

## **Child personality measures as contemporaneous and longitudinal predictors of social behaviour in pre-school**

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**Abstract:** Predictive relations from personality measures to children's social behaviour in pre-school were examined for 3 year old children (at Time 1; T1) who were reassessed one year later (at Time 2; T2). At both times, mothers and fathers separately rated children's personality characteristics using the *Inventory of Child Individual Differences* (Halverson et al., 2003), while the pre-school teachers assessed the same children on the *Social Competence and Behavior Evaluation Scale* (LaFreniere et al., 2001). Three general predictive models were examined, contemporaneous (at T1 and T2), longitudinal, and cumulative. Mother- and father-rated child personality was contemporaneously predictive of children's social behaviour as assessed by their pre-school teachers. The most consistent predictions across the spouses and at both times of measurement were obtained for child externalizing behaviour. More disagreeable and emotionally stable children, as opposed to their less disagreeable and more instable counterparts, were concurrently observed to exhibit more externalizing tendencies during the time spent in pre-school. Maternal reports were longitudinally predictive of children's social competence and internalizing behaviour and the father reports predicted internalizing and externalizing behaviour one year later. Neuroticism at age 3 was consistently linked to internalizing tendencies at age 4 across parents both longitudinally and cumulatively. Father-rated Disagreeableness at age 3 was predictive of externalizing behaviour one year later in both longitudinal and cumulative models, while the contemporaneous information on child Disagreeableness and Neuroticism (reversed) at T2, independent of the respective child traits at T1, significantly improved the cumulative predictions of externalizing behaviour from maternal reports. In general, child personality scores derived from maternal data sets were more powerful predictors of children's social behaviour across the models than those obtained from paternal reports. Contemporaneous relations were stronger than longitudinal ones, predictions of social competence were relatively the weakest and the longitudinal links between child personality and later internalizing tendencies were somewhat stronger than were the associations between personality and children's externalizing tendencies at age 4.

**Key words:** personality, childhood development, The Inventory of Individual Differences, multiple-informant approach, social behaviour, pre-school children

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## Mere otrokove osebnosti kot sočasni in vzdolžni prediktorji socialnega vedenja v vrtcu

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**Povzetek:** V pričujoči študiji sva pri triletnih otrocih (v času 1; Č1) preučevali napovedno moč njihovih osebnostnih značilnosti na socialno vedenje v vrtcu. Isti ciljni otroci so v raziskavi sodelovali še leto dni kasneje (v času 2; Č2). Ob obeh časih merjenja so mame in očetje neodvisno ocenili otrokove osebnostne značilnosti s pomočjo Vprašalnika individualnih razlik med otroki (Halverson in dr., 2003). Vzgojiteljice so iste otroke ocenile na Vprašalniku socialnega vedenja (LaFreniere in dr., 2001). Z zbranimi podatki sva preverjali tri splošne napovedne modele, sočasnega (v Č1 in Č2), vzdolžnega in kumulativnega. Mamine in očetove ocene otrokove osebnosti so sočasno napovedovale socialno vedenje otrok kot so ga zaznale vzgojiteljice v vrtcu. Najbolj dosledne napovedne zveze, tj. z ocen obih staršev in ob obeh časih merjenja, sva ugotovili med otrokovimi osebnostnimi značilnostmi in vedenjem pozunanjenja. Pri bolj nesprejemljivih in čustveno stabilnih otrocih so vzgojiteljice zaznale več tendenc k pozunanjenju kot pri njihovih manj nesprejemljivih in stabilnih vrstnikih, vsaj v času, ki so ga otroci preživeli v vrtcu. Mamine ocene otrokovih osebnostnih značilnosti so vzdolžno napovedovale otrokovo socialno kompetentnost in vedenje ponotranjenja, očetove ocene pa so po preteku leta dni napovedovale otrokovo vedenje ponotranjenja in pozunanjenja. Nevroticizem pri starosti treh let, kot sta ga pri otrocih ocenila oba starša ločeno, je dosledno napovedoval vedenje ponotranjenja pri štiriletnikih, in sicer vzdolžno ter kumulativno. Očetove ocene otrokove nesprejemljivosti pri starosti treh let so vzdolžno in kumulativno napovedovale otrokovo vedenje pozunanjenja leto dni kasneje. Pri napovedi z maminih ocen 3-letnikove osebnosti pa so sočasne informacije o otrokovi nesprejemljivosti in nevroticizmu (negativne povezave) v Č2, ki so bile neodvisne od istih značilnosti v Č1, pomembno izboljšale kumulativno napoved vedenja pozunanjenja. Na splošno so imele mamine ocene otrokove osebnosti višjo napovedno moč kot očetove, sočasne napovedi na otrokovo socialno vedenje pa so bile višje kot vzdolžne. Ocene otrokovih osebnostnih značilnosti so razmeroma najnižje napovedovale njegovo socialno kompetentnost v vrtcu, razmeroma najmočnejše vzdolžne povezave pa sva ugotovili med osebnostjo in otrokovim kasnejšim vedenjem ponotranjenja, ki so bile nekoliko višje kot napovedne zveze med osebnostjo in otrokovimi tendencami k pozunanjenju.

