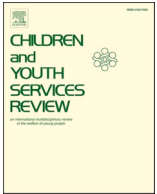




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Are children and adolescents in foster care at greater risk of mental health problems than their counterparts? A meta-analysis[☆]

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ABSTRACT

This meta-analysis aims at comparing mental health problems of children in foster care to those living with their biological parents while taking in consideration different protective and risk factors. Across 41 studies with a total of 72 independent effect sizes, a significant but small effect size was found between foster care placement and psychopathology ($d = 0.19$). Children in foster care showed higher levels of psychopathology compared to those from community samples or matched/at-risk samples. They were as likely to show mental health problems as maltreated children living with their biological parents or children from clinical samples. Results showed that foster children's mental health problems also varied as a function of type of placement and study methodological characteristics. Being placed in kinship care, longer stay in the same foster home and fewer placement disruptions, all acted as protective factors limiting mental health problems of children in foster care.

1. Introduction

It is well documented that child maltreatment has a pervasive impact on child development and mental health (Cicchetti & Toth, 2005). Given that most children in foster care have experienced maltreatment and disruptions in attachment relationships before placement, one would expect that these traumatic experiences put them at greater risk of psychopathology than children living with their biological parents regardless of their current living conditions. Epidemiological studies have confirmed this hypothesis (e.g., Burns et al., 2004; Harman, Childs, & Kelleher, 2000). However, a closer look at the findings indicates that these results are not all one-sided, because some studies do not confirm the established hypotheses. Perhaps child-related risk factors, study design, and type of comparison group modulate the level of mental health problems showed by children in foster care. For instance, studies

have compared children in foster care to those exposed to various psychosocial or clinical risk conditions, or care arrangements, which are likely to have produced different results. To untangle these differences, the current study uses a meta-analytic approach to compute effect sizes of all available studies and assess whether such effect sizes vary as a function of child and environmental risk conditions. By comparing children in foster care to those living with their biological parents while taking into consideration different protective and risk factors, this meta-analysis can provide a more in-depth appreciation of the factors associated with psychopathological risk levels of children in foster care.

1.1. Children and adolescents in foster care

Child Protective Services' (CPS) mandate is to ensure the physical and psychological safety of youths who have been victimized or are at

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risk of experiencing abuse and neglect. When the family environment compromises children's safety and well-being, children may be placed in an alternative resource, generally a foster family or a residential care facility. Placement decisions are made when the family of origin can no longer take care of the child despite CPS interventions. Although applied in the most severe situations, placement involves about 23% of maltreated children in the U.S. (U.S. Department of Health & Human Services, 2015) and 8% in Canada (Trocmé et al., 2010).

In 2017, in the United States, 442,995 youths were in substitute care (U.S. Department of Health & Human Services, 2018), which is equal to a rate of approximately 6 youths in out-of-home care per 1000. This number is slightly lower but similar to the 8.5 ratio found in Canada (Jones, Sinha, & Trocmé, 2015) and the 8.1 ratio observed in Australia (Australian Institute of Health and Welfare, 2016). Because children should be placed in the least restrictive environment to meet their needs, the majority of American children reside in foster family homes with relatives (kinship: 32%) or with non-relative adults (traditional foster care: 45%; U.S. Department of Health & Human Services, 2018). Children and adolescents can also be placed in institutions or residential care where they are looked after by professional caretakers (13% of Americans in substitute care; Ibid.). This can be the best option for children and adolescents dealing with special needs or difficulties that may limit their capacity to benefit from a family foster home. But such care arrangements are very structured and intrusive in a child's life and many have argued against these types of substitute care settings (Dozier, Zeanah, Wallin, & Shaffer, 2012).

In the last two decades, epidemiological studies were conducted to compare nationally representative cohorts of children in foster care to those of children living with their biological parents. For example, among these studies are the National Survey of Child and Adolescent Well-Being (NSCAW) and the National Health Interview Survey (NHIS). In general, results reveal an increased risk for children in foster care to show higher levels of psychopathology and clinical disorders than others (Billing, Ehrle, & Kortenkamp, 2002; dosReis, Magno Zito, & Safer Soeken, 2001; Pilowsky & Wu, 2006), but this is not found in all studies. Perhaps risk factors associated with psychopathology, which vary from one epidemiological study to another, may moderate the relation between foster care and psychopathology, and shed light on equivocal results reported in the literature. For instance, a study derived from the utilization and expenditure data of the California's Medi-Cal program showed that children in foster care were more likely to consult for conduct, emotional, and adjustment disorders than other children, but less so for attention deficit disorders, specific developmental disorders, schizophrenic disorders, and psychosexual disorders (Halfon, Berkowitz, & Klee, 1992). Another study using Medicaid claims from the state of Pennsylvania found that rates of diagnosis for mental health problems were higher for children in foster care than for those living in low-income families but comparable to those of children with disabilities (Harman et al., 2000).

