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Patrick Perret, Miliana Ayad, Bruno Dauvier, Anne Congard. Self-and parent-rated measures of personality are related to different dimensions of school adjustment. *Learning and Individual Differences*, 2019, 10.1016/j.lindif.2019.02.007 . hal-02468678

HAL Id: hal-02468678

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Abstract

Links have often been drawn between individual personality differences among children, as captured by the Big Five personality traits, and academic achievement. Published research shows that conscientiousness is the most decisive factor, and its predictive power is greater when it is other- rather than self-assessed. In the current study ($N = 161$; $M_{\text{age}} = 10.79$ years), we examined the associations between both forms of personality assessment and two dimensions of school adjustment. Results confirmed that other-assessments are more statistically predictive of academic adjustment, but showed that self-assessments are more statistically predictive of subjective wellbeing at school. Complementary analyses in the form of generalized additive models indicated that the relationship between personality and wellbeing can follow either a linear or a nonlinear pattern, depending on which particular trait is considered. Such results may have practical implications for the choice of assessment method, and theoretical ones for the study of relations between personality and subjective wellbeing at school-an area that is still relatively unexplored.

Keywords: personality, academic adjustment, child development, Big Five, subjective wellbeing

Highlights

- Mothers' and children's ratings of personality were modestly correlated
- Mothers' ratings were better statistical predictors of academic adjustment
- Pupils' ratings were better statistical predictors of subjective school wellbeing
- The linearity of the personality-wellbeing relationship varied according to trait

1 Introduction

According to the Big Five theory (McCrae & Costa, 1997), variations in human personality are structured around five main traits: openness, extraversion, conscientiousness, agreeableness, and emotional stability (or neuroticism). Although this Five Factor Model (FFM) was derived from research with adults, a growing number of studies suggest that it also provides a heuristic framework for examining how children's personality is constructed and how it can influence varied facets of their developmental trajectories (Shiner & DeYoung, 2013). Several authors, for example, have suggested that these five personality traits constrain the way in which children adjust to different dimensions of the school experience (De Raad & Schouwenburg, 1996) and modulate their likelihood of encountering problems there (Ehrler, Evans, & McGhee, 1999).

Accordingly, children who are highly active and gregarious, with a tendency to be assertive (i.e. high level of *extraversion*), may find it easier to forge relationships with their peers and thrive on the many opportunities for social interaction available at school. For their part, children who have an inquiring mind and are interested in acquiring new knowledge (i.e., high level of *openness*) may be driven by intrinsic motivation, which is more beneficial for learning. Children who set themselves high standards in their work, are organized and persistently pursue their objectives (i.e. high level of *conscientiousness*) may adopt a mode of functioning that particularly favors academic achievement. Meanwhile, prosocial children who are attentive to their interlocutors (i.e. high level of *agreeableness*) may be quicker at forming bonds with adults based on trust and cooperation, making it easier for them to engage in the educational relationship and grasp the rules of how to behave in a school setting. Lastly, children who manifest little predisposition to feelings of distress (i.e., high level of *emotional stability*) may be more willing

to fit into school life.

Empirical research has confirmed that some components of children's personality are significantly predictive of their academic achievement. For example, when Laidra, Pullman, and Allik (2007) examined the links between intelligence, personality traits and academic performance in children and young people aged 7-19 years, they found that cognitive reasoning abilities were the best predictors of performance, but that conscientiousness and openness also made significant contributions. Data also highlight a growing role of conscientiousness across schooling, as teaching formats demand increasing autonomy from pupils in their work. Poropat (2009)'s meta-analysis confirmed that conscientiousness is a factor for educational attainment that is independent of intelligence and just as decisive. Spengler, Brunner, and Martin (2013) showed that even when they are assessed using a very short personality questionnaire, conscientiousness and openness clearly help to explain children's academic results. A recent study using latent variable models (Lechner, Danner, & Rammsted, 2017) even supported the conclusion that, with regard to grades, personality alone explains almost twice the variance that intelligence does. Personality traits other than conscientiousness and openness seem less involved in academic performances (Poropat, 2014), but influence other dimensions of school adjustment. For instance, children's neuroticism has been found to predict teachers' assessments of their internalizing behaviors a few months after starting school (Zupancic & Kavcic, 2011), agreeableness has been found to predict children's social status within peer groups at primary school (Andrei, Mancini, Mazzoni, Russo, & Baldaro, 2015), and extraversion has been found to be associated with a higher level of behavioral problems at school (Goldner & Scharf, 2013). These consistent findings support Zupancic and Kavcic's (2011) view that "children differing in personality interpret and react differently to similar experiences, evoke different responses from others and actively tend to select or create different environments for themselves" (p. 500).

Consequently, school practitioners should pay close attention not only to children's intellectual development, but also to their emergent personality, through the use of suitable assessment tools.

