



Research Paper

Understanding associations between early social-emotional screening status and primary school children's social-emotional well-being in Finland

Päivi M.E. Pihlaja^{a,*}, Piia-Kaisa Åminne^b, Alice S. Carter^c, Nina Sajaniemi^a

^a University of Eastern Finland, Joensuu Campus, Yliopistokatu 2, FI-80100 Joensuu, Finland, P.O. Box 111, FI-80101 Joensuu, Finland

^b University of Turku, Department of Education, Assistentinkatu 5, 20014 University of Turku, Finland

^c Department of Psychology, University of Massachusetts Boston, 100 Morrissey Boulevard, Boston, MA 02125, United States

ARTICLE INFO

Keywords:

social
early childhood
BITSEA
SDQ
longitudinal study
social, emotional and behavioral problems

ABSTRACT

The present study examined associations between social, emotional, and behavior (SEB) problems in toddlerhood and social and emotional strengths and difficulties at eight years of age. In addition, we were interested in associations between parental worry about the child's psychosocial and language development in toddlerhood and social and emotional strengths and difficulties at age eight years. Participants were 554 children (52.7% boys) and their parents, involved in a longitudinal study with annual assessments. Parents rated children's social-emotional competence at eighteen months, using the Brief Infant-Toddler Social and Emotional Assessment (BITSEA), and again at eight years, using the Strengths and Difficulties Questionnaire (SDQ). Parental age, education, socio-economic status and income were applied as control variables. Sex effects were also investigated. Early SEB problems predict some, but not all, aspects of later SE development. While competence delay was associated with less prosocial behavior, SEB problems predicted only hyperactivity and conduct problems, not later peer problems or emotional symptoms. Parental worry, especially about child language development, was an important indicator of later SEB problems. Based on our study results, actions and interventions aiming to support children's SE development throughout childhood should take into consideration its differentiated form and associations. Furthermore, parental worry about children's language development should not be ignored when diagnosing SEB problems and competence delays.

1. Introduction

Many studies focus on children's social, emotional and behavior (SEB) problems at school age. Toddlers' challenges have been studied less often and the study of toddler SEB problems largely emerged in the early 2000s (e.g., Carter et al., 2004; Briggs-Gowan & Carter, 2006; Hauser-Cram & Woodman, 2016; Mäntymaa et al., 2012; Weitzman et al., 2011). SEB problems are often divided into three categories: externalising, internalising and dysregulation problems. All children engage in these kinds of behaviors as a part of their typical psychosocial development; however, such behavior becomes problematic if it occurs too often, too intensely or too pervasively in a toddler's actions (Briggs-Gowan et al., 2006; Carter et al., 2003). Toddlers externalising problems include aggressive behavior, peer aggression or impulsivity. Internalising problems in early development can manifest as social withdrawal, sadness, worry, fears, nervousness and distress in separation situations. Dysregulation includes the presence of elevated negative

emotionality or challenges with emotion regulation, problems with eating or sleeping, and sensory sensitivities (see Briggs-Gowan & Carter, 2006). These signs of SEB problems can change as children become older. For example, there may be a greater emphasis on somatic symptoms (e.g., headache) along with unhappiness and fears. With school-aged children, externalised problems refer to aggressive behavior and conduct problems (Goodman, 1997, 1999).

Studies reporting prevalence rates of unfavourable social-emotional development in children younger than two years are scarce and vary in applied methods. Prevalence rates reported by parents have ranged from approximately four to 33 percent (Baillargeon et al., 2011; Beermink et al., 2007; Briggs-Gowan et al., 2001; Mathiesen & Sanson, 2000; Möricke et al., 2013; Mäntymaa et al., 2012). This great variation in the prevalence of children's social-emotional difficulties may be due to several potential biases that influence parental responses; e.g. some may underreport their children's SE difficulties to present themselves and their children in a more favourable light (social desirability bias; for

* Corresponding author.

E-mail addresses: paivi.pihlaja@uef.fi (P.M.E. Pihlaja), nina.sajaniemi@uef.fi (N. Sajaniemi).

<https://doi.org/10.1016/j.ecresq.2024.11.013>

Received 12 February 2024; Received in revised form 18 November 2024; Accepted 29 November 2024

Available online 5 December 2024

0885-2006/© 2024 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

example, see [Nederhof, 1985](#)), some parents may be in denial about their children's difficulties due to fear of what it means for their child's future or their own parenting. Parents' level of awareness and knowledge about SE difficulties also vary and their own characteristics, beliefs and expectations may affect on their perceptions ([Kroes et al., 2006](#); [Najman et al., 2001](#)). Further, cultural background can influence how parents perceive and report social-emotional difficulties. Some cultures may view certain behaviors as less problematic or may attribute higher stigma to reporting difficulties ([Runge & Soellner, 2022](#)). Similarly, based on the Copenhagen Child Cohort 2000 study, reported by public health nurses, the frequencies of SEB problems among 18-month-old children varied between 16–18 percent ([Skovgaard et al., 2007](#)). Despite the large variation in reported SEB problems among toddlers and young children, the estimated prevalence for children under the age of three years ranges from 10 - 20 percent (see [Brauner & Stephens, 2006](#); [Briggs-Gowan et al., 2001](#)).

Previous studies have recognised that a child's sex contributes to trajectories of SEB problems. When significant sex differences have been found in the earlier BITSEA studies, girls have had higher competence scores than boys, whereas problem scores have been higher for boys than for girls ([Alakortes et al., 2015](#); see also [Kruizinga et al., 2012](#)). Also, many studies have found boys to be more often aggressive and to have more conflictual interactions than girls ([Dodge et al., 2006](#); [Miner & Clarke-Stewart, 2008](#); [Keane & Calkins, 2004](#); [Rubin et al., 2003](#); [Wichström et al., 2012](#)). These differences emerge very early in development, as shown by [Baillargeon et al. \(2007\)](#) and [Rubin et al. \(2003\)](#); boys aged two and four years exhibited significantly more conflict and aggressive behaviors than girls of the same age. Even though many studies have documented sex differences in SEB problems, some studies found no evidence of differences between boys and girls (e.g., [Hay et al., 2000](#); [Baillargeon et al., 2011](#); [Briggs-Gowan et al., 2001](#), [Skovgaard et al., 2007](#)). In a study with 12-month-old infants, there were no significant differences in SEB problems, but girls were rated as having higher social-emotional competence than boys ([Alakortes et al., 2017](#)).

[Rescorla et al. \(2011\)](#) observed substantial consistency in mean CBCL scores across numerous societies, despite significant variation in factors such as geography and ethnicity. The Finnish Mean Total Problems scores were comparable to those from the U.S., Belgium, the Netherlands, and France. While [Rescorla et al.](#) acknowledged some cultural differences between countries, their findings strongly supported the cross-cultural consistency of CBCL scales across 24 diverse societies. Similarly, [Javo, Heyerdahl, and Rønning \(2000\)](#) found comparable results but noted that the effect of ethnicity differed between boys and girls. [Rescorla et al. \(2011\)](#) further highlighted that there was greater variance within societies than between them.

1.1. Stability in social-emotional and behavioral problems

Many longitudinal studies have demonstrated the stability of SEB problems ([Briggs-Gowan et al., 2006](#); [Mäntymaa et al., 2012](#); [Pihlakoski et al., 2006](#); [van Zeijl et al., 2006](#)). Children who exhibited more physical aggression compared to their peers at the age of two years showed these kinds of problems also during preschool and in elementary school at eleven years of age ([Coté et al., 2006](#); [Mesman & Koot, 2001](#)). Furthermore, delays or differences in language, neuro-cognitive or motor development during the first year of life predicts impaired neuro-cognitive functioning and compromised communicative and social abilities detected at the age of one and a half years. Unwanted pregnancy and parents' negative expectations of the child recorded in the first months of the child's life are also significant predictors of relationship disturbances at one and a half years ([Skovgaard et al., 2008](#)). Over and above stability within these developmental domains, early childhood SEB problems place children at risk for several other problems later in life ([Briggs-Gowan & Carter, 2008](#); [Mesman & Koot, 2001](#)). Therefore, it is crucial to recognise the signs of non-optimal development as early as possible to reduce the likelihood of

cumulative SEB problems later in life.

