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Pathways of behavioural and emotional symptoms in kindergarten children: What is the role of pro-social behaviour?

Accepted: 5 September 2006
Published online: 5 December 2006

The study was conducted at the Department of Child and Adolescent Psychiatry, University of Basel (Switzerland). The study was supported by the Swiss National Science Foundation (grant 32-66778.01), 'Freie Akademische Gesellschaft Basel' and 'Novartis-Stiftung'.

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■ **Abstract** The study investigated the predictive value of pro-social behaviour for developmental pathways of behavioural and emotional problems at kindergarten age. One hundred and sixty children participated in the study at the ages of 5 and 6. Teachers and parents completed the Strengths and Difficulties Questionnaire; children completed the Berkeley Puppet Interview at both assessment points. Single-informant data were aggregated to enhance the reliability and validity of data. Gender and parental educational status were controlled.

Symptoms (conduct problems, hyperactivity and emotional symptoms) and pro-social behaviour were moderately stable over time. Compared to girls, boys showed higher levels and increases of conduct problems and hyperactivity and lower levels of pro-social behaviour. Lower parental educational level was associated with higher levels and increases in hyperactivity. Although pro-social behaviour was cross-sectionally associated with behavioural and emotional symptoms, pro-social behaviour did not predict changes

in conduct problems or hyperactivity over time. However, children with above average emotional symptoms and above average pro-social behaviour at Age_5 showed the highest level of emotional symptoms at Age_6. The results indicate that low levels of pro-social behaviour are associated with children's externalising behaviour problems, but that for children with high levels of emotional symptoms, higher levels of pro-social behaviour should also be considered as a risk factor.

In sum, our results suggest mainly homotypic pathways of internalising and externalising symptoms across kindergarten age, but indicate that the assessment of pro-social behaviour yields additional information regarding the developmental pathways of emotional symptoms.

■ **Key words** kindergarten age – behavioural/emotional symptoms – pro-social behaviour – multi-informant data

Introduction

Although there is a rich research tradition regarding the development of pro-social behaviour [1], the role of pro-social behaviour—i.e. behaviours intended to benefit others—for the development of psychopathology has only received limited attention. It has been suggested that both high and low levels of pro-social behaviour may place children at risk for psychopathology [1, 2]. Low levels of pro-social behaviour are associated with externalising problems in early and middle childhood [3–6]. In contrast, cross-sectional and longitudinal studies have found that children who are overly concerned for the welfare of others, are highly cooperative or show over-friendliness, have elevated levels of emotional symptoms [5, 7, 8]. These latter results suggest that children who show high levels of pro-social behaviour have an increased risk of emotional problems.

The current paper investigates whether pro-social behaviour in the first kindergarten year is predictive of the developmental pathways of behavioural and emotional symptoms. Specifically, we hypothesise that low levels of pro-social behaviour place children at risk for behavioural symptoms (conduct problems and hyperactivity), while high levels of pro-social behaviour place children at risk for later emotional symptoms. To enhance the reliability and validity of the measures, a multi-informant approach (including child, teacher and parent report) has been used [9].

Method

■ Participants

One hundred and sixty-eight children participated in the study in their first and second kindergarten year. Most children were recruited through their kindergarten classes ($N = 96$, participation rate = 74%). Kindergarten classes were selected from different city districts representing various socio-economic and ethnic backgrounds representative of the City of Basel [10]. An additional 72 children are part of our longitudinal study on family relationships (original $N = 80$) that began when the mothers of these children were pregnant [11]. Children who had at least two out of three informant reports (child, parent or teacher) at both time points were included in the current paper ($N = 160$; 92 boys and 68 girls). Mean age at the first assessment was 5.19 years ($SD = 0.54$) and at the second assessment 6.17 years ($SD = 0.55$).

■ Instruments

Teacher and parent questionnaire

Parents and teachers completed the Strengths and Difficulties Questionnaire [12] at the first and second assessment. Each scale (*emotional symptoms*, *conduct problems*, *hyperactivity/inattention* and *pro-social behaviour*) consists of five items that are rated on a three-point-scale (not true, somewhat true, certainly true). Internal consistency was moderate to high (conduct problems: average Cronbach's $\alpha = .66$; hyperactivity: $\alpha = .80$; emotional symptoms: $\alpha = .71$; prosocial behaviour: $\alpha = .71$).