**Ključne besede:** osebnost, razvoj otroka, Vprašalnik individualnih razlik med otroki, pristop več ocenjevalcev, socialno vedenje, predšolski otroci

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Based on a free descriptive approach, new instruments reflecting observable individual differences in children that are most salient for their parents were developed, i.e. the *Hierarchical Personality Inventory for Children* (HIPiC; Mervielde & De Fruyt, 1999) and the *Inventory of Child Individual Differences* (ICID; Halverson et al., 2003). Regardless of the approach or instrument being used in investigating individual differences, a firm basis was provided to assert that even young children have personality traits, markers for the general Five-Factor Model (FFM; e.g. Digman & Shmelyov, 1996; Halverson et al., 2003; Lamb, Chuang, Wessels, Broberg & Hwang, 2002; Mervielde, Buyst & De Fruyt, 1995; Mervielde & De Fruyt, 1999,

2002; Zupančič & Kavčič, 2003, 2004a). Relatively few empirical studies investigated which child temperament/personality characteristics are involved in developmental outcomes and to what extent these characteristics affect child development. Reports on the effects of child characteristics measured by instruments consistent with the comprehensive FFM in children are also lacking (Prinzle et al., 2004). In their search for convergent validity of the new FFM child measures, the investigators have concurrently assessed the relations between child personality and different adaptive/maladaptive behaviours (e.g. De Fruyt, Mervielde & van Leuween, 2002; Halverson et al., 2003; Zupančič & Kavčič, 2004a, b). Few of the studies contemporaneously explored unique contributions of child personality to behavioural adjustment/problems (Prinzle et al., 2004; Slobodskaya, 2004; Zupančič, Podlessek & Kavčič, under review). In addition to the investigations of contemporaneous effects of personality on social behaviour, the current study extended these attempts and examined longitudinal contributions of early child personality measures to later developmental outcomes.

Past research employing the FFM measures in relation to child adjustment/maladjustment was mostly performed with heterogeneous age groups of children (De Fruyt et al., 2002; Halverson et al., 2003; Slobodskaya, 2004), school-age children (Ehrler, Evans & McGhee, 1999; Lamb et al., 2002; Prinzle et al., 2004) and, exceptionally, with age homogenous groups of pre-school children (e.g. Zupančič & Kavčič, 2003, 2004a, c). Findings of these studies generally demonstrated that Neuroticism is linked to internalizing behaviour, Disagreeableness and Extraversion are associated with externalizing behaviour, Conscientiousness and Openness are negatively related to any problem behaviour, while Extraversion, Conscientiousness, Openness, Emotional Stability (Neuroticism reversed) and Agreeableness share common variance with social adjustment.

The authors who explored the effects of children's characteristics on concurrent and later developmental outcomes have predominantly focused on specific temperament characteristics (e.g. Belsky, Friedman & Hsieh, 2001; Caspi & Sylvania, 1995; Eisenberg et al., 1995; Eisenberg et al., 1997; Eisenberg et al., 2001; Fabes et al., 1999; Rothbart & Bates, 1998) which are viewed as an early substrate for personality development (e.g. Ahadi & Rothbart, 1994; Caspi & Sylvania, 1995; Graziano, Jensen-Campbell & Sullivan-Logan, 1998). Early childhood temperamental measures were consistently found to predict social functioning, both contemporaneously as well as longitudinally (e.g. Eisenberg et al., 1997, 2001). High levels of negative emotionality and low attentional persistence are associated with low levels of social competence in toddlers (Belsky et al., 2001). Pre-school children who are dispositionally inclined to negative emotionality (anxious, angry, irritable), react negatively and intensively to things and people around them, and are unable to regulate well their attention, evince especially limited social skills and are more disliked by age mates than those who are less prone to experience and express negative emotion, and who at the same time exhibit higher attentional and behavioural control (Eisenberg et al., 1995). Early

unmanageability was found to be linked to later externalizing problems (Rothbart & Bates, 1998) and so were the negative emotionality and low regulation of attention, emotion and behaviour (Eisenberg et al., 2000). Early temperamental fearfulness and behavioural inhibition is linked to development of behaviours of an internalizing nature (Coplan & Rubin, 1998). Four- to eight year old children with internalizing problems are more prone to sadness, low attention regulation, and low impulsivity (Eisenberg et al., 2001).