Despite the extensive number of studies documenting the persistence of SEB problems in childhood and youth, there is limited research on how SEB problems may influence development over time and how the different aspects of SEB problems and competence delay both separately and mutually affect child development. In a Finnish study ([Mäntymaa et al., 2012](#)), externalising problems were found to be especially persistent. Both externalising and internalising problems at two years of age were associated with externalising problems at five years of age. In another study by [Jacobsen et al. \(2020\)](#), externalising problems at the age of two and three predicted persistence in externalizing problems at the age of eight. However, internalised problems identified at two and three years of age were only weakly associated with later externalising or internalising problems. The Dutch longitudinal study by [Mörické et al. \(2014\)](#) found that infants (14–15 months) with negative and demanding behavior showed more improvement in their social and emotional behavior measured at the age of three than children with communication and interaction problems. Thus, negative and demanding behavior seemed more transient, while communication and interaction problems showed greater stability.

1.2. Correlates of social-emotional and behavioral problems

Many factors affect children's psychosocial development ([Calkins et al., 1998](#); [Kochanska et al., 2009](#)). Influences include both strengths and threats to optimal development. Factors contributing to SEB problems and also to delays in competence relate to individual (e.g., sex, temperament, being born extremely early) and environmental factors (quality of the neighbourhood, early childhood education, parental education, socioeconomic status, parent-child interaction). By two years of age, children born very preterm (<30 weeks' gestation or weighing <1 250 gram at birth) were found to be at higher risk for elevated internalising and dysregulation problems, and lower competence, when compared to peers born at term ([Spittle et al., 2009](#)). [Steele and colleagues \(2015\)](#) identified several indicators of social disadvantages associated with emotional and behavioral problems in children aged four to seven years. In their study, the strongest predictor of SEB problems was economic vulnerability in the family, which is consistent with a large body of research supporting the impacts of poverty on child behavior and development ([Hosokawa & Katsura, 2018](#); [Qi & Kaiser, 2003](#)). [Qi and Kaiser \(2003\)](#) provided an extensive overview of empirical literature based on 30 studies examining preschool behavioral problems. Their analysis revealed that numerous risk factors are associated with these issues among children from low-income families. Key factors included parental stress, harsh disciplinary practices, maternal depression, and limited social support, all of which were strongly linked to the prevalence of behavioral problems. [Hosokawa and Katsura \(2018\)](#) highlighted the relationship between maternal and paternal educational levels and children's emotional and behavioral problems. Similarly, a low maternal educational level has been found to be associated with an increase in emotional symptoms and behavioral problems among four- to six-year-old children ([Grazuleviciene et al., 2017](#)). Low levels of parental education also were associated with social and emotional problems in a study by [Hjern and colleagues \(2021\)](#). They also found that young parental age predicted these problems. In addition, family structure (i.e., a reconstituted family or a family with no biological parents) and parental education (low education) were associated with SEB problems ([Steele et al., 2015](#)).

The role of parents in identifying possible problems has received limited attention in Finnish research as well as in a range of clinical services. [Ellingson and colleagues \(2004\)](#) emphasise the important role of parental worry in identifying possible problems in the child. In a general population sample of 12-month-old Finnish infants, parents seldom reported any social-emotional or behavioral worry about the child assessed as having SEB. With young children of primary school age children, parental worry showed a significant and positive relation to

SEB problems (Li & Zhou, 2021). Weitzman et al. (2011) demonstrated that mothers' worry about their children's behavior, emotions or relationships was significantly associated with social-emotional problems or the risk of these problems.

Studies concerning SEB in very young children have been focused on incidence or prevalence (e.g., Baillargeon et al., 2011; Beernink et al., 2007; Briggs-Gowan et al., 2001; Mäntymaa et al., 2012; Möricke et al., 2013), gender differences (Alakortes et al., 2015; Baillargeon et al., 2011) and the contribution of social economic factors to social, emotional and behavioral problems (e.g.; Li & Zhou, 2021; Steele et al., 2015).

1.3. The importance of this study (Lack of research)

Measurement, early identification and intervention regarding SEB problems and delays in competence at a young age is important to create the possibility of altering developmental pathways through interventions that reduce problems and increase competencies (Kruizinga et al., 2015). Without early intervention, young children's social and emotional problems might persist or worsen, which makes early detection, professional evaluation and family assessment very important. Effective interventions can only be planned following effective assessment (Briggs-Gowan & Carter, 2008; Briggs-Gowan & Carter, 2006).

In Finland, limited data are available concerning how infant-toddler SEB problems and competence delays affect later social and emotional development. Also, international studies concerning the stability and development of SEB problems are scarce. Previous studies examining the predictive power of early detection of SEB problems and parental worry on a child's later social-emotional development have mainly applied either independent or multiple regression models explaining composite scores for general school-age social-emotional/behavioral problems (e.g., Briggs-Gowan & Carter, 2008) and other outcomes, such as motor development (Kovaniemi et al., 2018). However, to our knowledge, this is the first Finnish study that applies structural equation modelling to analyse the effects of early SEB problems and competence delays on different subscales of later social-emotional development. In doing so, we also add to the debate on the internal structure of the SDQ measurement instrument (see e.g., Carneiro et al., 2023; Koskelainen et al., 2000; Obel et al., 2015; Ortuño-Sierra et al., 2015) suggesting different hypothetical dimensions of the SDQ ranging from the original five-factor models (Goodman, 1997; van de Looij-Jansen et al., 2011) to three-factor models (Dickey & Blumberg, 2004; van de Looij-Jansen et al., 2011) and second-order-factor models (Goodman et al., 2010).

Although there is a large amount of evidence concerning sex differences in SE competencies, less is known about possible sex differences in these associations and about how early SEB problems and competence delays are related to later SEB development. In Finland, differences in literary competencies between boys and girls in Pisa (2018) are the biggest relative to other OECD countries, which is concerning news as regards SEB problems in boys, as these are connected to learning difficulties (especially attention problems). If there are differences between sexes in early childhood, it would be important to consider whether early interventions that are implemented in early education could minimise the persistence and growth of these differences.

1.4. Aims and hypotheses

Given the gap in the current research knowledge, we examined associations between social-emotional and behavioral problems in toddlerhood and social emotional strengths and problems/difficulties at the age of eight years. Our aim was 1) to investigate how parental BITSEA screening status for the a) problem and b) competence scales (no concern vs of-concern) predict the later subscales of the Strengths and Difficulties Questionnaire (SDQ) and 2) to examine the role of sex, parental worry and background variables in explaining SE development. In doing so, we analysed the internal structure of the SDQ to test the

distinctiveness of the hypothesised scale dimensions in the study population.

In line with the literature reviewed, we hypothesised that toddlers with a screening status in the of-concern ranges of the BITSEA problem and competence scores at 18 months would score higher on the SDQ difficulties subscale and lower on the SDQ strengths subscale than their peers with no-concern scores in the BITSEA. We hypothesised that sex would predict SEB problems at the age of eight and also that low family SES variables explain SEB problems.

2. Method

2.1. Participants and procedure

This study was a part of a multidisciplinary longitudinal research programme, Steps to the Healthy Development and Well-being of Children (the STEPS Study). All mothers who delivered a living child between January 2008 and April 2010 in the the South-Western Finland formed the cohort population of 9,811 mothers and 9,936 children. Of this cohort, 1,827 children with families volunteered as participants for the intensive follow-up group (sub-cohort). Among the children, 52.1% were boys. The data for the present study was collected using a detailed questionnaire completed by mothers and/or spouses at the study recruitment point and when the children were 18 (± 2) months ($n=961$, 52% boys) and 8 years ($n=560$, 53% boys). The number of parents that had completed the survey at all time points included in the present study resulted in a sample of 554 children (52.7% boys; $M_{age} = 17.23$, $SD_{age} = 0.82$), which corresponds to a response rate of 57.7% between the surveys. The design and study procedures were approved by the Ministry of Social Affairs and Health and the Ethics Committee of the Hospital District of Southwest Finland (27 February 2007). The study participants were informed of the purposes of the study and that participation was completely voluntary. The description of the scientific data file is formulated according to the standards given by the Office of the Data Protection Ombudsman. The data are stored under lock and key in computers at the Institute of Clinical Medicine, University of Turku (see also Lagström et al., 2013).

