

Risk Factors for Internalizing and Externalizing Problems in the Preschool Years: Systematic Literature Review Based on the Child Behavior Checklist 1½–5

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Published online: 9 June 2016
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Abstract Early childhood is a common period for the onset of internalizing and externalizing problems. Many are the risk factors that contribute to the emergence of these types of problems. Literature enhances the importance of viewing the child as part of a system, in order to better understand the origin, the trajectory and the impact of risk factors in child mental health in preschool age. The current systematic literature review aims to examine empirical evidence based on the Child Behavior Checklist 1½–5 for risk factors related to the presence of internalizing and externalizing problems in children aged between 3 and 6 years old. The literature review includes articles published from January 2001 to December 2014. Twenty-eight articles that attend to pre-established inclusion and exclusion criteria were reported throughout the review. In general, results indicate that risk factors for internalizing and externalizing problems in preschool age can be organized into three main groups of risks: environment factors, parental/parenting factors, and child factors. It is clear that frequently more than one risk related to the emergence of internalizing and externalizing problems in preschool age children are reported. It is also possible to note that are few risks factors consistently studied in this age, highlighting the need for further investigation.

Keywords Risk factors · Preschool age · CBCL 1½–5 · Internalizing problems · Externalizing problems

Introduction

There is growing awareness of the need for systematic and dimensional assessments of psychosocial functioning during preschool. Systematic assessments allow clinicians and researchers to gather information about child's functioning in different periods of time. By providing knowledge about the decreasing or increasing of symptoms, this type of assessment can help to improve the quality of services for children with psychopathological problems (Achenbach and Rescorla 2000; Achenbach 2009). Additionally, dimensional assessment of psychopathology presents several advantages, such as allowing the assessment of disorder severity, and subclinical presentations of disorders (Lebeau et al. 2012). This empirically based paradigm takes a *bottom up* approach, where syndromes are statistically derived in order to reflect patterns of problems that co-occur in large samples rated by different informants in the same or in different contexts (Rescorla 2005). The Achenbach System of Empirically Based Assessment (ASEBA) is the gold standard for the empirically based paradigm and captures similarities and differences in how children function under different conditions. One of the advantages of ASEBA is that all of the forms have well-documented reliability and validity in numerous countries and societies (Rescorla et al. 2011).

The Child Behavior Checklist 1½–5 (CBCL 1½–5; Achenbach and Rescorla 2000) is part of the ASEBA battery and it is used to assess symptoms of psychopathology in preschool-age children and to provide a dimensional perspective based on seven syndrome scales

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(emotionally reactive, anxious/depressed, somatic complaints, withdrawal, attention problems, aggressive behavior, and sleep problems). There are also five scales oriented to DSM classifications (affective problems, anxiety problems, pervasive developmental problems, attention deficit/hyperactivity problems, and oppositional defiance problems) and two second-order dimensions: internalizing problems (IP) and externalizing problems (EP). Factors under IP include syndromes concerning symptoms of anxiety, depression, withdrawal and somatic complaints that are essentially related to the child's subjective difficulties and problems. Factors under EP mainly include conflicts with others, including symptoms compatible with attention problems and aggressive behavior. The CBCL 1½–5 is completed by parents, parent surrogates, or others who observe children in home-like contexts. The informants rate 99 items, using a 0–2 scale, and provide a description of the child's behaviors, their greatest concerns about the child and the best things about the child. Multicultural studies revealed substantial consistency in CBCL 1½–5 mean scores across many societies despite great variations in geography, political/economic systems, size, population, ethnicity/race, and religion (Rescorla et al. 2011).

The existence of quality measures to assess psychopathology in preschool children is quite important, given that that early experience has a profound effect on human development, and this age is considered a critical development period, meaning that there is a window of opportunity for certain types of experiences to have a foundational effect on the development of skills or competencies (Fox and Rutter 2010). To date, there is disagreement in the literature concerning the risk factors that might cause psychopathology in preschool-age children (Ellis et al. 2012). Research in child psychiatry and psychology suggests that most children are exposed to a single physical or psychosocial risk factor during the first years of life and suffer little if any lasting harm from that exposure (Ogg et al. 2010). However, children who are exposed to multiple risk factors are much more likely to experience significant internalizing and externalizing problems (IEP). The cumulative risk approach has been useful in explaining socioemotional and health outcomes and it is well documented in literature that different domains of a child's life—such as familial, social, parental, biological or even prenatal factors—can influence the development of IEP (Evans et al. 2013).

The study of risk factors associated with IEP in preschool-age children has become increasingly relevant. Providing a deeper knowledge of the causes of disorders will contribute to the delineation of more efficient interventions, both preventive and remedial (Kovacs and Lopez-Duran 2010). The main goal of this systematic scientific review is to focus on IEP in preschool-age

children (between 3 and 6 years old) assessed by the CBCL 1½–5 and to identify associated risk factors.

Method

Search Strategy

Three electronic information databases (*Psycharticles and Psychology*, *Behavioral Sciences Collection* and *Medline*) were used to identify published articles on the topic. Unpublished research was not considered. The search strategy included the following terms: “Preschool age” OR “CBCL” OR “Risk Factors” AND (a) “Internalizing problems”; (b) “Externalizing problems”; (c) “Emotional problems”; (d) “Behavioral problems”. These combinations were used to identify risk factors in preschool-age children from studies using the CBCL 1½–5 as a measure for assessing behavioral and emotional problems. This combination of terms aimed to provide a wide range of results, not focusing on a specific type of risk factors (e.g., parental, biological), because our goal was to provide a global review of risk factors. After identifying relevant articles, longitudinal studies were identified and searched to evaluate whether they were associated to other relevant articles to be included in the review. The process was repeated by a second researcher.

Inclusion and Exclusion Criteria

All of the published empirical studies were searched and reviewed against the following inclusion criteria: (a) inclusion of the CBCL 1½–5, which allows for a reliable assessment of the frequency and intensity of clinically relevant IEP and provides dimensional data of a child's mental health problems; (b) empirical studies; (c) published between 2001 and 2014—CBCL 1½–5 only was available in 2000, and (d) written in English. Articles were excluded when (a) clinical samples were used—only the general population was of interest; (b) samples included children with physical disabilities—decreasing the possibility of an over-representation of symptoms that could be secondary to a physical handicap; (c) studies included children who were institutionalized or adopted—research indicates that institutionalized children are usually deprived of parental care (Ghera et al. 2008); (d) studies used prior versions of the CBCL; and (e) studies used a sample less than 100 participants—studies that use larger sample sizes have a better statistical power, as larger samples will allow a better statistical power to enhance the possibility of generalization of results (Westfall et al. 2014). Only IEP assessed by the CBCL 1½–5 were reported, even if additional measures were used to assess psychopathology.

The preliminary search identified 10,643 articles, but 7434 were duplicates. The remaining 3209 studies were examined. Ten additional records (from longitudinal studies) were found, but only 3 were included due to the inclusion and exclusion criteria. In total 28 articles were included in the review. The process of reviewing and eliminating non-relevant articles followed PRISMA guidelines and is shown in Fig. 1 (Moher et al. 2009).

The 28 studies that met our inclusion criteria are listed in chronological order in Table 1.

Results

Most studies (71.43 %) included in this systematic review had a longitudinal design, 17.86 % were cross-sectional studies, and 10.71 % were cohort studies.

The 28 studies included in the present review allowed the identification of many risk factors that have been studied as related to IEP in preschool aged children.