To extend the findings of temperamental research in relation to early childhood developmental outcomes, the present study aimed at investigating the predictive value of a newly developed FFM assessment tool (the ICID) with a sample of 3 year old target children, the earliest age at which this new instrument can be applied. Rather than mid-level trait scores, four-dimensional ICID measures were taken as predictors, i.e. Extraversion, Conscientiousness, Disagreeableness, and Neuroticism (Zupančič & Kavčič, 2004a). Moreover, we also examined whether contemporaneous and longitudinal effects of these robust components on teacher-rated child social behaviour in pre-school were similar for the mother and the father provided information on child personality. Three predictive models were examined: (a) contemporaneous, testing for the effects of child personality as observed by the parents on his/her concurrent social behaviour in pre-school (at the age 3 and 4 years separately); (b) longitudinal, exploring the predictive relations between child personality at age 3 and social behaviour at age 4; and (c) cumulative, proposing that the child's behavioural performance at age 4 reflects the combined effect of his/her personality at ages 3 and 4. Because the four ICID components are relatively stable from the age of 3 to 4 years (Zupančič, Sočan & Kavčič, under review), child personality scores were controlled for this stability, i.e. only the information on personality at age 4 that was independent of the personality information at age 3, was taken into analysis.

## Method

### Participants

Mothers, fathers and pre-school teachers of children, attending 17 pre-school institutions in different regions of the country were first involved in the study when the pre-schoolers were 3 years old (from 31 to 46 months;  $M = 37.9$  months,  $SD = 2.5$  months). Mothers and fathers reported on personality characteristics of 314 (154 boys and 161 girls) and 297 (142 boys and 153 girls) children, respectively. One year later, 293 and 282 children were rated by the mothers and fathers, respectively. 268 and 256 of the children were assessed at both times of the study by the mothers and fathers, respectively. The parents completed from 8 to 22 years of schooling ( $M_{\text{mothers}} = 12.8$  years and  $M_{\text{fathers}} = 12.3$  years). At both times of the study, the target children were also evaluated by their pre-school teachers. Social behaviour of 80% percent of

the children was rated by the same teacher at both times of measurement, and at both times, 52 pre-school teachers participated as informants. Each of them reported on 1 up to 13 children. All of the target children who were reassessed by the three adult informants remained in the same pre-schools at the second time of measurement.

## Instruments

The *Inventory of Child Individual Differences* (ICID; Halverson et al., 2003; Slovenian version, Zupančič and Kavčič, 2004a) was used as a measure of child personality. This instrument includes 108 items, which are rated on a 7-point scale (1 – *the characteristic is present in my child much less than in the average child or not at all*; 4 – *...to the same extent as in the average child*; 7 – *... much more than in the average child*). The items form 15 robust mid-level scales that showed high internal reliability and validity in both the original and the adapted version, high mother–father and moderate parent–pre-school teacher agreement, high one month test–retest stabilities (see Halverson et al., 2003, for data on the original version; see Zupančič and Kavčič, 2004a, for data on the adapted version), and moderate to high one-year stabilities across different informants (Zupančič, Sočan & Kavčič, under review). Maternal and paternal perceptions of 3-year-olds resulted in a four component structure: Extraversion (defined by Activity Level, Compliant, Considerate, Intelligence, Openness to Experience, Positive Emotionality, and Sociability mid-level scales), Conscientiousness (Achievement, Distractibility - reversed, and Organized), Neuroticism (Fearful/Insecure and Shy), and Disagreeableness (Antagonism, Negative Emotionality, and Strong Will) (Zupančič & Kavčič, 2004a). These four components were strongly congruent across the parents and over a one-year time period (Zupančič, Sočan & Kavčič, under review). The internal reliabilities of the broad-band dimensions at child age of 3 years ranged from 0.79 to 0.91 and from 0.79 to 0.92 for maternal and paternal reports, respectively (Zupančič, Podlesek & Kavčič, under review).  $\alpha$  remained within the same range one year later, when the target children were 4 years old, and the one-year temporal stability of the four components was estimated from 0.58 to 0.67 and from 0.52 to 0.62 for maternal and paternal assessments, respectively (Zupančič, Sočan & Kavčič, under review).

Pre-school teachers rated children's social behaviour on the Slovenian version of *Social Competence and Behavior Evaluation – Pre-school Edition* (SV-O; LaFreniere, Dumas, Zupančič, Gril and Kavčič, 2001), an adapted and standardized version of the original SCBE (LaFreniere and Dumas, 1995). This assessment tool consists of 80 items describing the child emotional expression and social behaviour towards peers and adults in a pre-school setting. The items are rated along a 6-point scale (1 – *the behaviour almost never occurs*; 6 – *it almost always occurs*). They combine into eight basic and four summary scales tapping the child's adaptive and maladaptive behaviour. Three summary scales were used in the present study, i.e.

Social Competence (indicating joyful, trustful, tolerant, integrated, calm, prosocial, cooperative, and autonomous behaviour), Internalizing Problems (reflecting depressed, anxious, isolated, and dependent behaviour), and Externalizing Problems (describing angry, aggressive, egotistical, and oppositional behaviour). The internal consistency of these scales in terms of  $\alpha$  was estimated from 0.85 to 0.95; the retest reliability coefficients were between 0.74 and 0.89; and the agreements between primary teacher and secondary teacher ratings ranged from 0.69 to 0.89 (LaFreniere et al., 2001).