Another study – the Australian National Survey of Mental Health and Well-being – showed that children and adolescents in foster care had more externalizing problems than those from the community (Sawyer, Carbone, Searle, & Robinson, 2007). However, results concerning internalizing problems were less clear, as the effect sizes varied depending on the informant (Sawyer et al., 2007); a significant difference was found when internalizing problems were reported by caregivers but not when self-reported by youths. In addition, results from the NHIS showed that when compared to early school-age community children (5–11 year olds), those living in foster care had significantly more behavioral problems, but this difference was not found in older children (12–17 year olds; Brand & Brinich, 1999). Finally, results from the NSCAW suggested that children in traditional foster care are more likely to differ from children in the community than those placed in kinship care (Burns et al., 2004).

Overall, epidemiological studies provide relevant information on the psychopathology of children in foster care. However, results differ

according to a series of factors such as type of disorder, comparison group, informant, type of foster care, and child age. In addition, although methodologically sound, these data sets have limitations for which further studies are needed. For instance, the number of children in foster care and comparison groups varies considerably, and sometimes the difference can amount to thousands of children. Data also often rely on medical visit records, which underestimates the number of children with symptoms of psychopathology who have no record of medical consultations. Also, these studies have generally not included maltreated children living with their biological parents as a comparison group and the type of foster care is rarely specified. Finally, with the exception of one study from Australia, all of the epidemiological studies are from the U.S. To overcome these shortcomings, a *meta-analysis* using all single available studies could provide relevant data on the mental health problems of children in foster care.

A recent *meta-analysis* including 31 studies and 11,611 children and adolescents (aged 0–18 years) examined the developmental outcomes of foster youths in comparison to that of youths from the general population and at-risk families (Goemans, van Geel, van Beem, & Vedder, 2016). Results showed that children and adolescents in foster care did not differ from those at-risk with respect to adaptive functioning and behavior problems. However, compared to children and adolescents of community samples, individuals in foster care showed lower levels of adaptive functioning and more externalizing and total behavior problems. Notably, no moderators were tested despite the significant heterogeneity that was found among the studies. Moreover, children in foster care were only compared to two groups of children (i.e., community and at-risk samples), providing no information on how children in foster care differ or not from maltreated children living with their biological parents. Also, psychiatric diagnoses were not considered as an outcome. Although valuable, this *meta-analysis*, by restraining its scope to a few comparison groups and measures of mental health problems, precluded a deeper understanding of available data.

1.2. Individual and methodological characteristics mitigating the risk for mental health problems

One of the challenges encountered in this research field is that cross-sectional studies often include in the same foster care group children with different life experiences. Such differences may confound and blur some of the differences found between foster care and comparison samples. For instance, characteristics of youths in foster care, study design, and publication features may all influence the impact of study results. These methodological issues clearly need to be considered in order to better appreciate how foster children differ from those in other living conditions in terms of psychopathology.

1.2.1. Children age and sex

Children and adolescents in substitute care represent a heterogeneous group with respect to age, with 42% of children aged between 0 and 5 years and 32% between 6 and 12 years (U.S. Department of Health & Human Services, 2018). This wide age range may affect study effect sizes, given that the onset of mental health problems occurs sometime between early childhood and late adolescence (Kessler et al., 2007). Child sex may also be related to the development of specific psychopathology, boys being at greater risk of showing attention-deficit/hyperactivity disorders and girls more inclined to develop mood disorders (Merikangas et al., 2010). Child age and sex ought to be examined as potential moderators when exploring mental health problems.

1.2.2. Placement characteristics

Research has shown that placement characteristics may be related in various degrees to manifestations of mental health and behavior problems of children in foster care. A previous *meta-analysis*, conducted a decade ago, revealed that children in nonkinship foster care, in

comparison to those in kinship foster care, showed more behavior problems and mental health disorders, as well as lower overall well-being (Winokur, Holtan, & Valentine, 2009). Similarly, a study not included in the *meta-analysis* found that children placed in non-kinship foster care showed higher levels of internalizing problems compared to children placed in kinship foster care (Lawrence, Carlson, & Egeland, 2006). However, this study found no significant association between behavior problems and length and stability of care, or age at entry into care.