Table 2 reports all risk factors that were found indicating the articles and what the direction of results; however, only risk factors reported in three or more articles were considered in the results' section. The most studied risks can be divided into three categories: risks in the family and social context, risks involving the parents, and risks related to the child (Zeanah et al. 1997). Therefore, the most consistent risk factors identified in the articles were organized according to three main categories of risk: (a) environmental; (b) parental mental health/parenting factors; and (c) child. Throughout the review, significant and non-significant results are presented.

Environmental Risk Factors

Demographic Factors

Socioeconomic Status Several studies indicate that socioeconomic status (SES) is highly associated with disturbance in preschool-age children (c.f. Ronan et al. 2009;

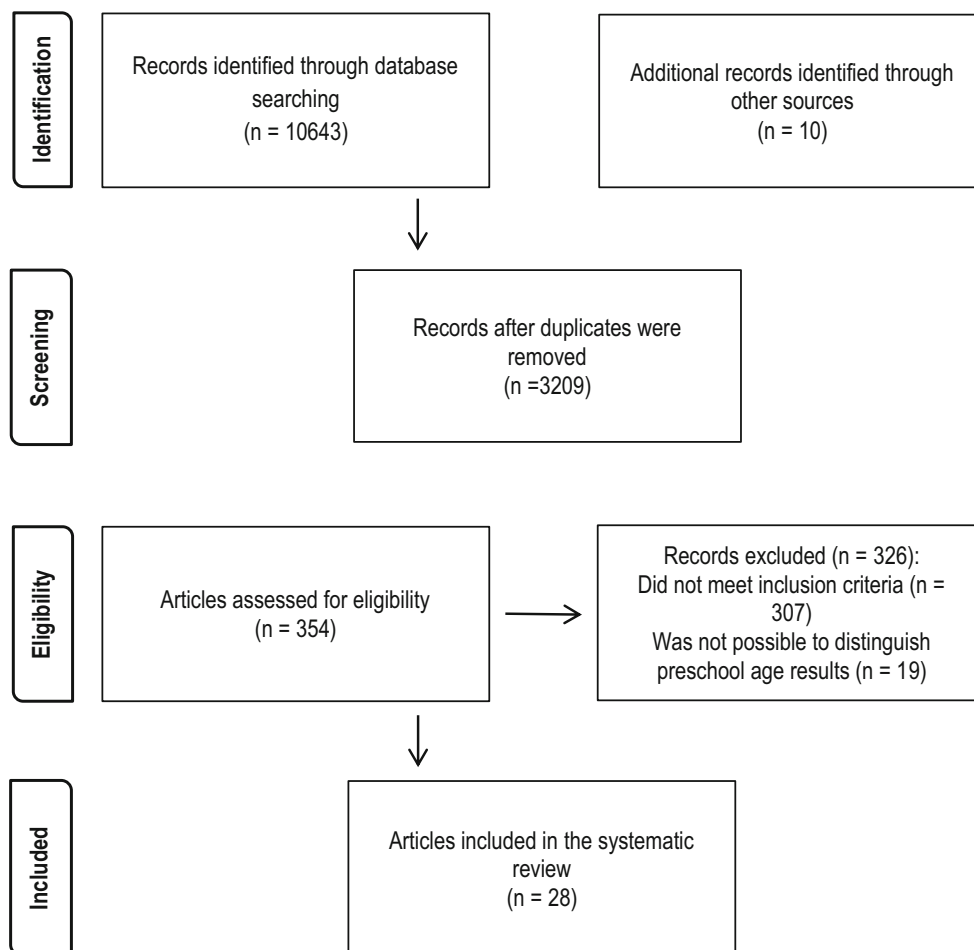


Fig. 1 PRISMA flowchart

Table 1 Studies included in the systematic literature review

Study	Country	N (%Male)	Type of study	Analysis
Mistry et al. (2007)	USA	2702 (49 %)	Longitudinal	Correlations
Bayer et al. (2008)	Australia	488 (51.4 %)	Longitudinal	Regression analysis
Chartrand et al. (2008)	USA	169	Cross-sectional	<i>t</i> test
Paterson et al. (2008)	New Zealand	709 (65.3 %)	Longitudinal	GEE
Trentacosta et al. (2008)	USA	731 (51 %)	Cross-sectional	Correlations
Herba et al. (2010)	Netherlands	743 (51.1 %)	Longitudinal	Regression analysis
Poehlmann et al. (2010)	USA	172 (53 %)	Longitudinal	Regression analysis
Gleason et al. (2011)	Romania	350	Cross-sectional	t-test
Henrichs et al. (2013)	Netherlands	5497 (49.8 %)	Longitudinal	Regression analysis ANCOVA
Utendale and Hastings (2011)	USA	115 (42.6 %)	Longitudinal	Correlations Bivariate analysis Regression analysis
Velders et al. (2011)	Netherlands	2698 (50.1 %)	Longitudinal	Correlations Bivariate analysis
Bayer et al. (2012)	Australia	397 (52.4 %)	Longitudinal	Latent class analysis
Ezpeleta et al. (2012)	Spain	622 (50 %)	Longitudinal	Correlations
Kersten-Alvarez et al. (2012)	Netherlands	142 (57.7 %)	Longitudinal	Correlations
Liles et al. (2012)	USA	212 (53.8 %)	Longitudinal	t-test
Poehlmann et al. (2012)	USA	230	Longitudinal	Regression analysis
Steenweg-de Graaff et al. (2012)	Netherlands	3209 (48.7 %)	Longitudinal	Univariate analysis
Verlinden et al. (2012)	Netherlands	3761	Longitudinal	Regression analysis
LaGasse et al. (2013)	USA	330 (51.5 %)	Cross-sectional	Correlations t-test
Liu et al. (2013)	China	1385	Cohort	t-test
Paterson et al. (2013)	New Zealand	1047 (51 %)	Cohort	Correlations
Twomey et al. (2013)	USA	214 (52 %)	Longitudinal	Correlations
van Battenburg-Eddes et al. (2013)	Netherlands	2280	Longitudinal	Correlations
Ciciolla et al. (2014)	USA	250 (50.7 %)	Cross-sectional	Correlations
Liu et al. (2014a)	China	1372 (55 %)	Cohort	Correlations Regression analysis
Liu et al. (2014b)	China	1341 (55 %)	Longitudinal	Correlations
Knudsen et al. (2014)	Norway	46,756 (51 %)	Longitudinal	Correlations
Steenweg-de Graaff et al. (2014)	Netherlands	3104 (50.5 %)	Longitudinal	Correlations

Gleason et al. 2011). In the review, four studies examined the role of SES on IEP. One study (Gleason et al. 2011) indicated that low income increases IEP and two studies (Paterson et al. 2013; Ciciolla et al. 2014) reported that low SES increases EP. Only one study (Utendale and Hastings 2011) stated that SES does not have an influence on IEP. The study conducted with the larger and most representative sample (Paterson et al. 2013), aimed to understand the relationship between child behavior and sociodemographic variables, such as SES. The other three studies report the effect of SES as a minor result, and the study with the smallest sample was the only one to report no significant results.