## **Procedure**

Pre-school teachers were given SV-O questionnaires to assess each child in their group, for whom parents gave a written consent to participate in the study. The teachers were also given short instructions on how to rate children's social behaviour and were asked to distribute the envelopes containing two copies of ICID questionnaires (one marked as a mother and the other as a father form) to children's parents. The parents filled-in the questionnaires at their homes and returned them to their child's pre-school teacher in sealed envelopes. All of the questionnaires were collected from the pre-school institutions approximately two weeks later. This procedure was repeated one year later with the same target children and the three adult informants.

## **Results**

Means and standard deviations for the teacher assessments of children's social behaviour in pre-school and the dimensional measures of child personality derived from maternal and paternal reports at both times of the study are presented in Table 1.

Correlations between measures of parent-rated (mother and father separately) Extraversion, Conscientiousness, Disagreeableness and Neuroticism, and teacher-reported social competence, internalizing and externalizing behaviour in pre-school are presented in Table 2 for both contemporaneous (at T1 and at T2) and longitudinal data (from T1 to T2). The pattern of obtained coefficients shows somewhat higher correlations between children's social behaviour and their personality characteristics as assessed by their mothers than those provided by their fathers. Generally, high Extraversion and Conscientiousness, and low Disagreeableness and Neuroticism were related to children's social competence as well as to low levels of internalizing behaviour in pre-school. Furthermore, externalizing tendencies were mainly associated with Disagreeableness.

The relative contributions of parent-perceived child personality on teachers' concurrent and T2 judgements of the child behaviour in pre-school were explored by multiple regression analyses. First, teachers' SV-O summary scores (Social Compe-

Table 1: Means and standard deviations of child personality measures and social behaviour at time 1 and time 2.

Variable	Mother-rated				Father-rated			
	M		SD		M		SD	
	T1	T2	T1	T2	T1	T2	T1	T2
<b>Personality<sup>a</sup></b>								
Extraversion	4.9	5.0	0.6	0.6	5.0	5.0	0.6	0.6
Conscientiousness	4.6	4.6	0.6	0.6	4.5	4.6	0.6	0.6
Disagreeableness	3.7	3.7	0.7	0.7	3.7	3.7	0.7	0.6
Neuroticism	3.3	3.4	0.7	0.7	3.4	3.4	0.7	0.7
	Teacher-rated							
	T1	T2	T1	T2				
<b>Social Behaviour</b>								
Social Competence <sup>b</sup>	108.1	118.4	31.7	28.5				
Internalizing Behaviour <sup>c</sup>	73.8	78.6	15.8	13.2				
Externalizing Behaviour <sup>c</sup>	75.7	77.4	16.1	14.6				

Notes.

<sup>a</sup> Scores from 1 to 7 possible.

<sup>b</sup> Scores from 0 to 200 possible.

<sup>c</sup> Scores from 0 to 100 possible (reversed scoring).

Table 2: Contemporaneous and longitudinal correlations between measures of child personality, and social behaviour in pre-school (two-tailed tests).

Child Personality	Social Behaviour					
	Social Competence		Internalizing Behaviour <sup>a</sup>		Externalizing Behaviour <sup>a</sup>	
	T1	T2	T1	T2	T1	T2
Mother-rated at T1:						
Extraversion	29**	18**	28**	19**	02	-04
Conscientiousness	24**	16**	26**	16**	17**	08
Disagreeableness	-10*	-11*	-11*	-05	-26**	-17**
Neuroticism	-23**	-21**	-33**	-27**	06	03
Father-rated at T1:						
Extraversion	23**	09	28**	16**	-02	-07
Conscientiousness	20**	06	21**	09	10	02
Disagreeableness	-12*	-03	-09	-03	-28**	-15**
Neuroticism	-17**	-05	-28**	-18**	-01	05
Mother-rated at T2:						
Extraversion		22**		24**		-04
Conscientiousness		23**		21**		04
Disagreeableness		-19**		-15**		-22**
Neuroticism		-27**		-33**		07
Father-rated at T2:						
Extraversion		10*		15**		-11*
Conscientiousness		09		06		00
Disagreeableness		-11*		02		-14**
Neuroticism		-16**		-17**		10*

Notes. Decimals omitted.

\*  $p < 0.05$ ; \*\*  $p < 0.01$ .

<sup>a</sup> reversed scoring.

tence, Internalizing and Externalizing Behaviour) were regressed on the fathers' and the mothers' ICID dimensional scores of child personality at both times of measurement concurrently. The contemporaneous predictive relations are presented in Table 3 and Table 4 for the data collected at T1 and T2, respectively. In order to test the longitudinal and cumulative predictive models, a two-step multiple regression analyses were performed for both maternal and paternal data sets separately. The teacher SV-O scores at the child's age of 4 years (T2) were used as criteria variables. In the first step, T1 child personality scores were included as predictors to reveal longitudinal predictive relations. The T2 information on child personality which was independent of the respective child personality information at T1 (the so-called residuals) was entered in the second step (see Table 5) to provide information on cumulative effects of personality on social behaviour. These residuals were computed in a separate set of regression analyses from T1 child personality dimensions to T2 child personality scores (as they represent parts of T2 scores that remain unexplained by T1 scores). The residuals were entered in the cumulative models instead of child T2 scores because temporal stabilities of the four ICID personality dimensions were relatively high across the parents (see the *Instrument* section).