Most of the currently available tools are questionnaires that contain statements reflecting different facets of the personality traits identified in the Big Five model. They do differ, however, in the identity of the informants. For example, the Hierarchical Personality Inventory for Children (HiPIC; Mervielde & De Fruyt, 2002) relies on parental accounts to gauge how children behave in their everyday lives. By contrast, Barbaranelli, Caprara, Rabasca, and Pastorelli (2003)'s Big Five Questionnaire–Children version (BFQ-C) is completed by the children themselves. Several studies have looked at how far the personality measures derived from these different types of assessment converge. Correlations have generally been found to be modest (e.g., Olivier & Hervé, 2015), especially for children of primary school age (Barbaranelli, Caprara, Rabasca, & Pastorelli, 2003). There are several possible explanations for these respondent-based (i.e., parent vs. child) divergences. For a start, children's perceptual acuity may depend on the maturation of their self-awareness and their ability to compare themselves with others (Quartier & Rossier, 2008). This would explain why parents and children's assessments tend to converge with age. A complementary explanation is that some personality dimensions are, by their very nature, more difficult for others to assess (Vazire, 2010). In a recent study, Luan, Hutteman, Denissen, Asendorpf, and Aken (2017) showed that traits which manifest themselves in visible behaviors (e.g., extraversion and conscientiousness) tend to elicit higher interrater agreement than less visible traits (e.g., emotional stability and openness).

Because of these divergences, both practitioners and researchers may be in a quandary as to which of the two assessment types to choose. One useful strategy for making this choice is to examine the respective validity of each one. In 2014, Poropat carried out a fresh meta-analysis, this time looking specifically at studies (with samples of students aged 16-30 years) that had used

personality ratings provided by other informants (parents, teachers or peers). As well as confirming the specific effects of conscientiousness and openness, results also and above all revealed that other-rated assessments of personality are considerably more predictive of educational attainment than self-assessments. Taking the analysis one step further, MacCann, Lipnevich, Poropat, Wiemers, and Roberts (2015) showed, with a sample of students aged 13-16 years, that this observation is not simply due to greater internal consistency of parental assessments. Rather, the divergences in predictive power stem from the nature of the information and comparisons used by informants to respond to personality questionnaires. The authors' methodological conclusion was that other-assessments are more valuable in educational and research studies examining the impact of personality on academic achievement.

Nevertheless, the divergence between parents' and children's personality assessments does not mean that self-assessments are baseless and invalid, but rather that they rely on different information from that used by external observers to establish a judgment. In a recent longitudinal study, for instance, Luan, Hutteman, Denissen, Asendorpf, and van Aken (2017) showed that parents have more positive perceptions of changes in their children's personality during the transitional period of adolescence than the children do themselves. Another longitudinal study (Clark, Durbin, Hicks, Iacono, & McGue, 2017) suggested not only that "the story of personality in middle childhood differs a bit based on who is telling it" (p. 140), but also that the predictive validity of these different sources varies according to which area is being explored.

As we suggested earlier, different personality traits are liable to influence different dimensions of school adjustment. While academic performances undeniably constitute a core dimension, they certainly do not represent the sum total of children's experience of school. For example, Zee, Koomen, and Van der Veen (2013) found that the pupil-teacher relationship is predicted by different personality traits from those that usually influence educational attainment.

More generally, children's subjective wellbeing at school could be a key dimension not only of their current experience but also of their school trajectory (Samdal, Wold, & Bronis, 1999), as long as subjective wellbeing appears to play a causal role in the achievement of many positive outcomes, including sociability, altruism, effective conflict resolution skills, and original thinking (Lyubomirsky, King, & Diener, 2005). Research has therefore been undertaken to better define the concept of subjective school wellbeing (e.g., Garcia-Bacete, Marande-Perrin, Schneider, & Blanchard, 2013) which refers to children's self-perception of their school experiences as conveying positive emotions and thoughts. A themed analysis of research in this area recently led Renshaw, Long, and Cook (2015) to identify four dimensions of children's experiences that together contribute to such a positive perception of their school life: School connectedness, joy of learning, educational purpose, and academic efficacy. Within this framework, subjective school wellbeing is regarded as an emergent phenomenon rising from diverse converging factors.

Despite numerous studies indicating that personality is one of the major influences on adults' subjective wellbeing (e.g. Steel, Schmidt, & Schultz, 2008), its impact on pupil wellbeing continues to receive far less attention. Furthermore, personality studies have generally assumed that the variables being investigated are linearly related. More recently, researchers in the field have begun to pay more consideration to arguments in favor of curvilinear relationships (e.g., Carter, Guan, Maples, Williamson, & Miller, 2016; Nickel, Roberts, & Chernyshenko, in press). Nonlinear predictions frequently stem from what Pierce and Aguinis (2013) called the *too-much-of-a-good-thing-effect* in the management literature, that is, when a valuable and generally adaptive individual characteristic reaches a point beyond which the relationship with a desirable outcome becomes either asymptotic or negative. For instance, one could hypothesize that children who are attentive to other pupils' emotions and needs (i.e., with high agreeableness) may benefit from fulfilling social interactions at school, as this enhances their feelings of

connectedness (a facet of subjective school wellbeing). However, one could equally well hypothesize that an extreme level of agreeableness also makes children *excessively* sensitive to the interpersonal challenges that are inherent to the school context, to the point of reducing their subjective wellbeing.