2.2. Data attrition

The present study experienced high rates of attrition owing to dropout between the data collection when children were 18 months (T1 hereafter) and when they were eight years (T2 hereafter). To avoid attrition bias in the study results, we examined whether the study participants differed systematically from those lost to follow-up (non-participants hereafter) in terms of background characteristics or the 18-month children's social and emotional development (i.e., the BITSEA score). From previous studies with this cohort, we know that participating families in the STEPS study differ from the whole cohort population with regard to family background. Compared to non-participants, participating mothers were, on average, seven months older than those in the whole cohort population and more likely to be parenting a first-born child, married, living in an urban area and of a somewhat higher occupational status (see Lagström et al., 2013). Comparing families from the follow-up (T2) to those who dropped out following T1 completion, the mothers of the participating families were a little less than one year older (31.5 yrs. vs. 30.8 yrs.) and more likely to have at least a tertiary degree in education (68.3% vs 62.1%). No differences were found between the dropouts and participants at T2 regarding independent variables (Table 1).

3. Measures

3.1. Independent measures

The Finnish version of the Brief Infant–Toddler Social and Emotional

Table 1
Comparison of the characteristics of the dropouts and study participants.

Variables	Dropouts ^a	T2 ^b	<i>p</i>
<i>Independent variables: SE development</i>			
BITSEA ^c Problem total, mean (SD)	8.15(4.92)	8.27(4.81)	.697
BITSEA Competence total, mean (SD)	17.19 (2.61)	17.47 (2.69)	.097
BITSEA Cut Problem, %	16.2	15.4	.737
BITSEA Cut Competence, %	7.7	6.6	.552
Parental worry, %	10.5	9.4	.589
<i>Control variables: Sociodemographics</i>			
Child			
Sex: boy, %	51.8	52.3	.858
Apgar score (5 min), mean (SD)	9.00(0.87)	9.03(0.84)	.658
Mother			
Age in years, mean (SD)	30.81 (4.38)	31.48 (4.37)	.018
Occupation: at least professional, % ^d	64.2	67.6	.307
Education: at least tertiary degree, % ^e	62.1	68.3	.047
Father			
Age in years, mean (SD)	32.95 (5.09)	33.34 (5.43)	.259
Occupation: at least professional, % ^d	58.3	62.0	.307
Education: at least tertiary degree, % ^e	49.9	49.2	.842
Family			
Income at least €3,000/month, %	47.4	46.3	.737

^a (n=393–397)

^b (n=595–596)

^c BITSEA = Brief Infant–Toddler Social and Emotional Assessment

^d Classification: professionals (in senior positions, e.g., managerial, but also in intermediate positions, such as nurses) vs others [blue-collar workers (in industry or agriculture) and service workers (e.g., clerical and sales)]

^e Classification: tertiary degree (high educational level, e.g., university, but also polytechnic) vs others (school or community level and persons with no vocational education).

Assessment (BITSEA; Briggs-Gowan et al., 2004; Haapsamo et al., 2009) was used to measure children's social-emotional development. The BITSEA consists of 42 items assessing both problems and competencies. BITSEA/P items address problems in internalising (eight items, e.g., the child seems very unhappy, sad, depressed or withdrawn), externalising (six items, e.g., the child is restless and cannot sit still) and regulatory domains (eight items, e.g., the child has trouble adjusting to changes), as well as rare behaviors that may be indicative of autism spectrum disorders or other psychopathology (14 red flag items, e.g., the child purposely hurts him/herself). BITSEA/C items address delays and deficits in the acquisition of social-emotional competencies (e.g., the child follows rules). Both scales have demonstrated acceptable psychometric properties within Finnish contexts also (Alakortes et al., 2015, 2017; Haapsamo et al., 2009; Kovaniemi et al., 2018). The Problem scale is comprised of 31 items and the Competence scale of 11 items. The response format for each item involves three options: “not true/rarely” (0), “sometimes true/sometimes” (1) and “very true/often” (2). In addition, two items include another option, N for No opportunity. Higher total scores on BITSEA/P (range 0–62) indicate a higher level of behavioral and emotional problems and lower total scores on BITSEA/C (range 0–22) indicate a lower level of competence. BITSEA total scores are associated with specific percentile rankings and cut scores aggregated by sex and age determine the of-concern and no-concern groups (Briggs-Gowan & Carter, 2006). Due to the lack of standardised Finnish cut score values for the BITSEA, USA standardised scores were applied (cf. Alakortes et al., 2015); the cut score for children aged 16–17 months competence total score is ≤ 12 (for both sexes) and problem total score ≥ 13 (for both sexes). For children aged 18–20 months, competence total score is ≤ 14 (for both sexes) and problem total score ≥ 15 (for boys) or ≥ 13 (for girls). Hence, total problem scores above the cut-off value indicate possible SEB problems, and total competence scores below the

cut-off value indicate delays or deficits in social-emotional competencies.

In addition to problem and competence items, the BITSEA includes two questions addressing parental worry about their child's (1) psychosocial development (“How worried are you about your child's behavior, social development and emotional development?”) and (2) language development (“How worried are you about your child's language development?”). Parents rated their level of worry on a 4-point scale (from 1 = not at all worried to 4 = very worried). We applied these measures to examine the role of parental worry in both recognising social-emotional problems and competence delays at 18 months and in predicting later social-emotional development at eight years.

3.2. Dependent measures

Children's social-emotional wellbeing at the age of eight years was assessed by means of parental ratings using the Strengths and Difficulties Questionnaire (SDQ; Goodman, 2001). The SDQ is a widely used child mental health questionnaire with originally five hypothesised subscales, which has displayed high validity as a screening instrument for detecting children at risk for mental health problems and for evaluating children's psychological strengths, both in Finland and elsewhere (e.g., Borg et al., 2014; Goodman et al., 2000; Goodman, 2001; Koskelainen, 2008; Koskelainen et al., 2000). The SDQ consists of 25 items rated on a 3-point scale (0 = not true, 1 = somewhat true, 2 = certainly true), producing subscales with five items each for hyperactivity/inattention, conduct problems, emotional symptoms, peer problems and prosocial behavior. A confirmatory factor analysis was conducted to assess the theoretical five-factor model for the SDQ proposed by Goodman (2001). A modestly modified five-factor solution fitted the data acceptably, accounting for one cross-loading ($\chi^2 = 761.69$ (264), $p < .001$, RMSEA = .050, CFI = .918, TLI = .906). See Table 2 for the scale items, internal consistencies and factor loadings for the five-factor model with modification.

3.3. Demographic measures

Child's sex (sex assigned at birth) and Apgar score 5 minutes after birth, and parental age, educational level and socio-economic status (SES) were included in the analyses as covariates, if associated statistically significantly with social-emotional development scales (Table 1). Sex was coded as 0 for boys and 1 for girls. The extremely non-normally distributed Apgar scores (range: 1–10) were converted to dichotomous variables for greater statistical power. 14.7% of the children had Apgar scores equal to or below 8 and the rest scored 9 or 10. The age of the mothers ranged from 18.3 to 44.4 years and of the fathers, from 18.4 to 60.10 years. Parental age was recoded into the following three classes: $\leq 25=1$, $26-35=2$, $\geq 36=3$. Parental educational level was classified as 1 for a high educational level, (e.g., a university degree, but also a degree obtained at a university of applied sciences), versus 0 for a lower level of education, (e.g., school or community level education and persons with no vocational education). Family SES was indicated by the parents' occupations, first coded according to the International Standard Classification of Occupations (ISCO-08; International Labour Organization, 2012), and further recoded as 1 for professionals, (e.g., managerial, but also in intermediate positions) and 0 for others, (e.g., blue-collar workers in industry or agriculture and service workers). The dichotomized SES was applied to simplify the analyses and to mitigate the potential for measurement error. Family occupations as proxies for SES capture the dimensions of the multidimensional construct; occupations reflect both the economic aspect (i.e. income and wealth) as well as the social aspect (i.e. prestige and social networks) of it. Further, ISCO-08 occupational categories provide a standardized way to categorize and analyse socioeconomic differences which further allows for comparability across different studies and contexts.

Table 2
Parameter estimates from the results of confirmatory factor analyses of the parent-rated Strengths and Difficulties Questionnaire (SDQ) five-dimensional model.

