items showed congruence coefficient lower or equal to .80. Thus children's ratings factorial structure was very similar to parents' ratings factorial structures.

- Table 2 -

In order to evaluate the age-trend of similarities between children's and parents' ratings factorial structure, the total sample was divided in three age-group: 8 to 9 years, 10 years, and 11 to 12 years. After factor analyses, the loading matrixes obtained with each group were subjected to an orthogonal Procrustes rotation using the parent's ratings as the target. For the younger, the total congruence coefficient was .73 and the congruence coefficients for factors ranged from .65 to .83 (*Mdn* = .71). For the ten years old, a total coefficient of .82 was found and congruence coefficients for factors ranged from .60 to .94 (*Mdn* = .82). For the older, the total congruence coefficient was .87 and ranged from .71 to .93 (*Mdn* = .91) for the factors. Consequently the structural congruence between the parents' and the children's ratings was higher for older children.

We also examined whether the factor structures of both children's and parents' ratings depend on the age. For self-ratings, orthogonal Procrustes rotations using 11 to 12 years old children as the target showed total congruence coefficients of .74 for both 8 to 9 and 10 years. Congruence coefficients for factors ranged from .72 to .76 (*Mdn* = .73) and from .52 to .88 (*Mdn* = .73), respectively. Total congruence coefficients were higher for parents' ratings, .81 for age group 8 to 9 and .85 for the ten years old, as were congruence coefficients for factors ranging from .60 to .95 (*Mdn* = .81) for the younger and from .71 to .94 for the ten years old (*Mdn* = .88). Again, the structural congruence was higher for older children.

Descriptives for parents' and children's ratings

As shown in Table 3, the internal consistencies of each dimension for children's ratings ranged from .46 to .69 (*Mdn* = .58) what was slightly lower than those for parent's ratings from .58 to .77 (*Mdn* = .70). Thus, children seemed less able than adult to give homogenous responses to items that belonged to a same domain. Concerning age groups differences, the internal consistencies ranged from .64 at 8-9 years old to .73 at 11-12 years in parents' ratings, $F(157,185) = 1.33, p < .001$. A parallel difference of internal consistencies was observed in children's ratings, ranging from .49 at 8-9 years old to .60 at 11-12 years old, $F(157,185) = 1.28, p = .002$. Imagination and

Extraversion were the less consistence domains in the three groups of age. On the contrary, Conscientiousness seemed to be the most homogenous dimension described by children. These results showed significant group differences of alphas for each domain, older children having higher alphas, except for Benevolence as rated by parents, which was already high for the 8-9 years group.

- Table 3 -

Mean correlation between parents' and children's ratings

The total mean correlation between the parents' ratings and children's self-description was relatively low: .36 (see Table 4). Correlations for the domains Extraversion, Benevolence, Conscientiousness, Emotional Stability and Imagination, were respectively .32 ($p < .001$), .29 ($p < .001$), .44 ($p < .001$), .31 ($p < .001$), and .44 ($p < .001$). When considering the different groups of age, correlations ranged from .15 to .31 ($Mdn = .21$) for the 8 to 9 years, from .24 to .52 ($Mdn = .32$) for the 10 years, and from .36 to .51 ($Mdn = .46$) for the 11 to 12 years. These results showed that the agreement between children and parents' ratings depends on the age ($z = -2.39, p = .008$). This agreement was significantly higher for older children and for all dimensions, except Emotional Stability. In order to control for the difference of the internal reliabilities, correlations were corrected for attenuation. After this correction, the overall age group difference of this agreement was even stronger ($z = -3.79, p < .001$). Taking the reliabilities into account, these correlations were relatively high at 11 and 12 years.

- Table 4 -

Personality traits

Descriptives of means and standard deviation for both parents' and children's ratings are shown in Table 5. According to the parents' ratings, children's personality is nearly the same at 8-9 year old and at 11-12 year old. After controlling for gender, considered as a covariate, younger children had significantly higher mean scores on Imagination, $F(2, 502) = 4.24, p = .01, (\eta^2 = .02)$.