Parental Education and Age The effect of maternal characteristics such as education and age on child outcomes has been widely considered in the literature. Three studies (Gleason et al. 2011; Velders et al. 2011; Liu et al. 2014a) examined the effect of parental education on child's IEP. In two studies (Velders et al. 2011; Liu et al. 2014a) low maternal education is related to increases in IEP, and one found no significant results on IEP (Gleason et al. 2011). Only one study (Gleason et al. 2011) assessed the effect of paternal low education, finding significant results indicating that when the fathers have a low education level, children tend to present more IEP. In the three studies mothers have a similar education distribution, and almost

Table 2 Risk factors and direction of results

Risk factors	Direction of results	Studies
Environmental risk factors		
Demographic factors		
SES	Low SES increases IEP in 1/2 studies Low SES increases EP in 2/2 studies	Gleason et al. (2011), Utendale and Hastings (2011), Paterson et al. (2013), Ciciolla et al. (2014)
Maternal age	Being a younger mother increases IEP in 3/4 studies	Gleason et al. (2011), Velders et al. (2011), LaGasse et al. (2013), Twomey et al. (2013)
Parental education	Paternal low education increases IEP in 1/1 studies Maternal low education increases IEP in 2/3 studies	Gleason et al. (2011), Velders et al. (2011), Liu et al. (2014a)
Parental mental health/parenting factors		
Substance abuse	Pre-pregnancy risk drinking increases IEP in 1/1 studies Methamphetamine use during pregnancy increases IEP in 1/1 studies Methamphetamine use during pregnancy increases EP in 1/2 studies Environmental tobacco exposure during pregnancy increases IEP in 1/1 studies Maternal smoking increases IP in 1/1 studies	Liles et al. (2012), LaGasse et al. (2013), Liu et al. (2013), Paterson et al. (2013), Twomey et al. (2013), Knudsen et al. (2014)
Maternal/father/parental/familial mental health	Parental prenatal and postnatal depression increase IEP in 2/2 studies Parental prenatal and postnatal hostility increase IEP in 1/1 studies Parental prenatal anxiety increases IEP in 1/1 studies Post-Partum Depression increases EP in 1/1 studies Maternal stress increases IEP in 1/1 studies, and IP in 1/1 studies Maternal depression, but not anxiety, increases IEP in 2/3 studies History of psychiatric disorder in the family increase IEP in 1/1 studies	Bayer et al. (2008), Poehlmann et al. (2010), Gleason et al. (2011), Velders et al. (2011), Bayer et al. (2012), Kersten-Alvarez et al. (2012), LaGasse et al. (2013), Paterson et al. (2013), Twomey et al. (2013), van Battenburg-Eddes et al. (2013)
Disciplinary practices/parental interactions	Harsh discipline increases IEP in 2/2 studies, and EP in 1/1 studies Low nurturance increase IP in 1/1 studies, but not IEP in 2/2 studies Intrusive interactions does not increase IEP in 1/1 studies Frustrated interactions does not increase IEP in 1/1 studies Low developmental stimulation increases IEP in 1/1 studies Low emotional responsiveness increases IEP in 1/1 studies Less sensitive parenting increases IEP in 1/1 studies Low quality parenting interactions increases IP, but not EP in 1/1 studies Parenting stress increases IP in 2/2 studies	Bayer et al. (2008), Poehlmann et al. (2010), Bayer et al. (2012), Poehlmann et al. (2012), Paterson et al. (2013), Twomey et al. (2013), Ciciolla et al. (2014)
Expectations/concerns about the child	Inappropriate expectations does not increase IEP in 1/1 studies Inappropriate developmental expectations increases IP in 1/1 studies Parental concern about mental health increases IEP in 1/1 studies	Bayer et al. (2008), Gleason et al. (2011), Bayer et al. (2012)
Child risk factors		
Child sex	Being a boy increases EP in 3/3 studies, and IP in 1/1 studies Being a boy or a girl does not increase IEP in 1/1 studies	Gleason et al. (2011), Henrichs et al. (2013), Utendale and Hastings (2011), LaGasse et al. (2013)

Table 2 continued

Risk factors	Direction of results	Studies
Temperament	Effortful control does not increase EP in 1/1 studies Low inhibitory control increase EP in 1/1 studies Irritability increases IP in 1/1 studies Negative affect increases IEP in 1/1 studies Anger increases EP in 1/1 studies Slow soothability increases EP in 1/1 studies Low emotional control increases EP in 1/1 studies	Poehlmann et al. (2010), Utendale and Hastings (2011), Ezepeleta et al. (2012)
Non discussed findings		
Acculturation	Acculturation does not increase IEP in 1/1 studies	Paterson et al. (2013)
Basal vagal tone	Higher basal vagal tone increases EP, but not IP, in 1/1 studies	Poehlmann et al. (2012)
Birth weight	Low birth weight increases IEP in 1/1 studies	Velders et al. (2011)
Blood lead concentration	Blood lead concentrations does not increase IEP in 1/1 studies	Liu et al. (2014b)
Cumulative risk	Exposure to multiple risks (Cumulative risk composite: overcrowding, single parent, neighborhood, parental age, criminal conviction, drug/alcohol problem) increases IEP in 1/1 studies	Trentacosta et al. (2008)
Diet	Mediterranean diet increases EP, but not IP, in 1/1 studies Traditionally Dutch diet increases EP, but not IP, in 1/1 studies	Steenweg-de Graaff et al. (2014)
Family functioning	Parental prenatal family disfunctioning increases IEP in 1/1 studies	Velders et al. (2011)
Firstborn	Being firstborn increases IEP in 1/1 studies	Velders et al. (2011)
Ganglionic characteristics	Ganglionic ovoid diameter increases IP, but not EP, in 1/1 studies	Herba et al. (2010)
Household	Larger households increase EP in 1/1 studies	Paterson et al. (2013)
Iron status	Low iron status does not increase IEP in 1/1 studies	Liu et al. (2014a)
Suburbs	Live in the suburbs increases IEP in 1/1 studies	Liu et al. (2014a)
Maternal marital status	Being a single mother increases IP in 1/1 studies	Paterson et al. (2013)
Maternal plasma folate concentration	Low concentrations of maternal plasma folate concentration does not increase IEP in 1/1 studies Folate deficiency during pregnancy increases IEP in 1/1 studies Inadequate folic acid supplement use increases IEP in 1/1 studies Homocysteine does not increase IEP in 1/1 studies	Steenweg-de Graaff et al. (2012)
Parental professional status	Deployed parent does not increase IEP in 1/1 studies	Chartrand et al. (2008)
Ventricular characteristics	Ventricular volume increases IP measured in fathers report, but not in mothers, in 1/1 studies Ventricular volume does not increase EP measured in mothers or fathers report in 1/1 studies	Herba et al. (2010)
Vocabulary development	Expressive vocabulary delay increases IEP measured in mothers report, but not in fathers, in 1/1 studies Receptive language delay does not increase IEP in 1/1 studies	Henrichs et al. (2013)
TV	Having a TV on the bedroom increases IEP in 1/1 studies Sustained exposure increases EP in 1/1 studies Exposure to TV only 1 h per day does not increase EP in 1/1 studies Unsuitable TV exposure does not increase EP in 1/1 studies High TV exposure increases EP in 1/1 studies	Mistry et al. (2007), Verlinden et al. (2012)
Violence exposure	Severe physical intrapartner violence perpetration increases IEP in 2/2 studies	Paterson et al. (2008), Paterson et al. (2013)

half of the mothers have a low education. The study with the smallest sample ($n = 350$) is the only one that found non-significant results. It is probably due to the sample size that differences were not found, which is concordant with the idea that the larger samples allow the identification of effects, even if they are minor.