In a cross-sectional epidemiological study including about 3,000 children, the percentage of children with emotional needs increased with time spent in foster care (Sullivan et al., 2008). Another study showed a positive linear association between age at entry into care and mental health problems, but only for those placed after the age of 7 months (Tarren-Sweeney, 2008). Contrary to Lawrence and colleagues' (2006) study, findings from the NSCAW showed that children with unstable placements had twice the odds of having behavior problems than children who experienced early placement stability (Rubin, O'Reilly, Luan, & Localio, 2007). The association between behavior problems and placement instability was also corroborated by two studies testing factors associated with placement disruptions (Newton, Litrownik, & Landsverk, 2000; Oosterman, Schuengel, Slot, Bullens, & Doreleijers, 2007). Perhaps length in care, placement stability and age at placement contribute to discrepancies in results, which could be untangled if tested as moderators in a *meta-analysis* considering all available study results.

1.2.3. Study designs and features

Other potential moderators include country of the study, type of outcomes (symptoms vs. diagnoses), informants, and publication status and year. These may be relevant factors to take into account when explaining differences in study effect sizes, and they were also considered in the current study.

1.3. Current study

The general purpose of this study is to evaluate the extent with which children in foster care show mental health problems. To meet this objective, it is important to assess under which conditions (moderators) study effect sizes vary. Precisely, the current *meta-analysis* addresses the following questions: First, are children and adolescents between the ages of 0 and 21 and living in foster care more at risk of mental health issues (mental health disorders or symptoms or behavior problems), in comparison to children and adolescents living with their biological parents? Second, and most importantly, are placement and sample characteristics as well as study design and features moderate study effect sizes? We hypothesize that youths in foster care will show more mental health problems than youths living with their biological parents and that methodological characteristics and various risk and protective factors of both groups (placed vs. nonplaced children) will be related to variation in effect sizes.

2. Methods

2.1. Protocol and registration

The protocol of this *meta-analysis* was not registered.

2.2. Eligibility criteria

To be included in the *meta-analysis*, a study had to fulfill the following four criteria. First, it had to include a target group of children living in foster care at the time of intake, with more than 75% of the children under 21 years of age. Second, the target group had to be compared to a sample of children living with their biological parents. This comparison group could be from a normative community sample, a matched- (on child characteristics [e.g., age and sex] or caregiving

environment [e.g., neighborhood, SES]) or at-risk sample (e.g., low-income), a clinical sample, or a sample of children from CPS (reported for maltreatment and living with their biological parents). Third, the study had to report the association between care arrangements and child psychopathology or mental health problems. Studies with data on mental, emotional or behavioral disorders or symptoms were retained. Fourth, studies had to provide sufficient data to compute an effect size. To avoid duplication of children, for different studies using the same children or sample, we kept only the publications that had the biggest sample size or more numerous outcomes (significant or not) when sample sizes were equivalent. Because epidemiological studies are based on samples of thousand of children, these studies were excluded from the current *meta-analysis* to avoid potential statistical bias, given that they would be considered as outliers.

2.3. Search

Published and unpublished literature were searched using PsycINFO (which included PsycARTICLES, PsycTESTS, PsycTHERAPY, and APA books), ERIC (EBSCO; which included MEDLINE), ProQuest Dissertations and Theses, and Google Scholars. We used the following keywords and search strategy: (placement OR foster OR out-of-home care) AND ((behavior) problem* OR disorder* OR (mal)adjustment OR mental health OR clinical referral* OR psychopathology). We also searched the reference lists of all articles and chapters that were retrieved.

2.4. Study selection

Four research assistants independently screened articles for eligibility. They selected the studies on the basis of the title and the abstract, and when necessary, read the whole paper to confirm eligibility. In cases of disagreement about the inclusion of an article, a fifth person made the final decision. The whole process was reviewed by the first author.

2.5. Data extraction and coding of study features

Two independent reviewers extracted data using a pre-established grid in order to systematize data extraction. Each study was coded for (a) sample characteristics: sample size, average age of children, child sex (% of boys in the sample); (b) type of foster care: traditional foster care, kinship care, mixed foster care, not specified; (c) comparison group: community sample, matched (on child characteristics or neighborhood)/at-risk sample (e.g., low-income sample), children involved with CPS, or clinical sample (children recruited in an inpatient or outpatient clinic or with a clinical diagnosis); (d) child mental health or behavior problem outcomes; (e) type of outcome score: categorical versus continuous variable; (f) informant: caretaker, child, teacher, professional experts (e.g., child psychiatrist, accredited evaluator); (g) type of instrument: inventory, interview, files; (h) country where the study was conducted; (i) publication year of the study; (j) publication type: published study or dissertation; (k) placement characteristics: time spent in care, age at placement, number of placements. All studies were assessed by two coders who achieved excellent reliability on 20% of the case studies (r_{icc} between 0.88 and 1.00; $kappa$ between 0.94 and 1.00).