	1	2	3	4	5
1 Prosocial behaviour ($\alpha=.71$)					
Considerate of other people's feelings	.57			-.37	
Shares readily with other children (treats, toys, pencils, etc.)	.49				
Helpful if someone is hurt, upset or feeling ill	.82				
Kind to younger children	.70				
Often volunteers to help others (parents, teachers, other children)	.74				
2 Hyperactivity ($\alpha=.79$)					
Restless, overactive, cannot stay still for long		.86			
Constantly fidgeting or squirming		.77			
Easily distracted, concentration wanders		.84			
Thinks things out before acting		.69			
Sees tasks through to the end, good attention span ^a		.67			
3 Emotional symptoms ($\alpha=.63$)					
Often complains of headaches, stomach-aches or sickness			.49		
Many worries, often seems worried			.80		
Often unhappy, downhearted or tearful			.92		
Nervous or clingy in new situations, easily loses confidence			.46		
Many fears, easily scared			.69		
4 Conduct problems ($\alpha=.63$)					
Often has temper tantrums or hot tempers				.75	
Generally obedient, usually does what adults request ^a				.76	
Often fights with other children or bullies them				.66	
Often lies or cheats				.61	
Steals from home, school or elsewhere				.62	
5 Peer problems ($\alpha=.58$)					
Rather solitary, tends to play alone					.30
Has at least one good friend ^a					.70
Generally liked by other children ^a					.78
Picked on or bullied by other children					.73
Gets on better with adults than with other children					.47

Note
^a Recoded items; all standardised factor loadings were statistically significant ($p < .001$).

3.4. Analytic strategy

The differences in the social-emotional development scales between groups based on individual and family background variables were analysed with Mann Whitney U or t-tests and ANOVA on continuous variables and chi-square tests of independence for dichotomous variables using IBM SPSS Statistics 23. Of these, the statistically significant

variables were added into further analyses as covariates. To test the hypothesised model of social-emotional difficulties and strengths at eight years, structural equation modelling (SEM) analysis was performed. Analyses were conducted using, first, confirmatory factor analysis (CFA) to develop the appropriate measurement models and, second, SEM to assess the regressions, including the CFA models and observed variables. For interpretability, the SDQ prosocial behavior scale was recoded to align with the direction of the SDQ problem scales, where a higher value indicates less prosocial behavior. Fig 1 illustrates the measurement model, including hypothesised effects between the study factors.

The fit of the models was evaluated using the chi-square test statistic and fit indices, including root mean square error of approximation (RMSEA), Tucker-Lewis index (TLI) and comparative fit index (CFI). The following cut-off values were applied: RMSEA values under 0.08 and TLI and CFI values preferable over 0.95 (e.g., Hu & Bentler, 1999), but acceptable if over 0.90 (e.g., Kline, 1998; Metsämuuronen, 2009). While the ratios of the chi-square statistic and degrees of freedom were carefully considered, the statistical significance of the chi-square value alone was not interpreted as indicating an inadequate fit (Byrne, 2012; Hu & Bentler, 1995). The analyses were carried out using the Mplus 8.0 software (Muthén & Muthén, 1998–2017) with the robust weighted least square mean and variance adjusted estimation (WLSMV), which is appropriate for modelling categorical or ordered data and does not assume normally distributed variables (Brown, 2006). For the small amount of missing data (0.1–0.5% per item), we applied pairwise deletion as suggested when using the WLSMV estimator (Asparouhov & Muthen, 2010).

4. Results

4.1. Descriptive statistics

At 18 months, 15.4% of children (boys 15.8%; girls 15.0%) had scores in the of-concern range on the BITSEA problem scale and 6.6% were identified as having competence delays (boys 8.7%; girls 4.4%) (Table 3). At the age of eight years, 12.7% of children (boys 16.6%; girls 8.3%) had scores in the of-concern range on the SDQ. Sex differences were found in almost all social-emotional subscales, with boys having more competence delays at 18 months and showing significantly higher problem scores and lower prosocial behavior scores than girls at eight years. When looking at the effect sizes of differences between boys and girls at different time points (Cohen's effect size value $ESr^{18months} = .34$ and $ESr^{8years} = -.44$), sex differences seem to strengthen over time. Other background variables showed mixed associations. Child Apgar score and parental socioeconomic status were not associated with any social-emotional scales.

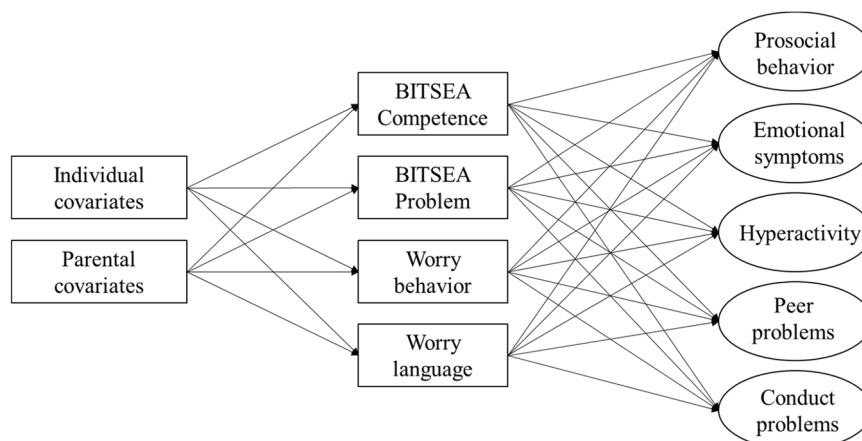


Fig 1. Conceptual model depicting the associations between the study variables. Note: Covariates controlled for SDQ factors also.

Table 3

Frequency of children with scores in the of-concern range on the BITSEA problem and competence delay scales (%), and on the SDQ difficulties and strengths scales (Mean and Standard Deviation for total score) by sex, family demographics and parental worry.

Sociodemographic		BITSEA/P ^c		BITSEA/C ^c		SDQ difficulties ^d		SDQ strengths ^d	
		%	p	%	p	M (SD)	p	M(SD)	p
Sex	Boy	15.8		8.7		7.9(5.0)		6.8(1.9)	
	Girl	15.0	.803	4.4	.039	6.6(4.5)	.000	7.7(1.8)	.000
Apgar score 9–10	1–8	15.5		7.0		7.6(4.3)		7.2(1.9)	
		15.2	.944	7.0	.92	7.2(4.9)	.442	7.2(1.9)	.719
Age Mother	≤ 25	17.0		7.4		9.3(5.2)		7.5(1.8)	
	26–35	16.1		7.1		7.3(4.9)		7.2(1.9)	
	≥ 36	13.7	.651	6.9	.989	6.7(4.3)	.004	7.4(1.9)	.329
Father	≤ 25	13.9		5.6		8.6(4.4)		7.5(1.8)	
	26–35	15.1		6.4		7.5(5.0)		7.2(1.9)	
	≥ 36	16.6	.820	8.8	.406	6.7(4.4)	.045	7.2(2.0)	.730
Socioeconomic status ^a									
Mother ≥ professional		10.9		6.6		6.7(4.2)		7.2(1.9)	
Other		16.9	.072	7.1	.848	7.4(5.0)	.061	7.2(1.9)	.899
Father ≥ professional		12.8		9.2		6.6(4.5)		7.2(2.0)	
Other		16.9	.219	6.2	.224	7.5(4.9)	.835	7.3(1.9)	.467
Education ^b									
Mother higher		15.4		6.5		7.0(4.5)		7.2(1.9)	
Lower		12.7	.399	7.5	.688	7.7(5.0)	.094	7.3(2.0)	.747
Father higher		13.0		8.2		6.9(4.4)		7.0(2.0)	
lower		17.0	.191	5.9	.302	7.5(5.0)	.057	7.4(1.9)	.014
Family income	<£3,000	15.4		6.3		7.7(4.8)		7.1(1.9)	
	≥£3,000	14.9	.884	7.3	.656	6.8 (4.7)	.006	7.4(2.0)	.060
Parental worry behaviour									
		No	13.2	6.4		7.0(4.6)		7.2(1.9)	
		Yes	39.1	10.9	.111	9.4(5.8)	.003	6.6(2.0)	.013
language		No	13.7	6.5		6.9(4.5)		7.2(1.9)	
		Yes	27.3	9.1	.255	9.3(5.7)	<.001	6.8(2.0)	.039
Total		15.4		6.6		7.3(4.8)		7.2(1.9)	

Differences between groups: *significant at the 0.05 level, **significant at the 0.01 level, ***significant at the 0.001 level.