Child interview

All children were interviewed individually in a separate room in their kindergarten or at home by a trained psychologist at both assessments. The Berkeley Puppet Interview [13] is carried out by means of two identical hand puppets that make two opposing statements on a topic (e.g. 'I don't cry a lot' and 'I cry a lot'); then the child can give his/her own statement. The interview is videotaped and afterwards scored by independent raters (average ICC = .97). To link child reports with adult reports we aggregated the original BPI-subcales. The scale *emotional symptoms* encompasses depression, separation anxiety and over-anxiousness (20 items, average Cronbach's $\alpha = .73$). The scale *conduct problems* encompasses opposition/defiance and overt aggression to peers (13 items, $\alpha = .70$). The scale *hyperactivity/impulsivity* includes impulsivity plus a single item on inattention (7 items, $\alpha = .52$). The scale *pro-social behaviour* includes 7 items ($\alpha = .66$).

Aggregating multi-informant data

Previous analyses of the cross-sectional data showed that principal component analyses of the multi-informant reports of symptoms yielded a main factor of symptoms on which all informants give important information [10]. Thus the aggregation of child, parent and teacher reports yields reliable and valid information on children's symptoms.

To combine child, parent and teacher reports, single informant data were first z-standardised over both time points. To ensure factorial invariance over time and to include data from children with incomplete data sets, single-informant scores were averaged across informants (mean scores). Multi-informant scores were computed when the data from at least two informants was available.

Table 1 Bivariate associations between symptoms and pro-social behaviour (Pearson correlations)

	Age 5			Age 6			
	2. Hyp	3. Emo	4. Pros	5. Con	6. Hyp	7. Emo	8. Pros
<i>Age 5</i>							
1. Conduct problems	.570**	.353**	-.406**	.592**	.402**	.182*	-.336**
2. Hyperactivity		.450**	-.176*	.410**	.699**	.266**	-.248**
3. Emotional symptoms			-.215**	.199*	.298**	.557**	-.108
4. Pro-social behaviour				-.317**	-.159*	-.056	.601**
<i>Age 6</i>							
5. Conduct problems					.423**	.194*	-.480**
6. Hyperactivity						.270**	-.307**
7. Emotional symptoms							-.078
8. Pro-social behaviour							

Note: ** $P < .01$, * $P < .05$ (two-sided tests)

Results

■ Stability and change of symptoms and pro-social behaviour

Symptoms and pro-social behaviour showed moderate to high stability from the ages of 5–6 (see Table 1). The General Linear Model (GLM) analyses with repeated measures showed that the average level of symptoms did not change over time. The average level of pro-social behaviour increased from Age_5 to Age_6, $F(1,154) = 15.85$, $P < .001$ ($M_{T1} = -0.09$; $M_{T2} = 0.10$).

■ Effects of child gender and parental educational level

The repeated measures analyses yielded significant main effects for gender. Compared to girls, boys showed higher levels of conduct problems, $F(1,154) = 8.78$, $P = .004$ ($M_{boys} = 0.14$, $M_{girls} = -0.18$). The significant interaction effect Time \times Gender, $F(1,154) = 5.15$, $P = .025$, also showed that boys had an increase and girls a decrease of conduct problems from Age_5 to Age_6 (Boys: $M_{Age5} = 0.11$, $M_{Age6} = 0.17$; Girls: $M_{Age5} = -0.11$, $M_{Age6} = -0.25$). Moreover, boys showed higher levels of hyperactivity $F(1,154) = 9.97$, $P = .002$ ($M_{boys} = 0.13$, $M_{girls} = -0.19$) and lower levels of pro-social behaviour, $F(1,154) = 22.91$, $P < .001$ ($M_{boys} = -0.19$, $M_{girls} = 0.27$).

Parental educational level had a significant main effect on hyperactivity, $F(1,154) = 6.39$, $P = .002$. The post-hoc Test (Scheffé) showed that children from highly educated families (both parents with university degrees) showed lower levels of hyperactivity than those from lower educated families (both parents only a vocational degree or less); $P = .001$; $M_{low} = 0.29$, $M_{middle} = 0.01$; $M_{high} = -0.19$.

■ Linear associations between symptoms and pro-social behaviour

Bivariate associations (Pearson) between symptoms were highest for conduct problems and hyperactivity, and lowest for conduct problems and emotional symptoms (see Table 1). Pro-social behaviour was significantly negatively associated with conduct problems and hyperactivity. Pro-social behaviour was negatively associated with emotional symptoms at Age_5, but not at Age_6.