### **Contemporaneous predictions of child social behaviour**

All of the predictive relations were significant, but relatively small in size, except for the associations between mother ratings of child Neuroticism and child internalizing behaviour as observed in pre-school that shared 13% of the common variance. According to Cohen's (1988) recommendations, the squared  $R$ s below 0.13 are estimated to be small, those between 0.13 and 0.25 are interpreted as medium in size, while the values of 0.26 and larger are considered as large. All of the predictions from paternal assessments of child personality to the children's social behaviour in pre-school were consistently weaker compared to the predictions from maternal reports on their children.

Parental perceptions (maternal and paternal) of 3-year-olds as extraverted contemporaneously predicted teacher assessments of the same children as socially competent in pre-school. Parent-rated child emotional stability (Neuroticism reversed) and father-rated Extraversion were linked to low levels of internalizing behaviour in pre-school, while the parental (maternal and paternal alike) assessments of child Disagreeableness and mother-reported Neuroticism were predictive of externalizing behaviour as observed by the pre-school teachers. Less disagreeable and more emotionally stable (mother report only) children exhibited less externalizing tendencies in pre-school.

One year later, when the same target children were 4 years old, the power of mother-rated child personality to contemporaneously predict child social behaviour in pre-school remained almost the same, while the predictions from paternal reports

Table 3: Regression models predicting teacher reports on social behaviour at T1.

Child Personality	T1 Social Competence	T1 Internalizing Behaviour <sup>a</sup>	T1 Externalizing Behaviour <sup>a</sup>
Mother-rated at T1	$\square R^2=.09$ $Adj.R^2=.08$ = .20*	$\square R^2=.13$ $Adj.R^2=.12$ /	$\square R^2=.11$ $Adj.R^2=.10$ /
Extraversion	/	/	/
Conscientiousness	/	/	/
Disagreeableness	/	/	= -.27**
Neuroticism	/	= -.25**	= .23**
F for equation	F = 7.55**	F = 10.97**	F = 9.14**
Father-rated at T1	$\square R^2=.06$ $Adj.R^2=.05$ = .19*	$\square R^2=.10$ $Adj.R^2=.09$ = .19*	$\square R^2=.09$ $Adj.R^2=.08$ /
Extraversion	/	/	/
Conscientiousness	/	/	/
Disagreeableness	/	/	= -.32**
Neuroticism	/	= -.20**	/
F for equation	F = 4.68**	F = 8.03**	F = 6.85**

Notes. Degrees of freedom for maternal ratings:  $df_1=4$ ,  $df_2=299$ ; for paternal ratings:  $df_1=4$ ,  $df_2=291$ .  
/ = beta coefficient non-significant.

\*  $p < .05$ ; \*\*  $p < .01$ .

<sup>a</sup> reversed scoring.

Table 4: Regression models predicting teacher reports on social behaviour at T2.

Child Personality	T2 Social Competence	T2 Internalizing Behaviour <sup>a</sup>	T2 Externalizing Behaviour <sup>a</sup>
Mother-rated at T2	$\square R^2=.09$ $Adj.R^2=.07$ /	$\square R^2=.11$ $Adj.R^2=.10$ /	$\square R^2=.10$ $Adj.R^2=.09$ /
Extraversion	/	/	/
Conscientiousness	/	/	/
Disagreeableness	/	/	= -.39**
Neuroticism	= -.17*	= -.29**	= .27**
F for equation	F = 6.79**	F = 9.08**	F = 7.78**
Father-rated at T2	/	$\square R^2=.05$ $Adj.R^2=.03$ /	$\square R^2=.06$ $Adj.R^2=.04$ /
Extraversion	/	/	/
Conscientiousness	/	/	/
Disagreeableness	/	/	= -.21**
Neuroticism	/	= -.20*	= .18*
F for equation	F = 2.12	F = 3.41**	F = 4.00**

Notes. Degrees of freedom for maternal ratings:  $df_1=4$ ,  $df_2=288$ ; for paternal ratings:  $df_1=4$ ,  $df_2=277$ . / = beta coefficient non-significant.

\*  $p < .05$ ; \*\*  $p < .01$ .