On the contrary, no significant age group differences were observed for the four other domains:

Extraversion, $F(2, 502) = 2.78, p = .06 (\eta^2 = .01)$, Benevolence, $F(2, 502) = .04, p = .95 (\eta^2 < .01)$, Conscientiousness, $F(2, 502) = .68, p = .51 (\eta^2 < .01)$, and Emotional Stability, $F(2, 502) = 1.28, p = .28 (\eta^2 < .01)$. Moreover, a series of two-way ANOVAs with gender and age as factors showed a significant gender effect for Conscientiousness, $F(1, 500) = 15.65, p < .001 (\eta^2 = .03)$, and Imagination, $F(1, 500) = 12.17, p = .001 (\eta^2 = .02)$, girls having higher scores on these two dimensions. The gender by age interactions were always non significant.

However, according to the children's self-perception, there were significant age group differences in personality traits. After controlling for gender, the younger children scored higher on Benevolence, $F(2, 502) = 11.59, p < .001 (\eta^2 = .04)$, on Conscientiousness, $F(2, 502) = 19.17, p < .001, (\eta^2 = .07)$, and on Imagination, $F(2, 502) = 5.68, p = .004, (\eta^2 = .02)$. The modest differences observed for Extraversion, $F(2, 502) = 3.45, p = .03 (\eta^2 = .01)$, and for Emotional Stability, $F(2, 502) = 2.73, p = .06, (\eta^2 = .01)$, were not significant. So parents and children agree only about the higher mean scores of younger children on Imagination. Concerning children's self-perception, a series of two-way ANOVAs with gender and age as factors showed a significant gender effect for Benevolence, $F(1, 500) = 5.39, p = .021 (\eta^2 = .01)$, Conscientiousness, $F(1, 500) = 6.79, p = .009 (\eta^2 = .01)$, and Emotional Stability, $F(1, 500) = 22.70, p < .001 (\eta^2 = .04)$, girls scoring higher on Benevolence and Conscientiousness and lower on Emotional Stability. Again, the gender by age interactions were always non significant.

- Table 5 -

Finally, the agreement between parents and children seemed relatively low in relation to the global mean level of Extraversion, $F(1, 504) = 12.08, p = .001 (\eta^2 = .02)$, Benevolence, $F(1, 504) = 12.15, p = .001 (\eta^2 = .02)$, Conscientiousness, $F(1, 504) = 3.88, p = .04 (\eta^2 = .01)$, Emotional Stability, $F(1, 504) = 3.87, p = .05 (\eta^2 = .02)$, and Imagination, $F(1, 504) = 22.37, p < .001 (\eta^2 = .04)$. Parents described children as more extraverted, less agreeable, conscientious and

emotionally stable, but more imaginative than children themselves. However, the agreement in terms of mean levels seemed again higher for older children.

Discussion

The aim of this study was to investigate the reliability of a self-report questionnaire measuring personality in children aged 8 to 12 years old. Hypotheses were that structural validity, internal consistencies and agreement between parent's and children would be higher at 11-12 years than at 8-9 years and that some domains such as Benevolence and Conscientiousness would also be higher in older children, in contrary to extraversion that would be lower.

The psychometric properties of the 32 items selection of the HiPIC's were first studied. Internal consistencies were, not surprisingly, lower than for the 144 items version, but remained reasonable except for Imagination. This domain included 2 items assessing Creativity, 1 referring to Curiosity and 2 evaluating Intellect. The number of items was probably too low to measure accurately such a heterogeneous domain. Indeed, analyses of the 144 items version structure showed that two out of the three Imagination's facet scales had secondary loadings (Mervielde & De Fruyt, 2002; Rossier et al., 2007). The facet Intellect had secondary loadings on factors associated with Conscientiousness domain and Emotional Stability and the facet Curiosity had a high secondary loadings on a factor associated with Conscientiousness. Overall, the 32 items selection showed good correlations with the full-scale version and factorial analysis confirmed its structural validity, so this items selection could be used to compare parent's ratings with children's perceptions.

At a structural level, congruence coefficients between parents' ratings factorial structure and children's ratings factorial structure seemed to be higher for older children. At age 11 and 12, a high congruence coefficient were even observed for Benevolence, Conscientiousness, and Emotional Stability, and a borderline congruence coefficient for Extraversion and Imagination. This result confirmed the validity of FFM model with children's self-reports measures of personality.