In the present study, we asked children aged 9-13 years, along with one of their parents (mother), to complete a short form of the HiPIC so that both assessments were made with the same instrument. The HiPIC is one of the few inventories specifically intended to assess children's personality according to the FFM, and it is the only French-language tool available with norms for clinical practice. Furthermore, Quartier and Rossier (2008) developed a shortened version specifically designed for self-reports, by selecting items on their ease of understanding and readability for school-aged children. Their validation study (Quartier & Rossier, 2008) indicated that the short form had good correlations with the full-scale version, and factorial analyses confirmed its structural validity. Each child also completed the Student Subjective Wellbeing Questionnaire (Renshaw, Long, & Cook, 2015) so that we had a general indicator of their wellbeing at school. As mentioned above, school wellbeing is here envisaged as a metaconstruct encompassing four main first-order constructs, each with its own substantive validity. The validation process that the authors undertook revealed a statistically robust multidimensional latent-trait structure, with general subjective wellbeing as a second-order construct. Lastly, each child's lead teacher filled in a questionnaire about his or her level of academic adjustment, taken from the School Adjustment Scale (Congard, Perret, & Moreau, 2016). In view of the theoretical and methodological issues raised in the literature about the links between personality and school adjustment, the study was designed to tackle three main research questions (RQ):

(RQ 1) How far do children and parents' judgments of personality traits coincide? Previous

studies using comparable instruments and designs (e.g., Bouvard, Denis, & Roulin, 2015) led us to anticipate moderate correlations between parents' and children's judgments, as well as an increase in convergence with age.

(RQ 2) Is the greater predictiveness of parental judgments of personality restricted to academic adjustment, or does it extend to children's subjective wellbeing at school? Informed by previous research (Poropat, 2014), we expected other-rated measures to be better statistical predictors of academic adaptation than self-rated measures, but we could offer no such hypothesis regarding the prediction of children's subjective wellbeing. More specifically, and whatever the informant, we expected conscientiousness to be the main personality trait related to academic achievement. Children with high level of conscientiousness tend to be orderly, planful and persistent in their activities. Transposed in a school context, these cognitive and behavioral features should favor children's adjustment to schoolwork requirements and teachers' expectancies.

(RQ 3) Which Big Five traits are most strongly associated with pupils' subjective school wellbeing? More specifically, although conscientiousness is regularly recognized as the most decisive dimension of personality for academic achievement, we hypothesized that personality traits that are more related to social relations (i.e., agreeableness and extraversion) would be also associated with school wellbeing, inasmuch as the latter concept incorporates not only a sense of academic efficacy but also a sense of social connectedness. Furthermore, we wanted to investigate whether the associations between personality traits and subjective wellbeing at school can best be described by linear or curvilinear relationships. In the present study, the use of generalized additive models (GAMs; Wood, 2006) allowed us to examine the occurrence of nonlinear relationships of this type in our dataset.

2 Method

2.1 Participants

Participants were 161 children (81 boys and 80 girls) with a mean age of 10.79 years ($SD = 1.16$, range = 9-13). They were recruited in five different elementary and middle schools in the South of France. A total of 46 children were in Grade Four (mean age = 9.56 years, $SD = .50$), 53 were in Grade Five (mean age = 10.47 years, $SD = .50$), 35 in Grade Six (mean age = 11.61 years, $SD = .49$), and 27 in Grade Seven (mean age = 12.44 years, $SD = .57$).

2.2 Measures

2.2.1 Personality

The children's personality was assessed both by themselves and by their mothers, via the French short version of the HiPIC (Quartier & Rossier, 2008), which comprises 32 items assessing the Big Five personality traits: conscientiousness (e.g., "Leaves everything lying around"); extraversion (e.g., "Keeps feelings and thoughts to him/herself"); benevolence (related to the FFM's agreeableness domain; e.g., "Finds it hard to share with others"); imagination (related to the FFM's openness domain; e.g., "Likes to draw"); and emotional stability (or neuroticism; e.g., "Is afraid of making mistakes"). Items were framed in the first or third person, depending on the informant (child or mother). Participants indicated their degree of agreement with each statement on a five-point Likert scale ranging from *Strongly disagree* to *Strongly agree*. In the present study, internal consistencies varied considerably with trait and informant (see Table 1).

2.2.2 Academic adjustment

Teachers indicated children's overall academic adjustment on the corresponding subscale of the School Adjustment Scale (Congard, Perret, & Moreau, 2016). This comprises eight items rated on a 5-point Likert scale ranging from *Strongly disagree* to *Strongly agree*. The term *academic adjustment* refers to the grades achieved by children, but also to their attitudes toward

learning in general, which are known to promote academic achievement. The subscale explores four dimensions: academic results (e.g., “The pupil achieves good results in evaluations”); attention (e.g., “The pupil shows concentration during class”); autonomy (e.g., “The pupil can work on his or her own”); and motivation (e.g. “The pupil seems to be curious and interested by what he or she learns”). In the present study, the Academic Adjustment subscale had satisfactory internal consistency (Cronbach’s alpha = .95).