Three (Velders et al. 2011; LaGasse et al. 2013; Twomey et al. 2013) of the studies that surveyed the influence of maternal age found significant differences between younger and older mothers—younger mothers report more IEP than the older ones. Only one study (Gleason et al. 2011) found no significant results. The mean age is very similar in all studies, ranging from 25 to 30 years. Gleason et al. (2011) study, although presenting non-significant results, does not have a small sample and uses similar statistical analysis to other studies, which may indicate that differences between this and the other three studies can be due to characteristics of the sample and not to statistical power of analysis.

Moreover, it is relevant to notice that the non-significant results on maternal education and age are provided by the same study (Gleason et al. 2011), and they were reported as minor results in the article.

These two factors reported above may influence and enhance the odds of these children to have more IEP than others and also statistical differences can more easily be found; however, in the literature it is well stated that low maternal education and young age are variables associated with a lower SES. These mothers are typically under significant stress due to other variables such as unemployment or housing conditions, leading to a low SES that has already been associated with many other risks.

Parental Mental Health/Parenting Factors

Substance Abuse

Studies related to substance abuse found that pre-pregnancy risk drinking (Knudsen et al. 2014) increased IEP, methamphetamine use during pregnancy increases IEP (LaGasse et al. 2013) and EP (Twomey et al. 2013), tobacco exposure during pregnancy (Liu et al. 2013) and maternal smoking during child preschool years increases IEP (Paterson et al. 2013). One study reported non-significant results to the effect of methamphetamine exposure during pregnancy in EP (Liles et al. 2012). Results evidence the robustness of the effect of substance abuse, especially during pregnancy, to the development of IEP.

The unique study that account for non-significant results is the one with the smallest sample, however it shares the sample with LaGasse et al. (2013) and Twomey et al. (2013) studies, given that they are from the same longitudinal study and have a similar number of participants in the

analyses. Perchance differences among these three studies are due to the fact that they do not use the same exact participants. For instance in the study of Twomey et al. (2013) the sample is constituted by mothers of children aged 5 years old. The sample of LaGasse et al. (2013) ($n = 330$) is larger than the sample of Liles et al. (2012) ($n = 212$), enhancing the possibilities to find significant results. All the other studies used very large samples, ranging from 1385 to 46,756, evidencing the strength of the results.

These findings should be analyzed in the context of maternal functioning as maternal substance abuse and maternal psychological difficulties coexist in many cases and it may be difficult to ascertain their relative influence on IEP. For example, one study found that the co-occurrence of maternal drug use and psychological distress may further compromise overall behavioral health and parenting behavior (Accornero et al. 2002). Drug-using mothers in the study also suffered from psychological distress, and this may have a more negative influence on child behavior than drug-using mothers not experiencing psychological distress.

Maternal/Paternal/Parental/Familial Mental Health

Maternal psychopathology, particularly depression, has been extensively studied and is considered a major influence in the development of IEP in preschool-age children. Almost all of the studies that aimed to examine the contribution of caregiver's mental health found significant associations between the presence of symptoms and IEP.

Parental prenatal and postnatal depression was associated with IEP (Velders et al. 2011; van Battenburg-Eddes et al. 2013), and the same was observed with hostility (Velders et al. 2011). In the case of anxiety, only prenatal anxiety was related to IEP (van Battenburg-Eddes et al. 2013). Results also indicated that Post-Partum Depression (PPD) increased the odds of EP (Kersten-Alvarez et al. 2012). Besides prenatal and postnatal assessments, others studies examined the role of psychological symptoms during preschool years, where maternal depression increases IEP (Poehlmann et al. 2010; Paterson et al. 2013)—except in one study (Bayer et al. 2008); and maternal stress increases IP (Bayer et al. 2012). Two studies found that history of psychiatric disorder in the family increased IEP (Gleason et al. 2011).

The psychological functioning of the caregiver is a variable of high importance. When psychological functioning is compromised mothers and fathers tend to be less supportive to their children as well as less capable of teaching their child to regulate his/her emotions. Parents with a poor psychological functioning can also over-

identify child's IEP, reporting problems where they do not exist. Throughout the studies, mental health is a very consistent and robust variable and significant results were found in large but also in small samples. For instance, there was one study (Kersten-Alvarez et al. 2012) that used two groups, one with children from a community with 113 children and no history of PPD, and other group of mothers with PPD ($n = 29$), and even with this large difference between the groups, it was found that children from mothers with PPD present more EP in preschool, evidencing the long lasting effects of maternal psychological functioning on child's impairment.

Maternal psychopathology and stress are important variables to study as mothers prone to psychopathology may be more likely to feel "out of control" and thus less available to help their child regulating negative emotions. One possible conceptual explanation is that mothers may adopt passive emotional coping strategies and thus fail to model appropriate emotional regulatory strategies. It is important to note that there are studies where maternal locus of control is associated with a child's IP, even when controlling for maternal level of education, child age, and whether mothers completed the questionnaire at school or at home (c.f. Coyne and Thompson 2011).

In sum, during pregnancy and neonatal period, the parents' mental health, and specifically maternal mental health, is extremely important to consider in family functioning, as it interferes with daily interactions and contextual factors. For example, in families with a depressed parent, the interaction between spouses is often characterized by increased hostility and tension. This situation may lead the family to report poor family functioning more frequently than families with no depressed parents do. Therefore, children in these families are in an increased risk of IEP, not only because they have a parent with mental health problems but also because of the increased likelihood of exposure to marital conflict and poor family functioning (Hughes and Gullone 2008).

Disciplinary Practices/Parental Interaction

In what concerns to disciplinary practices and parental interactions, results are not as consistent as they are in other variables. Harsh discipline and low nurturance were examined in the same studies. On one hand, harsh discipline was related to the development of IEP (Bayer et al. 2008; Bayer et al. 2012) and EP (Paterson et al. 2013), and on the other hand, low nurturance was associated to IP (Bayer et al. 2012), but not to IEP (Bayer et al. 2008; Bayer et al. 2012). Although one of the studies (Bayer et al. 2008), reporting significant and non-significant results, includes a large number of participants, it is a cohort study of a specific population—Pacific Islands-, which may not

represent populations around the world. The other two articles are from Australia and report data from longitudinal studies. Australia culture is more proximal to the culture of many countries which enhances the possibility to compare results. The study of the Pacific Islands has a large sample ($n = 1047$), and one of the requests to parents participating in the study was that one of the parents at least should be identified as being of Pacific Islands ethnicity and a permanent resident, which, by itself, represents some bias in the generalization of the results to other ethnicities or geographic areas where there are many ethnicities and cultural differences.

One study (Poehlmann et al. 2012) indicated that intrusive and frustrated interactions between parents and children do not increase IEP, but the same study reported that low developmental stimulation (Poehlmann et al. 2012) is associated with IEP. Other studies stated that low emotional stimulation (Twomey et al. 2013) and less sensitive parenting (Ciciolla et al. 2014) increase the odds of children developing IEP. In addition one study reported that low quality of parenting increases IP, but not EP (Poehlmann et al. 2010), and two studies (Twomey et al. 2013; Ciciolla et al. 2014) indicated that parenting stress increases IP. Attending to all of these results one can hypothesize that it is not parenting *per se* that can influence child's outcomes. For example, in some studies other variables have to be considered, such as maternal substance abuse (Twomey et al. 2013), child developmental delay (Ciciolla et al. 2014), and preterm birth (Poehlmann et al. 2010). It is important to attend to other variables because they can be specific of the samples used in the studies and consequently influence the results.