As expected, this study also showed that children aged 11-12 years had higher internal consistency of their self-perception than younger children and higher agreement with the parents' perception of children's personality, except for Emotional Stability where correlations were similar for the different age groups. At age 11 and 12, the mean correlation is even high considering the number of items and the internal consistencies of the scales. The higher correlations between children and parents' ratings were obtained with Conscientiousness and Imagination. Low child-parent agreement on Extraversion was a surprising result, because Extraversion typically showed the highest self-other correlations in adults' studies (McCrae et al., 2004). Extraversion, Benevolence and Emotional Stability, which all involved social or interaction components, might be more influenced by subjectivity. The higher congruence of the structures and the higher internal consistencies of the older children could be related to the development of child's abilities to describe one's own characteristics as suggested by Barenboim (1981), Eder and Mangelsdorf (1997), and Harter (2006). In other words, this could be seen as the development of the James's Me-self. However, this hypothesis should be tested using a longitudinal design.

Parents' ratings showed the same significant age group differences of the internal consistencies. This result might be explained by the higher coherence of the ways in which older children think, feel, and act, in other words of the coherence of children's personality (Roberts & Del Vecchio, 2000). This higher coherence in older children could then be related to the development of the James's I-self, hypothesis, which should be further tested using a longitudinal design. An alternative explanation might be that the structure and the content of young children's personality are different and the lack of both consistency and agreement at 8-9 years old is due to the mismatch between different personality structures.

Regarding the age group differences of mean scores for each domains of the HiPIC, hypotheses were not confirmed. Unexpectedly, the parents' ratings only showed that younger children scored higher on Imagination, but not on Extraversion, Benevolence, Conscientiousness

and Emotional Stability. Moreover, the children's self-descriptions indicated higher scores on Benevolence, Conscientiousness, and Imagination for younger children. These results did not or only partially reproduce the developmental pattern found by others (e.g. Lamb et al., 2002). Young children seemed, as self-rated and rated by their parents, more imaginative than older children. This might be related with a normal decrease with age of curiosity and imagination. But children's perceptions also indicated that older children present lower scores on Benevolence and on Conscientiousness. As parents' ratings did not show a difference on these two domains, it was difficult to know if the older children really had different behaviors or if they judged themselves in a more strictly way. The differences between children's and parents' ratings suggested that mean scores were sensitive to the assessment procedure and that the effect sizes are usually small.

The HiPIC is a valid and reliable instrument for assessing children's personality (Mervielde & De Fruyt, 2002). The attempt to use an items' selection of the HiPIC with children from 8 to 12 is promising. Nevertheless this 32 items selection of the HiPIC is still lacking of good psychometrics properties. This might be due to the process of items' selection and the low number of items for each dimension, especially for Emotional Stability and Imagination. Our goal was to select items easy to understand for the children and to reduce the evaluation time, but strict psychometrics criteria should be used to enhance the reliability of the test. Additionally, the HiPIC was developed relying on parental and teacher ratings of children's personality. Children, especially those aged 8 to 9 years, might be more reliable if they are proposed to rate themselves along personality categories that are meaningful for them. Finally, the age differences observed in this cross-sectional study should be further examined using a longitudinal design, allowing observing unbiased developmental changes.

Further research is then needed to develop comparison within the different sources for measuring personality differences among children. Multiple sources of assessment and longitudinal setting are not only stimulating methodological challenges, but they are also promising ways to

establish closer links between studies of temperament, using observations or parent-reports (Rothbart & Bates, 2006), and research on personality traits, mainly using self-reports. Much more work is also needed to specify lower-order traits or facets, which seem specific to the child. The latest taxonomy of higher-order and lower-order personality traits proposed by Caspi and Shiner (2006) could help to construct new instruments adapted to children and adolescents. Nevertheless, the findings from this cross-sectional study suggest that children aged 11-12 years presents higher ability to describe one's own personality traits as measured by a FFM instrument than children aged 8-9 years. However, understanding the reasons of this difference remains a major challenge for researchers in personality development.