2.2.3 Subjective wellbeing at school

The Student Subjective Wellbeing Questionnaire (SSWQ) is a 16-item self-report questionnaire designed to explore four dimensions of subjective school wellbeing. *School connectedness* refers to the extent to which the child feels cared for at school and how well he or she gets on with others (e.g., “I feel like people at this school care about me”). *Academic efficacy* is related to the child’s appraisal of his or her ability to meet the academic requirements (e.g., “I do well on my class assignments”). *Joy of learning* refers to the satisfaction experienced by the child when he or she engages in classroom activities (e.g., “I feel happy when I am working and learning at school”). *Educational purpose* corresponds to the child’s appraisal of school as a meaningful context for learning and development (e.g., “I believe the things I learn at school will help me in my life”). A composite score representing the pupil’s general subjective wellbeing is obtained by summing the subscores. In the present study, internal consistency was high (Cronbach’s alpha = .91).

2.3 Procedure

After obtaining the consent of the local education authorities and school principals, parents were informed about the study. Envelopes containing a written consent form, an explanatory letter, and the child personality inventory to fill in at home were distributed in the classrooms. Parents who gave their consent were asked to sign the form, fill in the questionnaire and return

them in the envelope to the child's lead teacher. Research assistants went into the classrooms to brief small groups of children on the study, ensure that they answered all the questions on their own, and give any support that was needed. Children assessed their personality traits and wellbeing at school via the abbreviated HiPIC and Student Subjective Wellbeing Questionnaire with no time restriction. Finally, the lead teachers filled in the Academic Adjustment subscale. Participation was voluntary and anonymity was guaranteed. The complete participation rate was 89.4%. The ethics committee of Aix-Marseille University approved the protocol of this experiment, which complied with ethical standards for the treatment of human samples.

2.4 Data analyses

We began by measuring correlations between the children's and parents' personality assessments for the whole sample in order to estimate the degree of agreement between the two. Next, to analyze how these correlations changed with the children's age, we calculated variable coefficient models (Hastie & Tibshirani, 1993) for each personality trait. More specifically, these multiple regression models showed how far the self-assessment values were explained by other-assessment values interacting with age. We also calculated multiple regression analyses, then GAMs, to examine links between our two dependent variables (academic adjustment and pupil wellbeing) and the children's self- and other-assessed personality traits. A GAM is a generalized linear model in which the response variable depends on a set of smooth nonlinear functions of some predictor variables. The approach is similar to a polynomial regression that automatically selects the level of nonlinearity required to describe the data. It therefore allows smooth nonlinear relationships between the predictors and the dependent variable to be identified. A model selection mechanism is integrated within the fitting procedure so as to retain only the nonlinear

effects that deviate significantly from a linear relationship. GAMs were estimated with the *mgcv* package (Wood, 2001) in R software (R Core Team, 2017).

3 Results

Descriptive statistics for the self- and other-assessed personality variables and their correlations are set out in Table 1. Analysis of scores on the Academic Adjustment subscale ($M = 31.5$, $SD = 7.2$) and Student Subjective Wellbeing Scale ($M = 63$, $SD = 10.1$) revealed good internal consistency. Cronbach’s alphas for children’s ratings on the HiPIC abbreviated version were quite low (ranging from .52 for agreeableness to .64 for emotional stability) but they were somewhat comparable to the reliability coefficients reported by previous studies using the same instrument. Internal consistency of parent’s ratings on the HiPIC slightly exceeded that of children, with alphas extending from .61 for emotional stability to .77 for conscientiousness.

To detect age-related changes in the agreement between children’s and adults’ personality trait judgments, as well as possible differences in these changes across traits (RQ 1), we calculated variable coefficient models (Hastie & Tibshirani, 1993) for each trait. Descriptively, the agreement between children’s and mother’s assessments increased with age for extraversion, and either remained stable or fell slightly for the four other traits. However, none of these interactions was statistically significant.

Table 1

Descriptive Statistics for the Link between Self- and Other-Assessments

Variables	<i>Other-assessment</i>				<i>Self-assessment</i>				Agreement
	<i>Number of items</i>	<i>M</i>	<i>SD</i>	<i>Alpha</i>	<i>M</i>	<i>SD</i>	<i>Alpha</i>		

A	9	31.9	5.5	0.67	30.7	5.1	0.52	0.19*
ES	5	14.2	3.7	0.61	16.9	4.2	0.64	0.32**
E	6	20.7	4.5	0.72	17.9	3.7	0.56	0.43**
C	7	22.9	5.5	0.77	25.9	5	0.58	0.35**
O	5	19.8	3.2	0.63	18.6	3.3	0.53	0.32**

Note. ES = emotional stability; C = conscientiousness; O = openness; E = extraversion; A = agreeableness. * $p < .05$. ** $p < .01$.