Notes:

^a Classification: professionals (in senior positions, e.g., managerial, but also in intermediate positions, such as nurses) vs others [blue-collar workers (in industry or agriculture) and service workers (e.g., clerical and sales)]

^b Classification: higher (high educational level, e.g., university degree, but also polytechnic degree) vs lower level (school or community level and persons with no vocational education).

^c Cross-tab with chi-square analysis for categorical data.

^d Nonparametric t-test for group comparison (Mann-Whitney U test).

Parental age was associated with SDQ difficulties and fathers' education with SDQ strengths. The children with younger parents showed higher SDQ difficulties scores than children with older parents and children whose fathers had a lower educational level scored higher on the SDQ strengths scale than did peers whose fathers had a higher educational level. All background variables showing significant associations with social-emotional scales presented in Table 1 were included in further analyses as covariates.

4.2. Structural model of social-emotional strengths and difficulties

Proceeding to SEM analysis, the hypothesised conceptual model depicted in Fig 1 was tested. The initial model including all covariates significantly associated with social-emotional factors presented in Table 3 could not be verified. After omitting all the non-significant paths, the model fit the data well ($\chi^2 = 484.96$, $df = 232$, $p < .001$, $RMSEA = .044$, $CFI = .931$, $TLI = .920$). Fig 2 shows the standardised beta coefficients for the depicted associations. Only significant

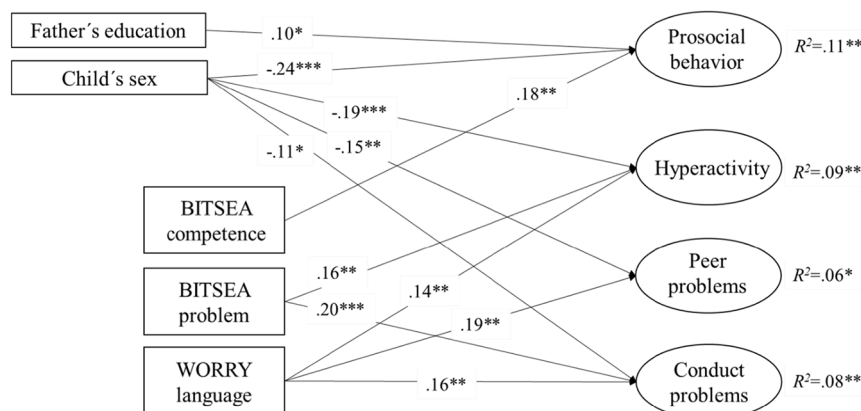


Fig 2. Structural equation model of the relations between social-emotional problems, competence delays and parental worry at 18 months and social-emotional development at eight years (controlling for child's sex). Note: Standardised coefficients; *** $p < .001$; ** $p < .01$; * $p < .05$.

associations are presented.

The results in Fig 2 show that both SEB problems and competence delay at 18 months predicted childrens SE development at eight years. While competence delay was associated with less prosocial behavior, SEB problems predicted hyperactivity and conduct problems. Moreover, parental worry about early language development was found to be associated with SEB problems, (i.e., hyperactivity, peer problems and conduct problems). SEB problems were elevated among boys compared to girls at the age of eight. Similarly, boys demonstrated less prosocial behavior than girls. However, sex differences were not identified at 18 months. While other family-related sociodemographic variables were not associated with SE development, fathers' education predicted prosocial behavior: the higher the educational level of the father, the less prosocial their child's behavior.

5. Discussion

The aim of the present two-wave longitudinal study was to examine whether social-emotional problems and competence delay at 18 months would be associated with SEB problems and prosocial behavior at the age of eight years. We also focused on possible sex- and family-related factors that could shape developmental trajectories during early childhood.

We found that approximately 15% of toddlers in the study showed social-emotional problems (see also Haapsamo et al., 2009) while 6.6% were identified as having competence delays. There is a difference in the level of prevalence of SEB problems compared e.g. to studies made in U. S. for in a study by Briggs-Gowan and Carter (2006) 22,9 percentage had of-concern BITSEA scores. The corresponding percentage for problems at eight years in this study was 12.7% (in Denmark 10% see Elberling et al., 2010). Differences in the child's sex and SE development were more prominent at eight years compared to 18 months. Consistent with previous research, boys showed more SEB problems and more limited SE strengths than girls did at the age of eight years, but there were no differences in SEB problems at the age of 18 months (e.g., Alakortes et al., 2015). However, boys already showed less SE competence at the early age and as seen from the growth of the effect sizes, the sex differences strengthen over time.

Competence delay at 18 months might indicate that development of shared attention and intention (pointing, hugging or feeding dolls, stuffed animals) is compromised. Ability to share attention and recognise the intention of others is fundamentally important for being an equal member in various social environments (see Tomasello, 2019). Therefore, it is not surprising that decreased social competence was linked with decreased prosociality and conduct problems at eight years. These children might engage in behavior that violates social or ethical norms. This could include things like lying, cheating or aggressive behavior. It is widely known that sharing attention and recognition of intentions are the first signs of developing the ability to read others' minds and of optimal social-emotional development (Tomasello, 2020).

In addition, delays in social competence at toddlerhood did not predict later emotional problems. Toddlers showing less interest in other minds might be at risk for increasing difficulties in social relationships without any signs of emotional problems. Emotional problems in SDQ refer to complaints about headaches, worries, fears or unhappiness that are signs of internalising behavior. They do not describe children in relation to others in a manner similar to prosociality or conduct problems (i.e., relational aggression).

Extensive research has documented the stability of social-emotional problems (e.g., Briggs-Gowan et al., 2006; Maasalo et al., 2020; Mäntymaa et al., 2012; Pihlakoski et al., 2006; van Zeijl et al., 2006). However, fewer studies to date have examined the predictive role of SEB problems and competence delays on differentiated social-emotional strengths and difficulties scales across childhood. We hypothesised differentiated longitudinal associations between of-concern screening status in problem behavior or competence delay at toddlerhood and

measures of social-emotional strengths and difficulties at the age of eight. Adding parental worry as a predictor in the same structural model, we simultaneously analysed its power, along with of-concern screening status, to longitudinally predict SEB problems.

Controlling for covariates, being diagnosed as having SEB problems or competence delay and parental worry about language development at 18 months predicted childrens SEB development at eight years, explaining six to eleven percent of the variance in SE strengths and difficulties. While both BITSEA screening statuses predicted later SEB development, they showed differentiated, within domain associations. Toddlers who were screened to be in the of-concern range on the BITSEA competence scale showed less prosocial behavior at eight years than their peers in the no-concern group. However, having competence delay was not associated with having other SEB problems in later life. Instead, having a BITSEA of-concern problem status predicted both hyperactivity and conduct problems, but not having peer or emotional problems. In fact, none of the measures at 18 months were associated with emotional problems at eight years. Similar to the lack of associations between early SEB problems and later emotional problems, neither SEB problems nor delay in SE competence predicted peer problems at the age of eight.

According to our results, early SEB problems predict some but not all aspects of later SE development. Thus, identifying differential longitudinal associations between the SE scales is important as regards being able to build effective and more specific intervention. Based on our study results, parental worry about childrens development should not be ignored. While parental worry correlates with BITSEA of-concern scores, it can also be an indicator of later SEB problems. As shown in the structural equation model, parental worry about the language development of their children at 18 months uniquely predicted school-age externalising SE problems. Language development is important when pondering later SEB difficulties. In a study by Rautakoski et al., (2021) results indicated that lower early communication skills can predict delays in the development of social-emotional competencies, which has been found to be a risk factor for later development of social-emotional and behavioral problems (see also Rajalin et al., 2021). St Clair and colleagues (2019) also found that children at risk of developmental language disorder had increased rates of emotional problems throughout early and middle childhood. Parental worry about their child's behavior and emotions was associated with SEB problems at the age of 18 months, but did not predict later SEB problems in this study. Nonetheless, the identification of problems at 18 months was strongly associated with problems at the age of eight years.