Apart from findings and specific characteristics of the samples used, negative parenting practices have been consistently documented as being related to EP, but they have been less frequently examined as predictors of IP. Parenting strategies that increase the reciprocity between disciplinary practices, such as harsh discipline and IEP are troublesome as these types of practices usually lead to an environment that is driven by non-effective communication of a child's needs and by parents' rules.

Expectations/Concerns About the Child

One study (Bayer et al. 2008) reported that parents' inappropriate expectations of a child between 24 and 36 months old are not related to IEP. However, another study (Bayer et al. 2012) found that inappropriate developmental expectations of children from 24 to 36 months and from 36 months to 5 years old are related to increases in IP, but not EP. These two articles, even though they are part of the same longitudinal study, report different number of participants, which can help to explain different results. However, it is also important to note

that in Bayer et al. (2012) study, inappropriate developmental expectations included two time periods. Perhaps those parents who have some notion of what is expected from their children at different ages tend to have more expectations for their own children than other adults might have—parents might expect, for example, better behavior from their own children, when compared to other children.

One last study (Gleason et al. 2011) found that parental concern about the child mental health increases IEP. It is important to notice that sometimes parents over-report child's problems because they are not aware of children's normal development and that some problems are normative in some ages (e.g. temper tantrums at 2–3 years of age). Furthermore, in some cases parents are influenced by their negative evaluation of situations or their tendency to focus only in what is negative. It would have been important, for example, in this study, to assess the knowledge of parents about children's normal development.

Child Risk Factors

Child Sex

Four studies (Gleason et al. 2011; Henrichs et al. 2013; Utendale and Hastings 2011; LaGasse et al. 2013) examined children's gender and its association with IEP. Three studies (Gleason et al. 2011; Henrichs et al. 2013; LaGasse et al. 2013) indicated that boys present more EP than girls, and one study (LaGasse et al. 2013) referred that boys have more IP than girls. Only one study (Utendale and Hastings 2011) found non-significant results to IEP. The study that found non-significant results has the smallest sample and half of the sample is constituted by girls, which may be hiding sex differences.

Although sex differences were fairly consistent they were quite small. The differences found between boys and girls are relatively easy to interpret. Young children exhibit sex differences in traits that may be relevant to the development of disruptive behavior disorders. Boys exhibit lower levels of effortful control (i.e., deliberate control including attention focusing and shifting) and higher levels of surgency (i.e., high-intensity pleasure, activity, and sociability) when compared to girls (Else-Quest et al. 2006). Boys tend to play more physical games than girls and tend to solve their problems using aggression; by contrast, girls tend to be sad and might not tell anybody. However, sex differences are not a major result of the studies, and there are few studies controlling for this effect when community samples are used (Ruiter et al. 2007).

Temperament

Temperament, and specifically, inhibitory control, irritability, negative affect, anger, slow soothability and

emotional control were shown to be relevant risk factors for the development of IEP. Low inhibitory control (Utendale and Hastings 2011), anger (Ezpeleta et al. 2012), slow soothability (Ezpeleta et al. 2012) and low emotional (Ezpeleta et al. 2012) control are associated to increases in EP, and irritability (Ezpeleta et al. 2012) and negative affect (Ezpeleta et al. 2012) are related to the presence of IP and IEP, respectively. The only dimension of temperament that is not linked to IEP, namely to EP, is effortful control (Poehlmann et al. 2010).

From the three studies, the most robust is the one which contributes the most (Ezpeleta et al. 2012), regarding the number of significant results, to the literature about the influence of temperament in IEP. This study is the one with the larger sample and participants are part of a longitudinal study. Two of the studies (Utendale and Hastings 2011; Ezpeleta et al. 2012) used the Child Behavior Questionnaire (CBQ; Rothbart et al. 2001) to assess temperament dimensions. The other study (Poehlmann et al. 2010) used an observational measure where five components of effortful control were analyzed: ability to delay, suppressing-initiating activity to signal, effortful attention, slowing motor activity, and lowering voice, but no other study assessed effortful control, therefore not allowing the comparison of the quality and robustness of all the results. Nevertheless, it would be quite interesting to assess inhibitory control, irritability, negative affect, anger, slow soothability and emotional control with observational measures in the samples that were studied in order to examine the direction and significance of the results.

Discussion

It is of primary importance to study the risk factors that are associated with IEP, especially in children of preschool age. This period of development is highly sensitive to changes and to the impact of negative situations/events. Thus, the main goal of this systematic review was to identify risk factors for the development of IEP in preschool-age children as assessed with the CBCL 1½–5. Twenty-eight articles were included in the review.

When a single risk factor is studied, it is quite difficult to find homogeneity in the literature. For instance, when SES is reported, usually it is indirectly influenced by other variables, such as unemployment or social support that have both direct and indirect influence in the development of IEP in children. When considering low SES other risks should also be attended, such as quality of home environment, including violence in the family, conflicts between family members, presence of the father, the number of siblings and birth order. These evidences should be understood in a comprehensive manner, as they are usually

influenced by other variables. When the mother is single or the biological father is absent, the mother experiences higher levels of parental stress that will influence her relationship with the child, perhaps because the mother does not have the same spousal support that partnered mothers do. It is easily assumed that while single motherhood has an impact on a child's IEP, other variables are indirectly associated as well. This idea turns our attention to risk composites. The literature reflects the strong correlation between the presence of multiple risks and IEP, as shown in Trentacosta et al. (2008), where cumulative risk composite (teen parent, low education, single parent, overcrowding, criminal conviction, drug/alcohol problem, dangerous neighborhood) was correlated to IEP, but scores yielded very small and largely insignificant results.

Regarding maternal characteristics, such as education level or age it is also relevant to consider other risks, such as substance abuse and maternal psychopathology. It is well accepted that mothers who abuse substances tend to have children who exhibit more symptoms of IEP. Maternal psychopathology, and specifically maternal depressive and anxious symptomology, is one of the best-studied risks. Still, it is important to understand whether children truly have a higher instance of IEP or if biased maternal perception, influenced by psychopathological symptoms, leads mothers to report problems that do not actually exist (NICHD 1999). Our review shows that maternal risk factors are thought to be directly linked to parenting by decreasing positive parenting behaviors (e.g., sensitivity) and increasing negative behaviors (e.g., harsh parenting). In Cabrera et al. (2011), maternal risk (e.g., depression) was directly linked to the quality of mother–child interactions, and the presented results indicated that harsh disciplinary practices, critical parenting and uninvolved parenting all influence child development in relation to IEP.

The impact of child characteristics such as sex seems to have a significant influence on IEP. When sex differences are reported, usually more problems are found in boys than in girls, particularly with EP. The impact of child characteristics on IEP could be related to social demands emerging during the preschool period, when this set of skills is relevant for engaging in adaptive relations with peers and adults. Children presenting difficulties in this area may not be successful in problem-solving situations.

Temperament is one characteristic that requires further study, especially using observational measures. In some studies, temperament is associated with IEP, but it can also be a moderator between other risks (e.g., contextual, maternal) and IEP (c.f. Poehlmann et al. 2012). This is consistent with Belsky's (1997) differential susceptibility hypothesis, which argues that the environment affects children differently depending on their temperament. It is

well known that reactive children, sometimes described as "difficult," can be intensely distressed and hard to soothe and may have IEP.