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Table 1

Means, standard deviations, alphas and correlation between the original and the selected 32 items of the HiPIC

<i>Parents' ratings</i>	<i>HiPIC</i>				<i>32 items selection</i>				<i>r</i>	<i>d</i>
	<i>Nb</i>	α	<i>Mean</i>	<i>SD</i>	<i>Nb</i>	α	<i>Mean</i>	<i>SD</i>		
Extraversion	32	.88	3.62	.52	6	.70	3.57	.72	.84	.10
Benevolence	40	.91	3.54	.53	9	.77	3.57	.67	.92	.04
Conscientiousness	32	.93	3.38	.66	7	.74	3.28	.76	.91	.15
Emotional Stability	16	.86	3.20	.68	5	.70	3.36	.77	.89	.22
Imagination	24	.91	3.95	.59	5	.58	3.94	.66	.85	.01

Table 2

Structural comparison of parents' and children's ratings

<i>Age</i>	Congruence coefficients					<i>Total</i>
	<i>E</i>	<i>B</i>	<i>C</i>	<i>S</i>	<i>I</i>	
8-9 years (<i>N</i> = 158)	.65	.78	.70	.83	.71	.73
10 years (<i>N</i> = 162)	.74	.90	.94	.82	.60	.82
11-12 years (<i>N</i> = 186)	.81	.91	.92	.93	.71	.87
Total	.87	.92	.94	.95	.80	.90

Note. E = Extraversion; B = Benevolence; C = Conscientiousness; S = Emotional Stability; I = Imagination.

Table 3

Alpha according to age for parents' and children's ratings

<i>Age</i>	<i>Parent's ratings</i>						<i>Children's ratings</i>					
	<i>E</i>	<i>B</i>	<i>C</i>	<i>S</i>	<i>I</i>	<i>Mean</i>	<i>E</i>	<i>B</i>	<i>C</i>	<i>S</i>	<i>I</i>	<i>Mean</i>
8-9 years (<i>N</i> = 158)	.67	.78	.59	.66	.51	.64	.43	.54	.56	.53	.38	.49
10 years (<i>N</i> = 162)	.69	.79	.77	.65	.56	.69	.43	.68	.69	.58	.44	.56
11-12 years (<i>N</i> = 186)	.73	.75	.77	.76	.63	.73	.53	.63	.70	.60	.53	.60
Total	.70	.77	.74	.70	.58	.70	.46	.64	.69	.58	.47	.57

Note. E = Extraversion; B = Benevolence; C = Conscientiousness; S = Emotional Stability; I = Imagination.

Table 4

Mean correlation between parents' and children's ratings

<i>Age</i>	Correlations					<i>Mean</i>
	<i>E</i>	<i>B</i>	<i>C</i>	<i>S</i>	<i>I</i>	
8-9 years (<i>N</i> = 158)	.17 (.32)	.15 (.23)	.25 (.43)	.31 (.52)	.21 (.48)	.22 (.39)
10 years (<i>N</i> = 162)	.32 (.59)	.24 (.33)	.49 (.67)	.24 (.39)	.52 (1.05)	.36 (.58)
11-12 years (<i>N</i> = 186)	.44 (.71)	.46 (.67)	.51 (.69)	.36 (.53)	.50 (.87)	.45 (.68)
Total	.32 (.56)	.29 (.41)	.44 (.62)	.31 (.49)	.44 (.84)	.36 (.57)

Note. E = Extraversion; B = Benevolence; C = Conscientiousness; S = Emotional Stability; I = Imagination. All correlations above .16 were significant ($p < .05$). Correlations corrected for attenuation appears in brackets.

Table 5

Personality traits evaluated by parents and children

<i>HiPIC 32 items</i>	<i>8-9 years</i>		<i>10 years</i>		<i>11-12 years</i>	
	Mean	SD	Mean	SD	Mean	SD
<i>Parent's ratings</i>						
Extraversion	3.66	.68	3.59	.71	3.47	.75
Benevolence	3.58	.65	3.58	.69	3.56	.66
Conscientiousness	3.34	.61	3.27	.82	3.24	.83
Emotional Stability	3.43	.71	3.36	.75	3.30	.83
Imagination	4.07	.59	3.92	.65	3.86	.72
<i>Children's ratings</i>						
Extraversion	3.49	.67	3.30	.61	3.37	.65
Benevolence	3.95	.52	3.74	.60	3.66	.57
Conscientiousness	3.91	.64	3.62	.71	3.44	.75
Emotional Stability	3.64	.76	3.50	.77	3.47	.78
Imagination	3.98	.57	3.80	.62	3.77	.65