In the present study we examined the construct validity of the five-factor SDQ. With regards to the factor structure of the instrument, our results were in line with the findings from other studies supporting a five-factor model. Acceptable fit, however, was only obtained after accounting for one cross-loading between the considerate of other people's feelings item and the conduct problems latent factor.

5.1. Limitations and future research directions

One of the strengths of this study is the size of the sample and the examination of associations between early and later SEB problems with structural equation modelling (SEM). It can also be considered a strength that at both time points SEB development was explored using a structured, age-appropriate screening tool. Both these measures have acted as a valid method when screening SEB problems. However, the only source in this study were parents. To mitigate these biases in parental reports as depicted above, it is recommended that future research engage multiple informants (e.g., teachers, caregivers, or the children themselves), employ standardized assessment tools, and incorporate objective measures when possible. Combining different sources of information can provide a more comprehensive and accurate picture of children's social-emotional difficulties.

5.2. Conclusions and implications

Taken together; parental screening of social-emotional problems and competence delay, as well as being worried about their child's development, should be considered a reliable indicator of actual problems which, if left unaddressed, may have long-lasting effects on the child's SE development across and beyond their childhood. Anxious and concerned parents signal insecurity that children are mirroring. Mirroring negative emotions diminishes feelings of security causing over-alertness and restlessness that can turn to behavioral problems. Still relying only on parental worry early in development might miss many children at risk, as this was evidenced by the lack of prediction from worry about behavior, emotions, relationships. Our findings revealed that boys were overrepresented in competence delays at 18 months of age and in risky behaviors at 8 years. These results highlight the importance of carefully considering gender differences and emphasizing gender-sensitive approaches in education (see Eskelinen & Itäkare, 2020; Ylitapio-Mäntylä, 2012).

This study shows that it would be most important to identify both competence delays and possible SEB problems at early ages in both child health clinics and in early education settings. To identify these problems, professionals need to have more knowledge about toddlers social, emotional and behavioral development and problems, as we know that improvements are needed as regards understanding and attitudes towards children with SEB problems (e.g., Pihlaja, 2003; Pihlaja, 2008; Viitala, 2014). Too often, the strategy is to “wait and see” how development progresses.

CRedit authorship contribution statement

Päivi M.E. Pihlaja: Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Data curation. **Piia-Kaisa Åminne:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Data curation. **Alice S. Carter:** Writing – review & editing, Writing – original draft, Resources. **Nina Sajaniemi:** Writing – review & editing.

Acknowledgements

We are grateful to the families what have taken part to this longitudinal study. Also the STEPS-study team for cooperation ja joint research.

Funding

This work was supported by the Finnish National Agency for Education

Data availability

The data that has been used is confidential.

References

- Alakortes, J., Kovaniemi, S., Carter, A., Bloigu, R., Moilanen, I., & Ebeling, H. (2017). Do child healthcare professional and parents recognize social-emotional and behavioral problems in 1-year-old infants? *European Child and Adolescent Psychiatry*, 26(4), 481–495.
- Alakortes, J., Fyrsten, J., Carter, A., Moilanen, I., & Ebeling, H. (2015). Finnish mothers' and fathers' reports of their boys and girls using the brief infant-toddler social and emotional assessment (BITSEA). *Infant Behavior and Development*, 39, 136–147.
- Asparouhov, T., & Muthén, B. (2010). Weighted least squares estimation with missing data. Retrieved from <http://www.statmodel.com/download/GstrucMissingRevision.pdf> [16.03.2021].
- Baillargeon, R. H., Zoccolillo, M., Keenan, K., Côté, S., Pérusse, D., Wu, H.-X., Boivin, M., & Tremblay, R. E. (2007). Early gender differences in physical aggression. *Developmental Psychology*, 43(1), 13–26.
- Baillargeon, R. H., Morisset, A., Keenan, K., Normand, C. L., Jeyaganth, S., Boivin, M., & Tremblay, R. E. (2011). The development of prosocial behaviors in young children: A prospective population-based cohort study. *The Journal of Genetic Psychology*, 172(3), 221–251. <https://doi.org/10.1080/00221325.2010.533719>
- Beermink, A.-C., Swinkels, S., & Buitelaar, J. K. (2007). Problem behavior in a community sample of 14- and 19-month-old children. *European Child & Adolescent Psychiatry*, 16, 271–280.
- Borg, A.-M., Kaukonen, P., Joukamaa, M., & Tamminen, T. (2014). Finnish norms for young children on the strengths and difficulties questionnaire. *Nordic Journal of Psychiatry*, 68(7), 433–442. <https://doi.org/10.3109/08039488.2013.853833>
- Brauner, C. B., & Stephens, C. B. (2006). Estimating the prevalence of early childhood serious emotional/behavioral disorders: Challenges and recommendations. *Public Health Reports*, 121, 303–310.
- Briggs-Gowan, M., & Carter, A. (2008). Social-emotional Screening Status in Early Childhood Predicts Elementary School Outcomes. *Pediatrics*, 121(59), 957–962.
- Briggs-Gowan, M. J., & Carter, A. (2006). *The Brief Infant-Toddler Social and Emotional Assessment (BITSEA)*. New Haven, CT: Yale University. Examiner's manual.
- Briggs-Gowan, M., Carter, A., Bosson-Heenan, J., Guyer, A. E., & Horwitz, S. M. (2006). Are Infant-Toddler Social-Emotional and Behavioral Problems Transient? *Journal of the American Academy of Child & Adolescent Psychiatry*, 45(7), 849–858.
- Briggs-Gowan, M., Carter, A., Irwin, J. R., & Cicchetti, D. V. (2004). The Brief Infant-Toddler Social and Emotional Assessment: Screening for Social-Emotional Problems and Delays in Competence. *Journal of Pediatric Psychology*, 29(2), 143–155.
- Briggs-Gowan, M., Carter, A., Skuban, E., & Horwitz, S. M. (2001). Prevalence of social-emotional and behavioral problems in a community sample of 1- and 2-year-old children. *Journal of the American Academy of Child and Adolescent Psychiatry*, 40(7), 811–819.
- Brown, T. A. (2006). *Confirmatory factor analysis for applied research*. New York, NY: Guilford Press.
- Byrne, B. M. (2012). *Structural equation modeling with Mplus. Basic concepts, applications, and programming*. Routledge.
- Calkins, S. D., Smith, C. L., Gill, K., & Johanson, M. C. (1998). Maternal interactive style across contexts. Relations to emotional, behavioral and psychological regulation during toddlerhood. *Social Development*, 7, 350–369.
- Carneiro, F. A., Costa, P. A., & Leal, I. (2023). Construct-related validity of the strengths and difficulties questionnaires with three and five dimensions: A multitrait-multimethod analysis. *Clinical Child Psychology and Psychiatry*, 28(24), 1595–1611. <https://doi.org/10.1177/13591045231168703>
- Carter, A., Briggs-Gowan, M., & Davis, N. (2004). Assessment of young children's socio-emotional development and psychopathology: Recent advances and recommendations for practice. *Journal of Child Psychology and Psychiatry*, 45(1), 109–134.
- Carter, A., Briggs-Gowan, M., Jones, S. M., & Little, T. D. (2003). The Infant-Toddler Social and Emotional Assessment (ITSEA): Factor Structure, Reliability, and Validity. *Journal of Abnormal Child Psychology*, 31(5), 495–514.
- Côté, S., Vaillancourt, T., LeBlanc, J.C., Nagin, D.S., & Tremblay, R.E. (2006). The development of physical aggression from toddlerhood to pre-adolescence: A nationwide longitudinal study of Canadian children. *Journal of Abnormal Child Psychology*, 34(1), 71–85. <https://doi.org/10.1007/s10802-005-9001-z>
- Dickey, W. C., & Blumberg, S. J. (2004). Revisiting the factor structure of the strengths and difficulties questionnaire: United States, 2001. *Journal of American Academic Child Psychiatry*, 43(9), 1159–1167.
- Dodge, K. A., Coie, J. D., & Lynam, D. (2006). Aggression and Antisocial Behavior in Youth. In N. Eisenberg, W. Damon, & R. M. Lerner (Eds.), *Handbook of child psychology: Social, emotional, and personality development* (6th ed., pp. 719–788). John Wiley & Sons, Inc.
- Eskelinen, M., & Itäkare, S. (2020). Pidetään huolta, ettei erotella tyttöjen ja poikien juttuja”. Tasa-arvoa, yhdenvertaisuutta ja sukupuolisensitiivisyyttä rakentavat diskurssit paikallisissa varhaiskasvatussuunnitelmissa [Let's take care not to divide things between girls and boys]. *Journal of Early Childhood Education Research*, 9(2), 197–229.
- Goodman, R., Ford, T., Simmons, H., Gatward, R., & Meltzer, H. (2000). Using the strengths and difficulties questionnaire (SDQ) to screen for child psychiatric disorders in a community sample. *British Journal of Psychiatry*, 177, 534–539.
- Goodman, A., Lamping, D. L., & Ploubidis, G. B. (2010). When to use broader internalising and externalising subscales instead of the hypothesised five subscales on the strengths and difficulties questionnaire (SDQ): Data from British parents, teachers and children. *Journal of Abnormal Child Psychology*, 38, 1179–1191.
- Goodman, R. (1997). The strengths and difficulties questionnaire: A research note. *Journal of Child Psychology and Psychiatry*, 38(5), 581–586.
- Goodman, R. (1999). The extended version of the strengths and difficulties questionnaire as a guide to child psychiatric caseness and consequent burden. *Journal of Child Psychology and Psychiatry*, 40(5), 791–799.
- Goodman, R. (2001). Psychometric properties of the strengths and difficulties questionnaire. *Journal of the American Academy of Child and Adolescent Psychiatry*, 40, 1337–1345.
- Grazuleviciene, R., Andrustaityte, S., Petravičienė, I., & Balseviciene, B. (2017). Impact of psychosocial environment on young children's emotional and behavioral difficulties. *International Journal of Environmental Research and Public Health*, 14(10), 1278. <https://doi.org/10.3390/ijerph14101278>.
- Haapsamo, H., Ebeling, H., Soini, H., Joskitt, L., Larinen, K., Penninkilampi-Kerola, V., & Moilanen, I. (2009). Screening infants with social and emotional problems: A pilot study of the brief infant toddler social and emotional assessment (BITSEA) in Northern Finland. *International Journal of Circumpolar Health*, 68(4), 386–393.