The presence of a single risk factor rarely occurred in the articles reviewed. In most studies, two or more risk factors were present, which supports a cumulative risk approach to understanding the development of psychopathology, which is in line with the idea that cumulative risk is harmful and contributes more to the development of IEP when compared to the effect of a single risk (Evans et al. 2013; Ogg et al. 2010).

This literature review highlights the need for an integrative approach—combining developmental psychopathology and a family-system approach—to research on risk factors for preschool-age psychopathology, with potential implications on clinical assessments of children in that age group (Mash and Hunsley 2007). Children have their own individual characteristics (e.g., temperament); they live, in most cases, with their biological families and they are integrated in a community. Risk factors for IEP can be more distal (e.g., ethnicity) or proximal (e.g., maternal psychopathology), and can influence one other (e.g., relation between SES and low maternal education), often leading to a snowball effect that increases the probability of non-adaptive developmental trajectories. Thus a comprehensive and integrative approach to children's psychosocial development not only enhances the quality of problem analysis and understanding but also contributes to better case formulations, as well as an earlier intervention to multiple problems. As risks are identified and their influence is reduced, the chance of children presenting normative developmental trajectories and not developing IEP increases. Taking this in consideration, interventions in community and family settings should occur as early as possible, should focus on the different risk factors assessed, and contribute to a positive and protective effect on children's development.

Finally, in this systematic review we choose to study risk factors as single factors and not as composites of risk, which can be considered a limitation. Indeed, risk factors tend to co-occur or interact, and for that reason, research on risk factors frequently considers multiple domains of risk. For example, one of the included studies (Trentacosta et al. 2008) found that a cumulative risk was correlated to IEP at age 4. Other study, Bennett et al. (2002), in a sample of 223 children (113 boys) from a longitudinal study, also used a risk factor composite (maternal life stress, maternal social support network size, number of regular caregivers, regularity of child's schedule, stability of child's surroundings, single parent household, maternal race, maternal education, and public assistance status) to predict EP. In the same line, a recent study of Watamura et al. (2011), using a sample of 178 children

(87 boys) from a longitudinal study, found that children who experienced the double jeopardy of a poor quality home and a poor childcare environment presented higher scores of IEP than other children, when controlling for stable background characteristics and home and child care history. However, when family and childcare variables (e.g., family structure) were added to the model, these children no longer differed from the others.

In the review, we did not use a scale to assess the quality of the studies as our aim was to provide information on what has been studied and what variables seem to be most common, independently of the study characteristics. Still, articles with less than 100 participants and using other measures than CBCL 1½–5 for assessing psychopathology were excluded. Thus, the quality of the results was enhanced, by reporting findings from larger studies and focusing the assessment on one of the most robust and current measures.

Reporting the results from these 28 studies allows us to draw some conclusions about methodological features and suggest recommendations to strengthen future research. Not all studies present the same methodological quality, probably due to: (1) their aims—which influence the number of participants and the type of analysis, and (2) the variables that were studied—some of which are more difficult to study because not all participants are available to provide information (e.g., substance abuse). Consequently, some methodological issues should be discussed and analyzed in order to provide the reader some ideas to keep in mind when reviewing the studies.

In five studies, information about the child's sex was not available. It is relevant to note that girls and boys are different in their patterns of functioning, and most studies cite differences in IEP between girls and boys. In some studies, with comparison groups, it was not possible to understand whether the groups were matched according to the children's age and sex. It is also relevant to note that when comparison groups are used they do not always have equal numbers of participants, which can bias the results and conclusions. Although there is a large variance in sample size (min = 115; max = 46,756), it is possible to confirm the influence of some risk factors for the development of IEP. Large samples allow researchers to achieve better statistical power enhancing the possibility of generalization of results (Westfall et al. 2014).

Some of the risk factors found in this literature review (e.g., sex, SES, disciplinary practices) were reported in different samples from different cultures, leading us to believe that they have a strong effect on development. Nevertheless, samples' specificities need to be weighted when generalizing results. Inconsistencies found in the results can be a result of how risk was assessed, of informants' values and perceptions, or even of culture

characteristics and culturally accepted behaviors (Gross et al. 2006).

Most of the studies followed a longitudinal design. Typical longitudinal studies focus on change processes over months or years, and there is general agreement that longitudinal data are necessary to approach questions regarding developmental and age-related changes within individuals (Rast and Hofer 2014). Thus, the influence of risk factors can be better understood when there is a starting point of assessment (e.g., a few months before birth) and when the influence of risk factors is reassessed from time to time (e.g., every 6 months). No studies that assessed maternal postnatal psychopathology reported maternal psychopathological symptoms prior to pregnancy and throughout the years, or examined the impact of the continuity of maternal depressive symptoms on child development. In most studies, demographic characteristics were assessed using questionnaires administered to or interviews with mothers. In some cases, mothers may hide difficult situations (e.g., conflicts with a partner, domestic violence to the child) that can have an effect on the development of IEP. Few studies used observational measures, and the ones that did it used them to assess maternal interactions with the child or lab observations during tasks.

Future Research

The present systematic review provides useful and practical information on risk factors for the development of IEP. It is possible to conclude that a wide range of risk factors influence IEP, but it is important to note that many of them act as small interferences in development and have a higher impact when conjugated with other risks, which is in line with the cumulative risk approach. Future studies should attempt to control for important variables that do not have a consistent pattern of influence on IEP.

When comparison groups are used, researchers should strive to have groups that are very similar in some characteristics, such as child age, child sex, and SES, and most importantly to have a similar number of participants in each sample. Otherwise, results may be compromised by simple questions related to the validity and reliability of the analysis. It would also be important to perform studies using observational measures, as they provide significant information that is not possible to collect using questionnaires (e.g., a child's interaction with peers).

Finally, biological and genetic studies are more commonly used today; however, more studies should be conducted to explore additional possible interactions between biological and genetic characteristics and contextual and parental factors during preschool age and their impact on IEP.

Acknowledgments This work has been supported by Fundação para a Ciência e a Tecnologia with the grant SFRH/BD/82020/2011.