<sup>a</sup> reversed scoring.

decreased. The predictive relations between child personality measures and social competence in pre-school changed somewhat from T1 to T2. Parent perceived child Extraversion was no longer linked to socially competent behaviour and the paternal reports on child personality did not predict children's social competence any more. When considering the maternal ratings, low child Neuroticism was demonstrated a significant predictor of 4-year-olds' social competence in pre-school. On the other hand, teacher-rated child internalizing and externalizing behaviour were consistently, across the spouses, predicted by parental reports on child Neuroticism and Disagreeableness. The children who were viewed more emotionally unstable (higher on Neuroticism) by their parents were ascribed more internalizing tendencies by the pre-school teachers in comparison to their more emotionally stable peers, whereas those who were rated higher on Neuroticism were also less prone to externalizing as opposed to their less instable counterparts. Furthermore, the 4-year-olds who scored higher on Disagreeableness were observed to show less externalizing tendencies in pre-school than were their age mates perceived by the parents as less disagreeable.

### **Longitudinal and cumulative predictions of child social behaviour**

Maternal reports on child personality at age 3 longitudinally predicted 4 year old children's social competence and internalizing behaviour in pre-school as observed by the teachers. Paternal reports were longitudinally predictive of children's internalizing and externalizing tendencies. Except for the cumulative prediction of child internalizing behaviour that was based on the maternal data set, the predictive power of parental reports on child personality was small in its magnitude.

Mother-rated child Neuroticism was significantly linked to social competence. The 3-year-olds' perceived to be emotionally more stable were, in comparison to the more instable children, attributed more socially competent behaviour in pre-school one year later. The longitudinal prediction of social competence as derived from maternal reports on child personality was not significantly improved when the residuals of child personality from T1 to T2 were entered to the predictive model in the second step (the cumulative model).

Longitudinal predictions from child personality to internalizing behaviour were significant across the parents with Neuroticism predicting children's internalizing behaviour in pre-school. The 3-year-olds who were observed more emotionally instable by the parents were evaluated to be more prone to internalizing behaviour in pre-school one year later. However, the predictions from maternal reports were stronger than from paternal ones. Adding the residuals of mother-rated child personality from T1 to T2 into the model significantly improved the predictions, but Neuroticism as assessed at the child's age 3 remained the single significant predictor of T2 internalizing behaviour. On the other hand, the information on child personality provided by the fathers at T2 and independent of their child personality information given at T1

Table 5: Regression models predicting teacher reports on social behaviour at T2 longitudinally and cumulatively.

Child Personality	T2 Social Competence		T2 Internalizing Behaviour <sup>a</sup>		T2 Externalizing Behaviour <sup>a</sup>	
	Long. m.	Cumul. m.	Long. m.	Cumul. m.	Long. m.	Cumul. m.
Mother-rated						
	$\square R^2=.06$ <i>Adj.R^2=.04</i>	$\square R^2=.03$ <i>Adj.R^2=.06</i>	$\square R^2=.10$ <i>Adj.R^2=.08</i>	$\square R^2=.04$ <i>Adj.R^2=.11</i>	$\square R^2=.03$ <i>Adj.R^2=.02</i>	$\square R^2=.07$ <i>Adj.R^2=.08</i>
E T1	/	/	/	/	/	/
E <sub>resid.</sub> <sup>b</sup>		/		/		/
C T1	/	/	/	/	/	/
C <sub>resid.</sub> <sup>b</sup>	/	/		/		/
DisA T1	/	/	/	/	= -.15*	= -.19**
DisA <sub>resid.</sub> <sup>b</sup>	/	/		/		= -.31**
N T1	= -.16*	= -.16*	= -.28**	= -.27**	/	/
N <sub>resid.</sub> <sup>b</sup>	/	/		/		= .21**
F change	<i>F=3.90**</i>	<i>F=2.10</i>	<i>F=6.88**</i>	<i>F=2.93*</i>	<i>F=2.32</i>	<i>F=5.03**</i>
Father-rated						
	$\square R^2=.01$ <i>Adj.R^2=-.01</i>	$\square R^2=.03$ <i>Adj.R^2=.01</i>	$\square R^2=.04$ <i>Adj.R^2=.03</i>	$\square R^2=.02$ <i>Adj.R^2=.03</i>	$\square R^2=.04$ <i>Adj.R^2=.03</i>	$\square R^2=.03$ <i>Adj.R^2=.04</i>
E T1	/	/	/	/	/	/
E <sub>resid.</sub> <sup>b</sup>		/		/		/
C T1	/	/	/	/	/	/
C <sub>resid.</sub> <sup>b</sup>		/		/		/
DisA T1	/	/	/	/	= -.19*	= -.20*
DisA <sub>resid.</sub> <sup>b</sup>		/		/		/
N T1	/	/	= -.17*	= -.18*	/	/
N <sub>resid.</sub> <sup>b</sup>		/		/		/
F change	<i>F=0.37</i>	<i>F=2.03</i>	<i>F=2.76*</i>	<i>F=1.23</i>	<i>F=2.67*</i>	<i>F=2.18</i>

Notes. Long. m. = data for the longitudinal model; Cumul. m. = data for cumulative model; E = Extraversion; C = Conscientiousness; DisA = Disagreeableness; N = Neuroticism. <sub>resid.</sub> represents information on a respective personality component at T2 which is independent of the information on the same component at T1. Degrees of freedom for maternal ratings:  $df_1=4$  and  $df_2=263$  in the longitudinal model,  $df_1=4$  and  $df_2=259$  in the cumulative model; for paternal ratings:  $df_1=4$  and  $df_2=251$  in the longitudinal model,  $df_1=4$  and  $df_2=247$  in the cumulative model. / = beta coefficient non-significant.