- Hauser-Cram, P., & Woodman, A.C. (2016). Trajectories of internalizing and externalizing behavior problems in children with developmental disabilities. *Journal of Abnormal Child Psychology*, 44, 811–821. <https://doi.org/10.1007/s10802-015-0055-2>
- Hay, D. F., Castle, J., & Davies, L. (2000). Toddlers' use of force against familiar peers: a precursor of serious aggression? *Child Development*, 71(2), 457–467. <https://doi.org/10.1111/1467-8624.00157>. PMID: 10834477.
- Hjern, A., Bergström, M., Fransson, E., Lindfors, A., & Bergqvist, K. (2021). Birth order and socioeconomic disadvantage predict behavioural and emotional problems at age 3 years. *Acta Paediatrica*, 110, 3294–3301.
- Hosokawa, R., & Katsura, T. (2018). Role of parenting style in children's behavioral problems through the transition from preschool to elementary school according to gender in Japan. *International Journal of Environ Res Public Health*, 16(1), 21. <https://doi.org/10.3390/ijerph16010021>
- Hu, L., & Bentler, P. M. (1995). Evaluating model fit. Ed. In R. H. Hoyle (Ed.), *Structural equation modeling. Concepts, issues, and applications* (pp. 76–99). Sage
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6, 1–55.
- International Labour Organization (2012). International standard classification of occupations – ISCO-08. Vol. 1. Structure, group definitions and correspondence tables. International Labour Office.
- Jacobsen, H., Bergsund, H. B., Wentzel-Larsen, T., Smith, L., & Moe, V. (2020). Foster children are at risk for developing problems in social-emotional functioning: A follow-up study at 8 years of age. *Children and Youth Services Review*, 108. <https://doi.org/10.1016/j.chidyouth.2019.104603>
- Keane, S. P., & Calkins, S. D. (2004). Predicting kindergarten peer socialstatus from toddler and preschool problem behavior. *Journal of Abnormal Child Psychology*, 32, 409–423.
- Kline, R. B. (1998). *Principles and practice of structural equation modeling*. Guilford Press.
- Kochanska, G., Philibert, R., & Barry, R. A. (2009). Interplay of genes and early mother-child relationship in the development of self-regulation from toddler to preschool age. *Journal of Child Psychology and Psychiatry*, 50(11), 1331–1338. <https://doi.org/10.1111/j.1469-7610.2008.02050.x>
- Koskelainen, M., Sourander, A., & Kaljonen, A. (2000). The strengths and difficulties questionnaire among Finnish school-aged children and adolescents. *European Child and Adolescent Psychiatry*, 9, 277–284.
- Koskelainen, M. (2008). *The Strengths and Difficulties Questionnaire (SDQ-Fin) among Finnish children and adolescents*. University of Turku, Finland.
- Kovaniemi, S., Alakortes, J., Carter, A., Yliherva, A., Bloigu, R., Joskitt, L., ... Ebeling, H. (2018). How are social-emotional and behavioral competences and problems at age 1 year associated with infant motor development? A general population study. *Infant behavior Development*, 51, 1–14.
- Kroes, G., Veerman, J. W., & De Bruyn, E. E. J. (2006). Bias in parental reports? *European Journal of Psychological Assessment*, 19(3), 195–203. <https://doi.org/10.1027//1015-5759.19.3.195>
- Kruizinga, I., Jansen, W., de Haan, C. L., der Ende, J., Carter, A., & Raat, R. (2012). Reliability and Validity of the Dutch version of the Brief Infant-Toddler Social and Emotional Assessment (BITSEA). *Plos One*, 7(6), Article e38s762. <https://doi.org/10.1371/journal.pone.0038762>
- Kruizinga, I., Jonasen, W., van Sprang, N. C., Careter, A., & Raat, H. (2015). The effectiveness of the BITSEA as a tool to early detect psychosocial problems in toddlers, a cluster randomized trial. *PLOS ONE*, 19(9), Article e0136488. <https://doi.org/10.1371/journal.pone.0136488>
- Lagström, H., Rautava, P., Kaljonen, A., Riihinen, H., Pihlaja, P., Korpilampi, P., ... Niemi, P. (2013). Cohort profile: Steps to the healthy development and well-being of children (the STEPS Study). *International Journal of Epidemiology*, 42(5), 1273–1284. <https://doi.org/10.1093/ije/dys150>
- Li, X., & Zhou, S. (2021). Parental worry, family-based disaster education and children's internalizing and externalizing problems during the COVID-19 pandemic. *Psychological Trauma: Theory, Research, Practice, and Policy*, 13(4), 486–495.
- Mäntymaa, M., Puura, K., Luoma, I., Latva, R., Salmelin, R. K., & Tamminen, T. (2012). Predicting internalizing and externalizing problems at five years by child and parental factors in infancy and toddlerhood. *Psychiatry and Human Development*, 43(2), 153–170.
- Möricke, E., Lappenschaar, G. A. M., Swinkels, S. H. N., Rommelse, N. N. J., & Buitelaar, J. (2014). Different stability of social-communication problems and negative demanding behaviour from infancy to toddlerhood in a large Dutch population sample. *Child and Adolescent Psychiatry and Mental Health*, 8(19).
- Möricke, E., Lappenschaar, G. A., Swinkels, S. H., Rommelse, N. N., & Buitelaar, J. K. (2013). Latent class analysis reveals five homogeneous behavioural and developmental profiles in a large Dutch population sample of infants aged 14-15 months. *European Child & Adolescent Psychiatry*, 22(2), 103–115. <https://doi.org/10.1007/s00787-012-0332-3>
- Maasalo, K., Lindblom, J., Kiviruusu, O., Santalahti, P., & Aronen, E. (2020). Longitudinal associations between social-inhibitory control and externalizing and internalizing symptoms in school-aged children. *Development and Psychopathology*, 1–13. <https://doi.org/10.1017/S0954579420000176>
- Mathiesen, K. S., & Sanson, A. (2000). Dimensions of early childhood behavior problems: Stability and predictors of change from 18 to 30 months. *Journal of Abnormal Child Psychology*, 28(1), 15–31.
- Mesman, J., & Koot, H. M. (2001). Early preschool predictors of preadolescent internalizing and externalizing DSM-IV diagnoses. *Journal of the American Academy of Child and Adolescent Psychiatry*, 40, 1029–1036.
- Metsämuuronen, J. (2009). Tutkimuksen tekeminen perusteet ihmistieteissä 4 [The basis for conducting research in human sciences 4]. *Gummerus Kirjapaino Oy*.
- Miner, J. L., & Clarke-Stewart, K. A. (2008). Trajectories of externalizing behavior from age 2 to age 9: Relations with gender, temperament, ethnicity, parenting, and rater. *Developmental Psychology*, 44(3), 771–786. <https://doi.org/10.1037/0012-1649.44.3.771>
- Muthén, L. K., & Muthén, B. O. (1998) (2017). Mplus user's guide. Eighth Edition. Muthén, & Muthén.