References

- Accornero, V., Morrow, C., Bandstra, E., Johnson, A., & Anthony, J. (2002). Behavioral outcome of preschoolers exposed prenatally to cocaine: Role of maternal behavioral health. *Journal of Pediatric Psychology*, *27*, 259–269. doi:10.1093/jpepsy/27.3.259.
- Achenbach, T., & Rescorla, L. (2000). *Manual for the ASEBA preschool forms & profiles*. Burlington, VT: University of Vermont, Research Center for Children, Youth, & Families.
- Achenbach, T. (2009). *The achenbach system of empirically based assessment (ASEBA): Development, findings, theory, and applications*. Burlington, VT: University of Vermont Research Center for Children, Youth, & Families.
- Bayer, J., Hiscock, H., Ukoumunne, O., Price, A., & Wake, M. (2008). Early childhood aetiology of mental health problems: A longitudinal population-based study. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *49*, 1166–1174. doi:10.1111/j.1469-7610.2008.01943.x.
- Bayer, J., Ukoumunne, O., Mathers, M., Wake, M., Abdi, N., & Hiscock, H. (2012). Development of children's internalising and externalising problems from infancy to five years of age. *The Australian and New Zealand Journal of Psychiatry*, *46*, 659–668. doi:10.1177/0004867412450076.
- Belsky, J. (1997). Variation in susceptibility to rearing influence: An evolutionary argument. *Psychological Inquiry*, *8*, 182–186. doi:10.1207/s15327965pli0803_3.
- Bennett, D. S., Bendersky, M., & Lewis, M. (2002). Children's intellectual and emotional-behavioral adjustment at 4 years as a function of cocaine exposure, maternal characteristics, and environmental risk. *Developmental Psychology*, *38*, 648–658. doi:10.1037//0012-1649.38.5.648.
- Cabrera, N., Fagan, J., Wight, V., & Schadler, C. (2011). Influence of mother-father, and child risk on parenting and children's cognitive and social behaviors. *Child Development*, *82*(6), 1985–2005. doi:10.1111/j.1467-8624.2011.01667.x.
- Chartrand, M., Frank, D., White, L., & Shope, T. (2008). Effect of parents' wartime deployment on the behavior of young children in military families. *Archives of Pediatrics and Adolescent Medicine*, *162*, 1009–1014. doi:10.1001/archpedi.162.11.1009.
- Ciciolla, L., Gerstein, E., & Crnic, K. (2014). Reciprocity among maternal distress, child behavior, and parenting: Transactional processes and early childhood risk. *Journal of Clinical Child and Adolescent Psychology*, *43*, 751–764. doi:10.1080/15374416.2013.812038.
- Coyne, L., & Thompson, A. (2011). Maternal depression, locus of control, and emotion regulatory strategy as predictors of preschoolers' internalizing problems. *Journal of Child and Family Studies*, *20*, 873–883. doi:10.1007/s10826-011-9455-2.
- Ellis, L., Berg-Nielsen, T., Lydersen, S., & Wichstrom, L. (2012). Smoking during pregnancy and psychiatric disorders in preschoolers. *European Child and Adolescent Psychiatry*, *21*, 635–644. doi:10.1007/s00787-012-0300-y.
- Else-Quest, N., Hyde, J., Goldsmith, H., & Van Hulle, C. (2006). Gender differences in temperament: A meta-analysis. *Psychological Bulletin*, *132*, 33–72. doi:10.1037/0033-2909.132.1.33.
- Evans, G., Li, D., & Whipple, S. (2013). Cumulative risk factors and child development. *Psychological Bulletin*, *139*, 1342–1396. doi:10.1037/a0031808.
- Ezpeleta, L., Granero, R., de la Osa, N., Penelo, E., & Dòmenech, J. (2012). Dimensions of oppositional defiant disorder in 3-year-old preschoolers. *Journal of Child Psychology and Psychiatry*, *53*, 1128–1138. doi:10.1111/j.1469-7610.2012.02545.x.
- Fox, N., & Rutter, M. (2010). Introduction to the special section on the effects of early experience on development. *Child Development*, *81*, 23–27. doi:10.1111/j.1467-8624.2009.01379.x.
- Ghera, M., Marshall, P., Fox, N., Zeanah, C., Nelson, C., Smyke, A., & Guthrie, D. (2008). The effects of foster care intervention on socially deprived institutionalized children's attention and positive affect: Results from the BEIP study. *The Journal of Child Psychology and Psychiatry*, *50*, 246–253. doi:10.1111/j.1469-7610.2008.01954.x.
- Gleason, M., Zamfirescu, A., Egger, H., Nelson, A., Fox, N., & Zeanah, C. (2011). Epidemiology of psychiatric disorders in very young children in a Romanian pediatric setting. *European Child Adolescent Psychiatry*, *20*, 527–535. doi:10.1007/s00787-011-0214-0.
- Gross, D., Fogg, L., Young, M., Ridge, A., Cowell, J., Richardson, R., & Sivan, A. (2006). The equivalence of the child behavior checklist 1½–5 across parent race/ethnicity, income level, and language. *Psychological Assessment*, *18*, 313–323. doi:10.1037/1040-3590.18.3.313.
- Henrichs, J., Rescorla, L., Donkersloot, C., Schenk, J., Raat, H., Jaddoe, V., et al. (2013). Early vocabulary delay and behavioral/emotional problems in early childhood: The generation R study. *Journal of Speech, Language, and Hearing Research: JSLHR*, *56*, 553–566. doi:10.1044/1092-4388(2012/11-0169).
- Herba, C., Roza, S., Govaert, P., van Rossum, J., Hofman, A., Jaddoe, V., et al. (2010). Infant brain development and vulnerability to later internalizing difficulties: The generation R study. *Journal of the American Academy of Child and Adolescent Psychiatry*, *49*, 1053–1063. doi:10.1016/j.jaac.2010.07.003.
- Hughes, E., & Gullone, E. (2008). Internalizing symptoms and disorders in families of adolescents: A review of family systems literature. *Clinical Psychology Review*, *28*, 92–117. doi:10.1016/j.cpr.2007.04.002.
- Kersten-Alvarez, L., Hosman, C., Riksen-Walraven, J., van Doesum, K., Smeekens, S., & Hoefnagels, C. (2012). Early school outcomes for children of postpartum depressed mothers: Comparison with a community sample. *Child Psychiatry and Human Development*, *43*, 201–218. doi:10.1007/s10578-011-0257-y.
- Knudsen, A., Skogen, J., Ystrom, E., Siversten, B., Tell, S., & Torgersen, L. (2014). Maternal pre-pregnancy risk drinking and toddler behavior problems: The Norwegian mother and child cohort study. *European Child and Adolescent Psychiatry*, *23*, 901–911. doi:10.1007/s00787-014-0588-x.
- Kovacs, M., & Lopez-Duran, N. (2010). Prodromal symptoms and atypical affectivity as predictors of major depression in juveniles: Implications for prevention. *Journal of Psychology and Psychiatry*, *51*, 472–496. doi:10.1111/j.1469-7610.2010.02230.x.
- LaGasse, L., Derauf, C., Smith, L., Newman, E., Shah, R., Neal, C., et al. (2013). Prenatal methamphetamine exposure and childhood behavior problems at 3 and 5 years of age. *Pediatrics*, *129*, 681–688. doi:10.1542/peds.2011-2209.
- Lebeau, R., Glenn, D., Hanover, L., Beesdo-Baum, K., Wittchen, H., & Craske, M. (2012). A dimensional approach to measuring anxiety for DSM-5. *International Journal of Methods in Psychiatric Research*, *21*, 258–272. doi:10.1002/mpr.1369.
- Liles, B., Newman, E., LaGasse, L., Derauf, C., Shah, R., Smith, L., et al. (2012). Perceived child behavior problems, parenting stress, and maternal depressive symptoms among prenatal methamphetamine users. *Child Psychiatry and Human Development*, *43*, 943–957. doi:10.1007/s10578-012-0305-2.
- Liu, J., Hanlon, A., Ma, C., Zhao, S., Cao, S., & Compher, C. (2014a). Low blood zinc, iron, and other sociodemographic factors associated with behavior problems in preschoolers. *Nutrients*, *6*, 530–545. doi:10.3390/nu6020530.