3.1 Personality, academic adjustment and subjective wellbeing at school: complementarity of the self- and other-assessments

Multiple regression analyses were used to answer our second research question, namely whether the greater statistically predictive value of parental versus children’s judgments of personality traits pertains not only to academic adjustment but also to pupil wellbeing.

Results showed that the children’s personality, as assessed by their mothers (i.e., other-assessment) accounted for 18.3% of the variance in their academic adjustment, compared with just 12.6% when it was assessed by the children themselves (i.e., self-assessment). Personality is therefore more closely associated with academic adjustment when it is assessed by the mother rather than by the child. When traits were assessed by the mothers, conscientiousness ($\beta = .319, p < .001$) and openness ($\beta = .198, p < .05$) predicted academic adjustment significantly positively, and extraversion ($\beta = -.170, p < .05$) significantly negatively. When traits were assessed by the children themselves, only conscientiousness was significantly and positively associated with children’s academic adjustment ($\beta = .354, p < .001$).

We ran multiple regression analyses to identify which of the Big Five traits were most statistically predictive of subjective wellbeing at school. Personality explained only 10.7% of the

variance when it was judged by mothers, but this figure rose to 31.5% when personality was assessed by the children themselves. Thus, in contrast to academic adjustment, pupil wellbeing was better predicted by assessments of overall personality when these were produced by the children themselves. In the other-assessments, only conscientiousness ($\beta = .327, p < .001$) helped to explain differences in subjective school wellbeing, whereas in the self-assessments, pupil wellbeing was associated not only with conscientiousness ($\beta = .322, p < .001$), but also with agreeableness ($\beta = .169, p < .05$) and openness ($\beta = .248, p < .001$). In contrast to findings for adults, emotional stability did not appear to correlate with children wellbeing at school. This surprising finding raised the possibility that the relations between self-assessed personality traits and subjective wellbeing might be nonlinear in children. Regarding our third and final research question, we therefore calculated a GAM to investigate this possibility. In this model, 38.6% of the children's school wellbeing was explained by their self-assessed personality traits assessments. The model's parameters are set out in Table 2.

Table 2

Estimated Regressions and GAM Parameters for Studying the Effects of Self-Rated Personality on Subjective School Wellbeing

Variables	β	t	$p(t)$	edf	$p(\text{GAM})$
		5.607	< .001		
Agreeableness	0.169	2.305	0.022	3.32	.03*
Emotional stability	0.058	0.847	0.398	1.00	.33
Extraversion	0.045	0.670	0.504	2.92	.04*
Conscientiousness	0.320	4.413	< .001	2.11	< .01**

Openness	0.248	3.616	< .001	1.00	< .01**
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Note. β = beta; t = Student's t test; $p(t)$ = probability associated with t ; edf =

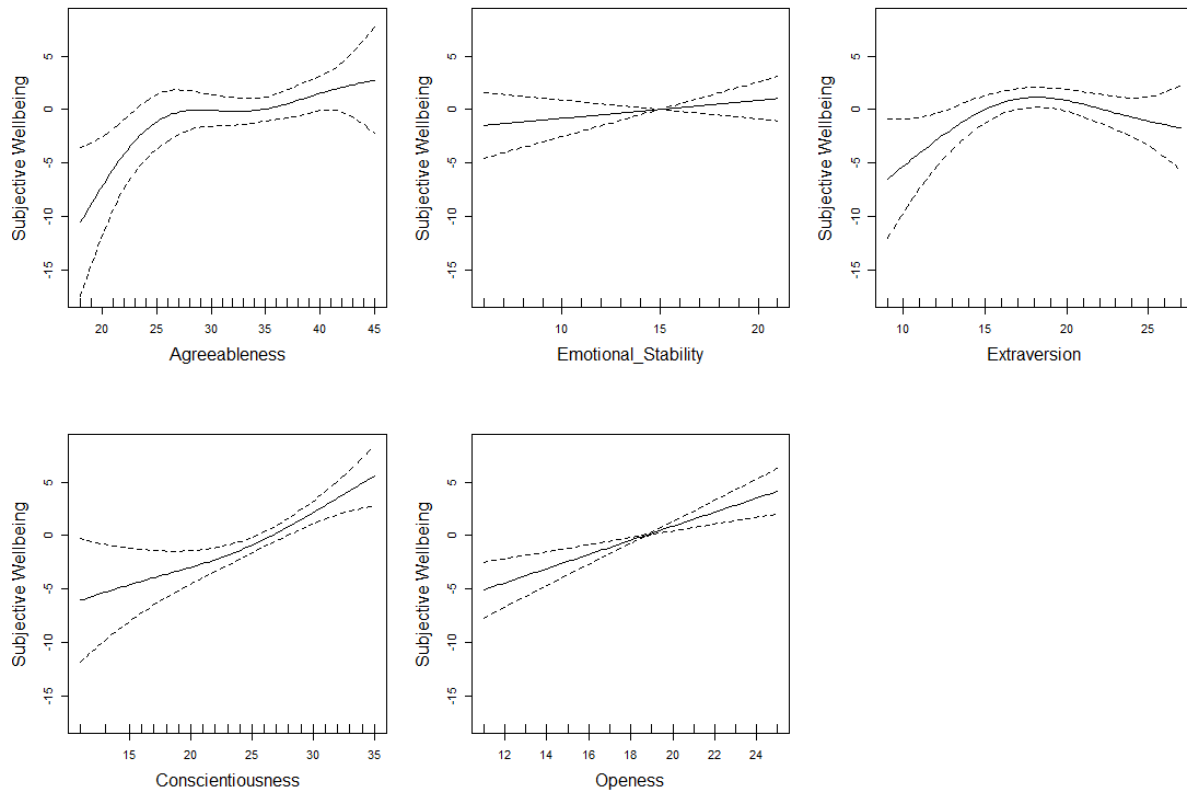
estimated degrees of freedom; $p(\text{GAM})$ = probability associated with GAM. * $p <$