2.6. Quality of individual studies

To ensure that every study reached minimal quality standards, the study quality was assessed using a list of criteria applicable to non-experimental research. We examined (a) whether data was collected for both foster care and comparison groups; (b) whether studies included validated instruments; and (c) study characteristics (publication year, dissemination type, etc.). These were coded as a proxy of study quality and used as moderators in the *meta-analysis*.

2.7. Summary measures and synthesis of results

Effect sizes (Cohen d) of each study were computed using random effects model parameters with the *Comprehensive Meta-Analysis software* 3.3.070 (CMA) by Borenstein, Hedges, Higgins, and Rothstein (2014). Each child was included in the meta-analysis only once. However, in some studies, multiple informants completed the same outcome measure for one child. To avoid duplication of information within one study, all effect sizes were collapsed into one effect size. Multiple group comparisons within one study (e.g., studies with more than two groups), which was observed in 11 studies, were treated according to Cochrane's Handbook recommendations in order to balance study weight (Higgins & Green, 2011). That is, for studies ($k = 6$) that used dichotomous outcome variables and compared one specific group to another more than once, both the number of events and the total number of participants were divided by the total number of comparison groups. For studies with continuous outcomes ($k = 5$), only the total number of participants was divided by the number of comparison groups and the means and standard deviations were left unchanged. According to Cohen (1988) criteria, a d value of up to 0.20 is considered a small effect, a d value of about 0.50 is a medium effect, and a d value of about 0.80 and higher can be seen as a large effect. In the current meta-analysis, a positive d value would show that foster care children and adolescents exhibit more problems than those in the comparison groups. Table 1 lists all included studies. For studies with more than two groups of children, an effect size was computed for each comparison made in the individual study. Therefore, the final number of effect sizes exceeded the number of studies.

Significance tests and moderator analyses were performed using random effects models because of the heterogeneity of the study population. Random effects models allow for the possibility of random differences between studies that are associated with variations in procedures, measures, and settings that go beyond subject level sampling error, and thus point to different study populations (Lipsey & Wilson, 2001). The random effects model is more conservative than the fixed effects model because it considers sampling errors occurring from two sources of variance, that is, within and between studies. The Q -statistic for the homogeneity of a specific set of effect sizes and the I^2 , which represents the percentage of variation across studies that is due to heterogeneity, were used and presented in Table 2. Also, the Q -statistic, which we represented in Tables as Q for contrasts, was also used to compare effect sizes of different sets of studies according to moderators (Borenstein, Hedges, Higgins, & Rothstein, 2005; Rosenthal, 1995; Mullen, 1989). Comparisons were only tested when two or more of the subsets of studies consisted of at least four studies (Bakermans-Kranenburg, Van Ijzendoorn, & Juffer, 2003). Moderation analyses were performed on sample characteristics (child age and sex in the foster care group and type of comparison group), placement characteristics (type of foster care, time in care, age at placement, and number of placements), and study design and features (informant, categorical versus continuous outcomes, type of instrument, country of the study, dissemination type and publication year).

2.8. Risk of bias across studies

A publication bias is when studies reporting higher effect sizes are more likely to be published than those with lower effect sizes. Because published literature is more likely to find its way to a meta-analysis, any bias in the literature is likely to be reflected in the meta-analysis (Borenstein et al., 2005). To minimize the risk of publication bias, we made a thorough search of the available literature, including gray (unpublished dissertation) and published literature, and used multiple databases and multiple sources. Of the 41 studies included in the current meta-analysis, seven are from the unpublished literature (dissertation) with a total of 13 out of 72 effect sizes. In addition, publication status was included as a potential methodological moderator.

Potential publication bias was estimated using the Duval and Tweedie (2000) trim-and-fill method that is available in CMA. In a funnel plot, each study's effect size is plotted against its precision ($1/SE$). The robustness of the combined effect size was also examined by computing the fail-safe number, which is the number of studies with null results that would be needed to change the effect size into a nonsignificant outcome (Mullen, 1989; Rosenthal, 1991).