- Liu, J., Leung, P. L., McCauley, L., Ai, Y., & Pinto-Martin, J. (2013). Mother's environmental tobacco smoke exposure during pregnancy and externalizing behavior problems in children. *Neurotoxicology*, *3*, 4167–4174. doi:10.1016/j.neuro.2012.11.
- Liu, J., Liu, X., Wang, W., McCauley, L., Pinto-Martin, J., Wang, Y., et al. (2014b). Blood lead concentrations and children's behavioral and emotional problems: A cohort study. *JAMA Pediatrics*, *168*, 737–745. doi:10.1001/jamapediatrics.2014.332.
- Mash, E., & Hunsley, J. (2007). Assessment of child and family disturbance. In E. Mash & R. Barkley (Eds.), *Assessment of childhood disorders*. New York: The Guilford Press.
- Mistry, K., Minkovitz, C., Strobino, D., & Borzekowski, L. (2007). Children's television exposure and behavioral and social outcomes at 5.5 years: Does timing of exposure matter? *Pediatrics*, *120*, 762–769. doi:10.1542/peds.2006-3573.
- Moher, D., Liberati, A., Tetzlaff, J., Altman, D., & The PRISMA Group. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLoS Medicine*, *6*, 1–6. doi:10.7326/0003-4819-151-4-200908180-00135.
- NICHD Early Child care Research Network. (1999). Chronicity of maternal depressive symptoms, maternal sensitivity, and child functioning at 36 months. *Developmental Psychology*, *35*(5), 1297–1310. doi:10.1037/0012-1649.35.5.1297.
- Ogg, J., Dedrick, R., Brinkman, T., & Carlson, J. (2010). Factor structure and invariance across gender of the Devereaux early Childhood Assessment Protective Factor Scale. *School Psychology Quarterly*, *25*, 107–118. doi:10.1037/a0020251.
- Paterson, J., Carter, S., Gao, W., Cowley-Malcolm, E., & Iusitini, L. (2008). Maternal intimate partner violence and behavioural problems among Pacific children living in New Zealand. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, *49*, 395–404. doi:10.1111/j.1469-7610.2007.01841.x.
- Paterson, J., Taylor, S., Schluter, P., & Iusitini, L. (2013). Pacific Islands Families (PIF) study: Behavioral problems during childhood. *Journal of Child and Family Studies*, *22*, 231–243. doi:10.1007/s10826-012-9572-6.
- Poehlmann, J., Hane, A., Burnson, C., Maleck, S., Hamburger, E., & Shah, P. (2012). Preterm infants who are prone to distress: Differential effects of parenting on 36-month behavioral and cognitive outcomes. *Journal of Child Psychology and Psychiatry*, *53*, 1018–1025. doi:10.1111/j.1469-7610.2012.02564.x.
- Poehlmann, J., Schwichtenberg, A., Shah, P., Schlafer, R., Hahn, E., & Maleck, S. (2010). The development of effortful control in children born preterm. *Journal of Clinical Child and Adolescent Psychology*, *39*, 522–536. doi:10.1080/15374416.2010.486319.
- Rast, P., & Hofer, S. (2014). Longitudinal design considerations to optimize power to detect variances and covariances among rates of change: Simulation results based on actual longitudinal studies. *Psychological Methods*, *19*, 133–154. doi:10.1037/a0034524.
- Rescorla, L. (2005). Assessment of young children using the Achenbach system of empirically based assessment (ASEBA). *Mental Retardation and Development Disabilities*, *11*, 226–237. doi:10.1002/mrdd.20071.
- Rescorla, L., Achenbach, T., Ivanova, M., Harder, V., Otten, L., Bilenberg, N., & Verhulst, F. (2011). International comparisons of behavioral and emotional problems in preschool children: Parents' reports from 24 societies. *Journal of Clinical Child and Adolescent Psychology*, *40*, 456–467. doi:10.1080/15374416.2011.563472.
- Ronan, K., Canoy, D., & Burke, K. (2009). Child maltreatment: Prevalence, risk, solutions, obstacles. *Australian Psychologist*, *44*, 195–213. doi:10.1080/00050060903148560.
- Rothbart, M., Ahadi, S., Hershey, K., & Fisher, P. (2001). Investigations of temperament at 3–7 years: The children's behavior questionnaire. *Child Development*, *72*, 1394–1408. doi:10.1111/1467-8624.00355.
- Ruiter, K., Dekker, M., Verhulst, F., & Koot, H. (2007). Developmental course of psychopathology in youths with and without intellectual disabilities. *Journal of Child Psychology and Psychiatry*, *48*, 498–507. doi:10.1111/j.1469-7610.2006.01712.x.
- Steenweg-de Graaff, J., Roza, S., Steegers, E., Hofman, A., Verhulst, F., Jaddoe, V., & Tiemeier, H. (2012). Maternal folate status in early pregnancy and child emotional and behavioral problems: The generation R study. *The American Journal of Clinical Nutrition*, *95*, 1413–1421. doi:10.3945/ajcn.111.030791.
- Steenweg-de Graaff, J., Tiemeier, H., Steegers-Theunissen, R. M., Hofman, A., Jaddoe, V., Verhulst, F., & Roza, S. (2014). Maternal dietary patterns during pregnancy and child internalising and externalising problems. The generation R study. *Clinical Nutrition (Edinburgh, Scotland)*, *33*, 115–121. doi:10.1016/j.clnu.2013.03.002.
- Trentacosta, C., Hyde, L., Shaw, D., Dishion, T., Gardner, F., & Wilson, M. (2008). The relations among cumulative risk, parenting, and behavior problems during early childhood. *Journal of Child Psychology and Psychiatry*, *49*, 1211–1219. doi:10.1111/j.1469-7610.2008.01941.x.
- Twomey, J., LaGasse, L., Derauf, C., Newman, E., Shah, R., Smith, L., et al. (2013). Prenatal methamphetamine exposure, home environment, and primary caregiver risk factors predict child behavioral problems at 5 years. *American Journal of Orthopsychiatry*, *83*, 64–72. doi:10.1111/ajop.12007.
- Utendale, W., & Hastings, P. (2011). Developmental changes in the relations between inhibitory control and externalizing problems during early childhood. *Infant and Child Development*, *20*, 181–193. doi:10.1002/icd.691.
- Van Batenburg-Eddes, T., Brion, M., Henrichs, J., Jaddoe, V., Hofman, A., Verhulst, F., et al. (2013). Parental depressive and anxiety symptoms during pregnancy and attention problems in children: A cross-cohort consistency study. *Journal of Child Psychology and Psychiatry*, *54*, 591–600. doi:10.1111/jcpp.12023.
- Velders, F., Dieleman, G., Henrichs, J., Jaddoe, V., Hofman, A., Verhulst, F., et al. (2011). Prenatal and postnatal psychological symptoms of parents and family functioning: The impact on child emotional and behavioral problems. *European Child and Adolescent Psychiatry*, *20*, 341–350. doi:10.1007/s00787-011-0178-0.
- Verlinden, M., Tiemeier, H., Hudziak, J., Jaddoe, V., Raat, H., Guxens, M., et al. (2012). Television viewing and externalizing problems in preschool children: The generation R study. *Archives of Pediatrics and Adolescent Medicine*, *166*, 919–925. doi:10.1001/archpediatrics.2012.653.
- Watamura, S., Philips, D., Morrissey, T., McCartney, K., & Bub, K. (2011). Double Jeopardy: Poorer social emotional outcomes for children in the NICHD SECCYD experiencing HOME and child-care environments that confer risk. *Child Development*, *82*, 48–65. doi:10.1111/j.1467-8624.2010.01540.x.
- Westfall, J., Keny, D., & Judd, C. (2014). Statistical power and optimal design in experiments in which samples of participants respond to samples of stimuli. *Journal of Experimental Psychology: General*, *143*, 2020–2045. doi:10.1037/xge0000014.
- Zeanah, C. H., Boris, N. W., & Larrieu, J. A. (1997). Infant development and developmental risk: A review of the past 10 years. *Journal of the American Academy of Child and Adolescent Psychiatry*, *36*, 165–178. doi:10.1097/00004583-199702000-00007.