\*  $p < .05$ ; \*\*  $p < .01$ .

<sup>a</sup> reversed scoring.

<sup>b</sup> the residuals were entered only into the cumulative models.

(the residual) did not significantly improve the longitudinal prediction of internalizing behaviour. Hence, the father-rated Neuroticism at T1 remained the only significant single predictor of children's internalizing tendencies in the cumulative model.

Maternal reports on child personality at T1 did not significantly predict externalizing behaviour one year later. When the residuals of personality measures at T2 were entered into the cumulative model, the prediction of externalizing tendencies was significantly improved. Child Disagreeableness at age 3 and its residual at T2 as well as the residual of Neuroticism at T2 were significant predictors of 4-year-olds' externalizing behaviour in pre-school. More disagreeable and less emotionally unstable children were more prone to exhibit externalizing tendencies. Furthermore, child Disagreeableness as derived from paternal reports at T1 was predictive of child externalizing behaviour longitudinally. The 3-year-olds who were rated to be more disagreeable by their fathers were viewed by the teachers as more prone to externalizing one year later than the children who were assessed to be less disagreeable. However, when the residuals of father-rated child personality measures at T2 were entered into the cumulative model, the predictive power of the longitudinal model was not significantly improved. Early child (age 3 years) Disagreeableness remained the only significant predictor of his/her externalizing behaviour at age 4.

## Discussion

The purpose of this inquiry was to examine the predictive relations between parental assessments of child personality and pre-school teacher reports on child social behaviour. Three models, the contemporaneous, the longitudinal, and the cumulative, were tested against the empirical data collected within two waves of measurement, when the target children were 3 and 4 years old. The results suggest that early child personality characteristics as perceived by the parents within the family context and assessed through a newly developed measure, the *Inventory of Child Individual Differences* (Halverson et al., 2003), have the power to predict, both contemporaneously and longitudinally, children's social behaviour in a different context and rated by different informants, i.e. pre-school teachers. Generally, the significant predictive associations appeared in the directions that could be expected from the findings of other authors reporting on older children and using different measures of personality and social behaviour (e.g. De Fruyt et al., 2002; Lamb et al., 2002; Prinzie et al., 2004; Slobodskaya, 2004; Zupančič & Kavčič, 2003).

The major finding of our study was that as early as at age 3, the robust components of child personality differentially contributed unique variance to the prediction of social behaviour concurrently, at both times of measurement, and even longitudinally, one year later. Across the parents and over the three models, Neuroticism predicted internalizing and Disagreeableness was predictive of child externalizing behaviour in pre-school. The children who were observed as fearful/insecure (easily

upset, distressed, lacking in confidence, afraid of lots of things) and shy (socially reticent, withdrawn, quiet) within the home context, were more likely to appear to their pre-school teachers somewhat more depressed, anxious, relatively isolated from their age mates in the pre-school group and somewhat more dependent on the adults (primary and secondary teacher) in comparison to their less emotionally unstable peers. The children described as more antagonistic (confrontational, discourteous, rude, aggressive), prone to negative affect (irritable, moody, getting angry easily, quick tempered) and strong willed (bossy, self-assertive, manipulative) by their parents were perceived to behave more aggressively and egotistically in interpersonal relations with other children, and to display more oppositional behaviour towards the adults in pre-school settings than were the children considered as less disagreeable at home. It seems that some of the robust child personality characteristics as observed by the parents are expressive through specific social behaviours in pre-school. In other words, there is some cross-contextual consistency of child behaviour. The relative presence or absence of maladaptive behaviours (i.e. internalizing and externalizing tendencies) can be reliably, though relatively modestly, predicted from children's broad-band traits already at the beginning of early childhood (age 3 years).

Moreover, the obtained predictions of internalizing/externalizing behaviour from early child personality were also demonstrated significant longitudinally, over a one-year time period. Given that the robust child personality traits are relatively stable already in early childhood (Zupančič, Sočan & Kavčič, under review), these longitudinal predictions may be, at least partly due to the temporal consistency of child personality. On the other hand, the effects of early personality on later behaviour can be carried through the stability of specific behaviours. Taking into consideration a moderate level of temporal stability of adaptive/maladaptive behaviours in pre-school (e.g. La Freniere et al., 2001; Zupančič & Kavčič, 2004b), the effect of early Neuroticism on later internalizing tendencies (or that of Disagreeableness on externalizing) could be, for example, mediated through concurrent internalizing (and externalizing, respectively) behaviour that has an effect on the respective behaviour in children's later development.