.05. ** $p < .01$.

The results of the GAM revealed that, as we hypothesized (RQ3), personality traits linked to social relations were associated with subjective wellbeing at school: not only conscientiousness and openness, but also agreeableness and extraversion, helped to explain variance in the SSWQ (see Table 2). Figure 1 shows the relationship between mean pupil wellbeing (hence the negative values on the y-axis) and each of the five personality traits. The most markedly nonlinear effect was for agreeableness ($edf = 3.32, p = 0.03$). Children with the lowest level of agreeableness also had a low level of wellbeing, whereas children with either moderate or high levels of agreeableness differed little on wellbeing. The model also revealed a nonlinear effect of extraversion ($edf = 2.92, p = 0.04$). The most introverted children had a low level of wellbeing, as did the most extraverted ones. An intermediate level was therefore most favorable to school wellbeing.

Figure 1

Nonlinear effects of children's self-assessed personality traits on their subjective wellbeing at school.



4 Discussion

The present study explored how far self- and other-assessments of children’s personality coincide and how far these two forms of assessment are associated with two dimensions of school adjustment: academic adjustment and subjective school wellbeing. Our first objective was to investigate the convergence/divergence of children’s personality assessments according to the source of information (child or mother). Correlations between self- and other-assessments were significantly positive, indicating that parents and children generally coincided in their views of the latter’s overall personality under construction. Nevertheless, the modest nature of these correlations also showed that these judgments could not be seamlessly superimposed. The degrees of agreement did not seem to change significantly across the developmental period we

considered. We did, however, find variations when we looked at individual traits, with agreement ranging from .19 for agreeableness to .43 for extraversion. These variations could be interpreted in terms of the self-other knowledge asymmetry model (Beer & Vazire, 2017; Vazire, 2010), whereby judgments tend to coincide or diverge as a function of two main factors. The first of these is *observability*: some traits have more salient behavioral manifestations that help to increase convergence between judgments, as is the case for extraversion. The second factor is *evaluativeness*: some traits more clearly have a socially desirable pole that can affect the accuracy of judgments and reduce convergence, as is the case for agreeableness. Poropat (2014) further argued that other raters base their assessments on behavioral evidence rather than complex thoughts and feelings. This exclusive focus on externalized manifestations of personality could explain divergences between children and parents in the assessment of some personality traits, as well as the closer correlations of other-ratings with academic adjustment, which is behavioral in nature. This interpretive framework could extend to the closer correlations we found between children's ratings of their personality and subjective school wellbeing, given that both dimensions are grounded on inner thoughts and feelings that are not necessarily expressed in overt behaviors.

Indeed, the second result of our study was that the predictive power of self- and other-assessments seemed to depend on the dimension of adjustment. Our data are in line with the findings of Poropat (2009, 2014)'s two meta-analyses, showing that parental assessments of personality are more closely associated with academic adjustment than children's self-assessments, and highlight the particular link of conscientiousness and openness to pupils' ability to adopt an attitude that favors educational attainment. By contrast, when it came to predicting subjective wellbeing at school, the children's assessments of their personality had a greater value than those of their parents. Moreover, they revealed the potential involvement of a broader range of personality traits in explaining individual variability in pupils' subjective experience of school.

Here once again, conscientiousness and openness emerged as adaptive factors, but in contrast to our results for academic adjustment, we also found that individual variations in agreeableness and extraversion were associated with wellbeing at school. Accordingly, observations of divergences between parents' and children's personality ratings may not lead to the hasty exclusion of data yielded by self-assessments. Rather, both sources of information may prove valuable in research and clinical practice, providing their respective predictive power is taken into account.