Next, we computed multiple regression analyses with symptoms at Age_6 as dependent variables. All symptom groups and pro-social behaviour (continuous measures) at Age_5 served as independent variables. As we controlled for the matching symptom levels at Age_5, the additional variables predict intra-individual changes from Age_5 to Age_6 [14]. To control for potential confounding effects we also included child gender and parental educational level in the analyses. Results are shown in Table 2.

Conduct problems at Age_6 were significantly predicted by conduct problems at Age_5, but not by other symptoms or pro-social behaviour. Moreover, being male predicted increases in conduct problems. Likewise, hyperactivity at Age_6 was predicted by

Table 2 Results of the linear regression analyses predicting symptoms at age 6

	Symptoms at age_6		
	Conduct problems	Hyperactivity	Emotional symptoms
<i>Age_5 measures</i>			
Conduct problems	.500 (<.001)	-.035 (.620)	-.034 (.703)
Hyperactivity	.085 (.309)	.667 (.000)	.064 (.475)
Emotional symptoms	-.032 (.662)	-.048 (.453)	.530 (<.001)
Pro-social behaviour	-.056 (.448)	-.083 (.193)	.010 (.897)
Child gender (1 = male)	.189 (.007)	.150 (.013)	-.011 (.886)
Parental education	-.033 (.605)	-.168 (.003)	-.089 (.192)
R^2	.404 (<.001)	.554 (<.001)	.323 (<.001)

Note: Cells show standardized B-values, P -values in brackets

Table 3 Results of the categorical GLM-analyses with interaction effects

	Symptoms at Age_6		
	Conduct problems	Hyperactivity	Emotional symptoms
<i>Age_5 measures</i>			
Symptoms	31.2 (<.001)	70.3 (<.001)	52.5 (<.001)
Pro-social behaviour	1.34 (.249)	0.76 (.384)	0.20 (.656)
Symptoms × Pro-social	0.58 (.447)	0.94 (.335)	5.74 (.018)
Child gender (1 = male)	8.87 (.003)	8.88 (.003)	0.31 (.576)
Parental education	0.69 (.503)	8.86 (<.001)	2.06 (.131)
R^2	0.278 (<.001)	0.456 (<.001)	0.291 (<.001)

Note: Cells show F-values, *P*-values in brackets (df = 1,153)

hyperactivity at Age 5 and child gender. Moreover, parental educational level predicted changes in hyperactivity, the lower the educational status, the higher increases in hyperactivity from Age_5 to Age_6. Emotional symptoms at Age_6 were only predicted by emotional symptoms at Age_5.

■ Multivariate longitudinal associations with interaction effects

To analyse the interaction effect of pro-social behaviour with symptoms, we computed three GLM-analyses. First, levels of symptoms and pro-social behaviour were categorised into two groups: *low* levels (below average; <0) and *high* levels (above average; >0). In the analyses we entered the categorised variables and the corresponding interaction effects. Regarding symptoms, we only entered the matching symptom level at Age_5. Test statistics are reported in Table 3.

The results concerning conduct problems and hyperactivity remained the same as reported above in the linear regression analyses. Main and interaction effects of pro-social behaviour were not significant.

However, emotional symptoms at Age_6 were predicted by emotional symptoms at Age_5 and by the interaction term Emotional symptoms × Pro-social behaviour. As can be seen in Fig. 1, children with above average levels of emotional symptoms and above average levels of pro-social behaviour at Age_5 showed the highest levels of emotional symptoms at Age_6. In contrast, children with low levels of emotional symptoms and high levels of pro-social behaviour at Age_5 had the lowest levels of emotional symptoms at Age_6.