The predictions of children's social competence in pre-school were not as consistent across the parents and over time as were the links between child personality and less adaptive social (internalizing/externalizing) behaviour. At age 3, the children who were perceived more extraverted within the home context (by their mothers and fathers) were concurrently assessed to show more socially competent behaviour during their stay in pre-school. One year later, father reports were not contemporaneously related to children's competent behaviour (neither were the father ratings predictive of child subsequent social competence, longitudinally and cumulatively), while mother reports on 4-year-olds' Neuroticism were inversely associated with their concurrent social competence. More emotionally stable children were more likely to exhibit competent behaviour in the pre-school context. Mother reports on child personality were also predictive of children's competence longitudinally. Spe-

cifically, low Neuroticism at age 3 significantly predicted social competence at age 4. It appears likely that, in addition to Neuroticism, more specific traits than the robust personality components are involved in the explanation of children's socially competent behaviour, e.g. empathy, consideration of others, helpfulness, social initiative (Mostow, Izard, Fine & Trentacosta, 2002) or temperamental traits such as effortful control, positive emotionality, low impulsivity (Fabes et al., 1999). Some of these lower level traits, however, are tapped by the broad-band constructs such as Extraversion (e.g. positive emotionality), Neuroticism (e.g. shyness reversed) and Conscientiousness (e.g. effortful control). On the other hand, temperamental research revealed that the effects of temperamental traits are more frequently moderated when social competence and not problem behaviour is considered as a criterion variable. High levels of negative emotionality in toddlers were, for example, associated with low levels of social competence at age 3 years only when attentional persistence was poor (Belsky et al., 2001); pre-school children inclined to negative emotionality (anxiety, anger, irritability) and intense reactions evince lower social skills only when they are unable to regulate their attention (Eisenberg et al., 1995).

Another finding from the present study was that the early information on child personality (age 3 years) can be, with respect to specific social behaviours, also moderated by the informant providing the report on the personality of the same child. That is, mother information on child personality was significant in predicting later social competence, but it did not reliably contribute to the explanation of child externalizing behaviour one year later. The opposite was demonstrated for father ratings of early child personality. It seems that mothers might be more sensitive in detecting early child characteristics involved in children's later developing social skills than fathers, who in turn, may be more accurate in perception of early child traits that contribute to later externalizing tendencies. Furthermore, the residual personality measures based on maternal assessments at T2 significantly added to the explained variance of social behaviour at T2, above the variance that was already explained by personality measures provided at T1. Concurrent mother-provided information on 4-year-olds which is not carried through the temporal stability of her perceptions of child personality (from age 3 to 4) significantly improves the predictions of child internalizing and externalizing behaviour in pre-school at age 4. But, it was not also the case when the paternal ratings were entered into the cumulative model. With paternal data sets the cumulative models either failed to reach the significance (child social competence) or the improvements of the longitudinal predictions were non-significant (child internalizing and externalizing behaviour). Even though the fathers' reports are as reliable (internally and temporally) as are the mothers' (Zupančič & Kavčič, 2004a; Zupančič, Podlesek & Kavčič, under review; Zupančič, Sočan & Kavčič, under review) and the father provided information on children can be more predictive in specific cases (i.e. longitudinal links to child externalizing behaviour) than the maternal judgements, the mother reports on child personality were overall somewhat more predictive of the children's social behaviour in pre-school.

## Conclusion

In sum, assessments of the broad-band child personality components as derived from different informants differentially predicted children's contemporaneous adaptive and "maladaptive" behaviour in pre-school and their social behaviour in the same context one year later. The longitudinal predictive model, proposing that parental judgements on early child personality have the power to predict later behavioural outcomes, was consistently supported (across different caretakers) with respect to the links of Neuroticism to internalizing behaviour. Few differences existed in the predictions from maternal and paternal ratings. Data for adaptive social behaviour fit the longitudinal model only when maternal reports on children were considered, while the father reports on early child Disagreeableness suggested significant links with later externalizing tendencies. With paternal data sets, only longitudinal and contemporaneous models of explaining internalizing/externalizing behaviour consistently fit the empirical data. It was also the case when the prediction of child social competence was based on maternal child personality reports. On the other hand, the mother-provided data on child personality was more supportive of the cumulative over the longitudinal predictive models when the child internalizing/externalizing behavioural dimensions were addressed.

The present analyses provided some valuable evidence on predictive validity of early child personality measures, presumably the precursors of the Big Five. However, the results are limited to the sample of children attending pre-schools and they are solely relied on the questionnaire measures. One of the strengths of the study is that it controlled for shared method variance because the child personality ratings and reports on their social behaviour were derived from different informants. Further investigation is needed to examine whether the effect of early child personality characteristics on social behaviour is preserved across development, preferably by the inclusion of a multi-method measurement strategy. There are many other important questions yet to be answered, e.g. do the contemporaneous effects remain stable or do they increase/decrease through later years; to what extent does early parent-rated child personality presents a risk factor for later developmental outcomes; are the effects of early child personality characteristics moderated by characteristic socialization styles.

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