- Najman, J., Williams, G., Nikles, J., Spence, S., Bor, W., O'Callaghan, M., Le Brocque, R., Andersen, M. J., & Shuttlesworth, G. J. (2001). Bias influencing maternal reports of child behaviour and emotional state. *Soc Psychiatry Psychiatr Epidemiol*, 36, 186–194. <https://doi.org/10.1007/s001270170062>
- Nederhof, A.J. (1985). Methods of coping with social desirability bias: A review. *European Journal of Social Psychology*. <https://doi.org/10.1002/ejsp.2420150303>.
- Obel, C., Heiervang, E., Rodriguez, A., Heyerdahl, S., Smedje, H., Sourander, A., Guethmundsson, O. O., & Olsen, J. (2015). The strengths and difficulties questionnaire in the nordic countries. *European Child and Adolescent Psychiatry*, 13(2), 32–39. <https://doi.org/10.1007/s00787-004-2006-2>. PMID: 15243784.
- Ortuño-Sierra, J., Fonseca-Pedrero, E., Arito-Solana, R., & IMAGEN consortium. (2015). New evidence of factor structure and measurement invariance of the SDQ across five European nations. *European Child and Adolescent Psychiatry*, 24, 1523–1534.
- Pihlaja, P. (2003). *Varhaiseryityskasvatusta suomalaisessa päivähoitossa. Erityiset tuen tarpeet sosiaalis-emotionaalisella ja kielen kehityksen alueilla [Early childhood special education in Finnish daycare. Special needs in socio-emotional and language development]*. University of Turku.
- Pihlaja, P. (2008). Behave Yourself! - examining meanings of children with socio-emotional difficulties. *Disability & Society*, 23(1), 5–15. <https://doi.org/10.1080/09687590701725518>
- Pihlakoski, L., Sourander, A., Aromaa, M., Rautava, P., Helenius, H., & Sillanpää, M. (2006). The continuity of psychopathology from early childhood to preadolescence. *European Child and Adolescent Psychiatry*, 15, 409–417. <https://doi.org/10.1007/s00787-006-0548-1>
- Qi, C. H., & Kaiser, A. P. (2003). Behavior problems of preschool children from low-income families: Review of the literature. *Teaching Early Childhood Special Education*, 23, 188–216.
- Rajalin, S., Pihlaja, P., Carter, A., & Rautakoski, P. (2021). Associations between social emotional and language domains in toddlerhood - The Steps Study. *Journal of Child Language Acquisition and Development*, 9(2), 223–248.
- Rescorla, L. A., Achenbach, T. M., Masha, Y. I., Harder, V. S., Otten, L., Bilenberg, N., Bjarnadottir, G., & Verhulst, F. C. (2011). International comparisons of behavioral and emotional problems in preschool children: Parents' reports from 24 societies. *Journal of Clinical Child and Adolescent Psychology*, 40(3), 456–467.
- Rubin, K. H., Burgess, K. B., Dwyer, K. M., & Hastings, P. D. (2003). Predicting preschoolers' externalizing behaviors from toddler temperament, conflict, and maternal negativity. *Developmental Psychology*, 39(1), 164–176. <https://doi.org/10.1037/0012-1649.39.1.164>
- Runge, R.A., & Soellner, R. (2022). Cultural bias in parent reports: The role of socialization goals when parents report on their child's problem behavior. *Child Psychiatry Hum Dev*. <https://doi.org/10.1007/s10578-022-01464-y>.
- Skovgaard, A. M., Houmann, T., Christiansen, E., Landorph, S.Jørgensen, T., ... (2007). The prevalence of mental health problems in children 1,5 years of age – The Copenhagen child cohort 2000. *The Journal of Child Psychology and Psychiatry*, 48(1), 62–70. <https://doi.org/10.1111/j.1469-7610.2006.01659.x>
- Skovgaard, A. M., Olsen, E. M., Christiansen, E., Houmann, T., Landorph, S. L., Jørgensen, T., & CCC 2000 Study Group. (2008). Predictors (0-10 months) of psychopathology at age 11/2 years - a general population study in The Copenhagen Child Cohort CCC 2000. *Journal of Child Psychology and Psychiatry*, 49(5), 553–562. <https://doi.org/10.1111/j.1469-7610.2007.01860.x>
- Spittle, A. J., Treyvaud, K., Doyle, L. W., Roberts, G., Lee, K. J., Inder, T. E., Cheong, M. D., Hunt, R. W., Newnham, C. A., & Andersson, P. J. (2009). Early emergence of behavior and social-emotional problems in very preterm infants. *Journal of the American Academy of Child & Adolescent Psychiatry*, 48(9), 909–918.
- Clair, M. C., St, Forrest, C. L., Kok Yew, S. G., & Gibsons, J. L. (2019). Early risk factors and emotional difficulties in children at risk of developmental language disorder: A population cohort study. *Journal of Speech, Language, and Hearing Research*, 62, 2750–2771.
- Steele, E., Wong, E., Karahalios, A., Johnson, S., Weston, K., Kremer, P., de Silva, A., Davis, E., Nolan, T., & Waters, E. (2015). The influence of social disadvantage on children's emotional and behavioral difficulties at age 4-7 years. *The Journal of Pediatrics*, 167(2), 442–448.
- Thomasello, M. (2019). *Becoming a human. A theory of ontogeny*. Harvard University Press.
- Tomasello, M. (2020). The adaptive origins of uniquely human sociality. *Philosophical Transactions of the Royal Society B*, 375, Article 20190493, 1803 <https://doi.org/10.1098/rstb.2019.0493>.
- van de Looij-Jansen, P. M., Goedhart, A. W., de Wilde, E. J., & Treffers, P. D. (2011). Confirmatory factor analysis and factorial invariance analysis of the adolescent self-report Strengths and Difficulties Questionnaire: how important are method effects and minor factors? *British Journal of Clinical Psychology*, 50, 127–144.
- Van Zeijl, J., Mesman, J., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Juffer, F., Stolk, M. N., ... Alink, L. R. A. (2006). Attachment-based intervention for enhancing sensitive discipline in mothers of 1- to 3-year-old children at risk for externalizing behavior problems: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, 74(6), 994–1005. <https://doi.org/10.1037/0022-006X.74.6.994>
- Viitala, R. (2014). *Jotenkin häiriökäs: Etnografinen tutkimus sosioemotionaalista erityistä tukea saavista lapsista päiväkotiryhmässä [Somehow difficult. An ethnographic study of*

- children with special socio-emotional needs in a day care group]. The University of Jyväskylä.
- Weitzman, C., Edmonds, D., Davagnino, J., & Briggs-Gowan, M. (2011). The association between parent worry and young children's social-emotional functioning. *Journal of Developmental & Behavioral Pediatrics, 32*(9), 660–667.
- Wichstrøm, L., Berg-Nielsen, T. S., Angold, A., LinkEgger, H., Solheim, E., & HamreSveen, T. (2012). Prevalence of psychiatric disorders in preschoolers. *Journal of Child Psychology and Psychiatry, 53*(6), 695–705. <https://doi.org/10.1111/j.1469-7610.2011.02514.x>Ó2011.
- Ylitapio-Mäntylä, O. (2012). Sukupuolittuneet käytännöt varhaiskasvatuksessa [Gendered Practices in Early Childhood Education]. In O. Ylitapio-Mäntylä (ed.) *Villit ja kiltit: tasa-arvoista kasvatusta tytöille ja pojille* (pp. 15–30). PS-kustannus.