Discussion

Our results suggest mainly homotypic pathways of internalising and externalising symptoms across kin-

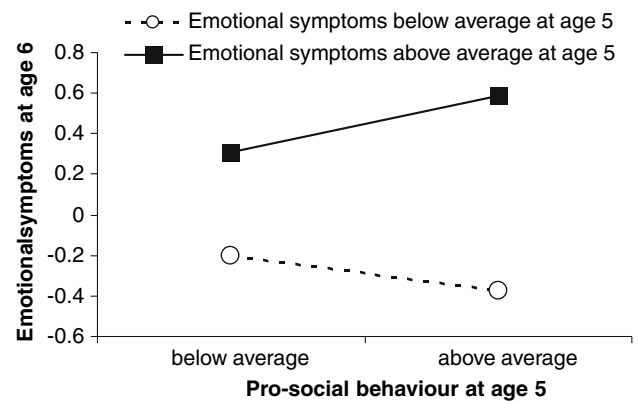


Fig. 1 Emotional symptoms at the age of 6, predicted by emotional symptoms and pro-social behaviour at the age of 5

dergarten age, but indicate that the assessment of pro-social behaviour yields additional information regarding the developmental pathways of emotional symptoms.

■ Developmental pathways of symptoms in kindergarten age

Behavioural and emotional symptoms remained relatively stable over time. Conduct problems, hyperactivity and emotional symptoms were significantly cross-sectionally and longitudinally associated. Nevertheless, non-corresponding symptoms did not predict changes in symptoms from Age_5 to Age_6, when the matching symptom at the first assessment was controlled. These results suggest homotypic pathways of symptoms [15] from the first to the second kindergarten year.

Gender not only predicted levels of symptoms (e.g. boys showing more conduct problems, hyperactivity and less pro-social behaviour) but also changes in symptoms over time. For boys, conduct problems increased from the first to the second kindergarten year, whereas in girls it decreased. This latter finding might be explained by gender-differentiated socialization effects [16, 17]. In boys aggressive-disruptive behaviour is gender-normative and might thus be encouraged by peers and teachers in kindergarten, whereas in girls gender-atypical overt aggressive behaviour might be discouraged and pro-social behaviour encouraged.

Parental educational level—a measure of socioeconomic status—predicted level and changes in hyperactivity. In line with other studies [18], children from lower educated families showed higher levels of hyperactivity. Moreover, their hyperactive/impulsive behaviour further increased from Age_5 to Age_6. This result might be explained by the accentuation

principle [15]. That means that experiences in a new context, i.e. the kindergarten, seem to accentuate the hyperactivity problems of low-income children.

■ Pro-social behaviour as risk factor

In contrast to the average level of symptoms, which remained stable over time, pro-social behaviour did increase between the ages of 5 and 6.

In accordance with other studies [3–6], the bivariate analyses showed that conduct problems and hyperactivity were negatively associated with pro-social behaviour. However, pro-social behaviour did not have an additional predictive value regarding the development of externalising problems. Therefore, pro-social behaviour does not seem to be a causal (overlapping) risk factor for externalising symptoms, but should merely be considered as a correlate [19].

The associations between pro-social behaviour and emotional symptoms are more complex. The level of emotional symptoms moderated the impact of pro-social behaviour on later emotional symptoms. Our findings suggest that for children with low levels of emotional symptoms at the age of 5, pro-social behaviour is negatively associated with later emotional symptoms, whereas for those with high levels of emotional symptoms, pro-social behaviour is positively associated with later emotional symptoms. Maybe these highly pro-social children have an empathic over-arousal which increases their own depressive and anxious feelings [20]. These children might also be too considerate of the needs of others and neglect their own feelings and needs. It might also be that these emotionally disturbed but highly pro-social children are very compliant, cooperative and cannot set limits to others and are thus at risk for peer

abuse or victimization [21], which may in turn increase their symptoms.

This result is in part in line with previous research which indicated that children who are highly cooperative [5] or show overfriendliness [7] are at risk for the development of depressive symptoms. Although there is only a partial overlap between concepts and measures used in the different studies, the results point in the same direction. Further studies should investigate the processes which are involved in this phenomenon.

■ Conclusion

In child psychiatry, there has been a growing interest in developing strength-based approaches. This indicates that improving children's strengths (in addition to reducing symptoms) can be viewed as a desired service delivery outcome [22]. However, our study showed that we need a differentiated view of the role of pro-social behaviour. Although generally positively evaluated, pro-social behaviour—i.e. showing behaviours that benefit others—seems not to be positive for all children. For children with externalising symptoms, increasing pro-social behaviour might be a treatment goal, whereas for children with internalising symptoms, strengthening the children to be considerate of their own needs and feelings seems to be more important.

Although pro-social behaviour is only a specific subcategory of social competence in general, its inclusion in psychiatric assessments might be a first step towards the integration of competences and psychopathology in an integrated comprehensive developmental view [23].

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