One should note, however, that we found low internal consistencies for the shortened HiPIC, particularly for the children's self-reports (Table 1), which warrants attention. The Cronbach's alphas in our study were comparable to those reported by two previous studies using the same instrument. In Quartier and Rossier (2008)'s study, reliability for 10-year-old children's ratings ranged from .43 to .69 ($M = .56$). In Olivier and Hervé (2015)'s study, conducted with children in the same age range as ours, alphas ranged from .40 to .64 ($M = .49$). Laidra, De Fruyt, and Konstabel (2017) recently reported higher psychometric properties for a short version of the HiPIC in Estonian. Contrary to Quartier and Rossier's adaptation, this version was designed to be fulfilled by parents. Therefore, item selection did not rely on readability for children, but was merely driven by the highest alphas obtained with a preliminary longer version. This selection procedure led to stronger internal consistencies in the validation study, with final alphas exceeding .70 for all domain scales. Similar results were found for a short-form HiPIC in Norwegian that relied on an empirically driven procedure of item selection (Vollrath, Hampson, & Torgersen, 2016). Thus, it may be that a proper balance between good psychometric properties and suitability for children's self-reporting remains difficult to achieve.

One consequence of these low reliabilities, however, is that the relationships between children's self-ratings of personality and dependent variables may be questioned. Interestingly, MacCann, Lipnevich, Poropat, Wiemers, and Roberts (2015) theoretically predicted such an

asymmetry in the reliabilities of self and others' personality measures. They argued that external observers' ratings are grounded on a unique source of information (i.e. the child's behavior) in a restricted range of situations, which should result in a rather consistent set of information. In contrast, when answering a personality questionnaire, children rely on multiple sources of information (i.e. not only their behaviors, but also their motivations, feelings and beliefs), and take into account a more diverse array of situations in which their behaviors and emotions may vary, resulting in a less consistent picture of their reactional tendencies. MacCann, Lipnevich, Poropat, Wiemers, and Roberts (2015) then envisaged that the superiority of parents' reports in predicting outcome variables (such as academic achievement) could simply be the byproduct of more reliable measures, due to a lower proportion of measurement error in the observed score. Using correlations corrected for attenuation, their study ruled out this possibility, and the authors concluded that the differences in predictive validity between self and others' measures of personality should not be attributed to the higher internal consistency of parents' ratings. In light of these arguments and findings, we reasoned that the results of our study could hardly be interpreted as merely reflecting the weakness of the reliability of children's assessment. The fact that the children's ratings, despite a lack of consistency, seemingly captured facets of their personality that were significantly associated with meaningful outcomes, encourages to pursue the search for developmentally relevant tools.

GAM analyses further showed that the relationships between self-assessed personality traits and pupil wellbeing could take contrasting forms. Conscientiousness and openness both had linear relations with wellbeing, such that the more conscientious or open children were, the more likely they were to thrive at school. Agreeableness and extraversion, on the other hand, had nonlinear relations. It would therefore be inaccurate to state that the more extraverted children are, the more they flourish at school, as the GAM analyses indicated that moderate extraversion

was the optimum level for this dimension. When De Raad and Schouwenburg (1996) summarized the arguments linking extraversion to school adjustment, they provided two different predictions: extraverted students may have a high level of energy to invest in their school life, but may direct this energy toward socializing, to the detriment of their academic focus. The latter prediction may help to explain our finding that extraversion (when assessed by mothers) was negatively related to academic adjustment. A tentative interpretation could then be proposed for the emergence of the nonlinear effect. The first half of the inverted U-shaped curve may suggest that extraversion, as opposed to introversion, encourages children to invest in social relations and contributes to their feeling of wellbeing at school. The second half of the curve suggests that, beyond a certain threshold, this preoccupation with social relations could become detrimental to actual learning, to the extent that it compromises pupil wellbeing. Agreeableness had a different profile, as children with very low agreeableness ratings seemed to be at particular risk of failing to thrive at school. However, beyond a certain threshold, variations in agreeableness no longer seemed to be related to differences in wellbeing. A high level of agreeableness did not appear to compromise subjective wellbeing at school, but the relationship clearly contrasted with the linear ones observed for conscientiousness and openness.

The current study had a number of methodological limitations that could be addressed in future work. One of them is that personality traits and the dimensions of wellbeing were both measured via self-report questionnaires with comparable formats. The predictive superiority of the personality self-assessments may thus have been overestimated owing to a bias induced by common-method variance (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Avoiding this bias classically entails using external informants. In the present case, however, gauging subjective wellbeing was ontologically linked to the children's viewpoint on their internal experience of school. Furthermore, Kammeyer-Mueller, Steel, and Rubenstein (2010) have shown that even

distinct source designs are not immune to measurement caveats concerning the estimation of relationships between predictors and dependent variables. As suggested by an anonymous reviewer, one way of lending stronger support to the finding that children's and parents' ratings of personality have different predictive powers independently of source biases could be to make the pupils themselves assess their academic adjustment, and test whether parent-rated measures continue to be more strongly related. Another limitation of the study is the participants' age range, which may have been too restricted to allow us to detect developmental changes in the children's perceptions of their own personality, as well as changes in parent-child agreement. The sample size was also quite small when it came to considering interactions involving age effects. Another limitation is the cross-sectional and correlational design of the present study, which does not allow for causal inferences about the variables under our investigation. Future research using longitudinal designs could offer additional insights into the truly *predictive* validity of children's and parents' FFM assessments. It might also be useful to include control variables, such as parents' socioeconomic status or their own personality traits, which may influence both their reports about their children's personality and how they support their children's academic attainment (the finding of statistical predictive validity does not end the search for the underlying mechanisms of influence).

Due to this set of methodological limitations, the present results should be interpreted with caution. In particular, the low reliability of children's ratings on the HiPIC abbreviated form suggests that alternative assessment tools should be considered in future works. The present study helps to identify the methodological hurdles that will need to be overcome and call for the pursuit of researches investigating the respective validity of children's and parents' personality ratings rather than simply giving up using self-reports. Keeping in mind the limitations of our study, a

number of implications and directions for future research could be considered.

First, our results contribute to a growing body of data alerting professionals and researchers to the fact that children's burgeoning personality, like their intellectual skills, appears to be significantly associated with their school adjustment. The conceptualization and assessment of personality traits could help teachers gain a more accurate picture of their pupils' characteristics, allowing them to tailor the educational environment and their own relational strategies to the children's individual needs. Poropat (2014) suggested, for instance, that children with low levels of conscientiousness require more structured learning contexts, where tasks are broken down into separate steps and the teacher's expectations are more clearly signposted. He also argued that as personality traits seem more malleable and sensitive to experience than intellectual skills, they offer a means of helping children to progress faster and improving their academic functioning. Roberts, Luo, Briley, Chow, Su, & Hill (2017) recently conducted a meta-analysis that sought to investigate whether personality traits were amenable to significant and lasting changes in response to clinical interventions. This meta-analysis convincingly supported a plasticity principle whereby personality is best viewed as an open system liable to undergo substantial change. The literature reviewed by the authors only concerned adult studies, but as plasticity tends to decrease with age (Roberts, Wood, & Caspi, 2008), it seems reasonable to assume that children could be given opportunities to develop personality traits in ways that would help them cope with school challenges.

Second, our results indicate not only that personality is associated with achievement and academic adjustment, but also that this association may extend to children's subjective wellbeing at school. This relationship has been far less extensively investigated. The present study suggests that, contrary to the academic achievement dimension, for which conscientiousness is regarded as *the* crucial noncognitive predictor (Dumfart & Neubauer, 2016), pupils' school wellbeing is

related to more diverse facets of their personality, which also call for consideration. A recent study (Evans, Martin, & Ivcevic, 2018) also examined this relationship, and suggested that students' personality traits may influence their subjective experience of school by favoring qualitatively different strategies for coping with school's stressful demands. Our analyses further suggest that the relationship between personality and outcome variables may take different forms, both linear and nonlinear. The fact that curvilinear links emerged in our data could encourage researchers in the field to lend more attention to the possibility of nonlinear relationships between personality and outcome variables, and calls for theoretical process models that can account for threshold effects.

Finally, the most practical implication of the present study is that school practitioners may consider children's assessments of their personality alongside those of adults. Our data point to the possibility that self-ratings have incremental validity over those of external informants. As already mentioned, this last result calls for additional research designs able to address common-method variance issues and to incorporate control variables, but it suggests that the process of gathering information conceivably could be enriched by multiple sources of data. As Bollich, Johannet, and Vazire (2011) argued, "the point is not to claim that one perspective is more accurate than the other overall, but to establish that each perspective has some knowledge that the other does not" (p. 3). These authors envisaged the conditions under which feedback on personality from trusted and credible sources (e.g., teachers or school psychologists in a school context) could help to refine self-knowledge and compensate for the blind spots of subjective self-perception. Feedback is only beneficial if recipients are ready to process the information. We contend that the introspective exercise of completing self-report personality questionnaires could be the first step toward refining self-knowledge, relating it to adults' perceptions and expectations, and being able to modify reactions that might otherwise hinder school adjustment.

This presupposes the design of assessment instruments that (i) are suited to children's levels of understanding, and (ii) exhibit more satisfying psychometric qualities. For example, when Measelle, John, Ablow, Cowan, and Cowan (2005) administered the Berkeley Puppet Interview, which features contrasting statements that elicit children's self-perceptions, they found that respondents as young as 5 years could provide coherent descriptions of themselves in terms of the Big Five. More recently, Mackiewicz and Ciecuch (2016) suggested that studies among primary school children could use questionnaires featuring drawings, in order to illustrate the different social situations characterizing the Big Five dimensions in a less abstract way. An instrument that was specifically designed for children, rather than being derived from questionnaires for adults, could yield a more consistent picture of the way children view their functioning. We hope that, by further documenting the possible respective merits of children's and others' perspectives, the present study will encourage further research efforts in this direction.

Declarations of interest: none

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors

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