3. Results

3.1. Study selection

Forty-one studies, which comprised 58 foster care samples and 59 comparison samples, were included in the present meta-analysis, with a total of 72 independent effect sizes (N in foster care groups = 4,287 children; N in comparison groups = 7,820 children). The process of study selection is illustrated in a flow diagram following PRISMA guidelines (Fig. 1).

Of the 41 included studies, 26 were conducted in the U.S., three in England, two in Belgium, and one in each of the following countries: Australia, Canada, Chile, Croatia, Ireland, the Netherlands, Norway, Serbia, Spain, and Turkey. All studies were published between 1988 and 2017. The sample size of the foster care groups ranged from 5 to 839. All the characteristics of the selected studies are presented in Table 1.

3.2. Mental health problems of youths in foster care versus that of youths living with their biological parents

We computed effect sizes for the overall difference between foster youths ($N = 4,287$) and youths living with their biological parents ($N = 7,820$) in the 41 studies (Table 2). Foster youths showed higher levels of mental health problems compared to other children as indicated by a significant but small effect size, $d = 0.19$, 95% CI [0.11 – 0.28]. A total of 1,244 studies with null results would be needed to cancel out this combined effect size, and no study was missing according to the Duval and Tweedie procedure, suggesting no publication bias (see the funnel plot in Fig. 2). The I^2 -statistic is 80.50, which suggests considerable heterogeneity of effect sizes. Considering the significant Q statistic and the magnitude of the I^2 , there is a need to examine moderators of the association between groups and mental health problems.

3.3. Moderating effects

We examined the degree to which sample characteristics, placement characteristics, and study design and features moderated the effect sizes obtained in the studies. The results are presented in Tables 2 and 3.

3.3.1. Sample characteristics

A significant difference was found between effect sizes according to the comparison group (Table 2). Children in foster care showed more psychological problems than those in community ($k = 16$, $d = 0.39$, $p < .001$ CI [0.21 – 0.57]) and matched/at-risk samples ($k = 25$, $d = 0.37$, $p < .001$ CI [0.22 – 0.52]), but they did not differ from maltreated children involved with CPS ($k = 22$, $d = -0.04$, $p > .10$ CI [-0.14 – 0.06]) or children from clinical samples ($k = 9$, $d = -0.06$, $p > .10$ CI [-0.25 – 0.14]). Meta-regression analyses did not yield any significant difference on child age and sex (Table 3).

3.3.2. Placement characteristics

Type of foster care yielded significant differences among studies (Table 2). With the exception of children placed in kinship care ($k = 13$, $d = 0.02$, $p > .10$, CI [-0.14 – 0.17]) who did not differ from unplaced children on mental health problem, those placed in traditional ($k = 19$, $d = 0.22$, $p = .001$, CI [0.09 – 0.35]), mixed ($k = 8$, $d = 0.41$, $p < .001$, CI [0.21 – 0.61]) and not specified foster care ($k = 32$, $d = 0.20$, $p < .05$, CI [0.04 – 0.36]) showed more mental health problems than non-placed

Table 1
Studies Included in the Meta-Analysis.

Source	Foster care groups				Comparison groups		Measures (Informant)
	Type	N	% male	Age range in years (M)	Type	N	
Ajduković et al. (2005) ¹	TFC	112	46.4	10–18	CS	200	CBCL (C), YSR (S)
Allen, Combs-Orme, McCarter, and Grossman (2000)	NS	160	50	8–16	MA	60	CDI (S)
Bada et al. (2008)	TFC;	5;	51.7;	3;	CPS	257 ³ ;	CBCL (C)
	Kin;	10;	45.3;	3;			CBCL (C);
	TFC;	51;	51.7;	3;	CPS	159 ³	CBCL (C);
	Kin	86	45.3	3			CBCL (C);
Baker et al. (2008)	NS	50	54	10–12	CS	132	CSBI (C)
Baskin and Sommers (2011)	Mixed	223 ³	46.2	0–12	CPS;	418;	Files (P);
					MA	1,235	Files (P)
Beatty (1995)	NS	43	53.5	4–16	CPS	42	CBCL (C)
Bernedo, Salas, García-Martín, and Fuentes (2012)	NS;	54;	100;	5–17;	CS;	54;	TRF (T);
	NS	43	100	5–17	CS	43	TRF (T)
Beyerlein (2016)	TFC;	118;	41.5;	2–18;	CPS	428 ³	Cl. evaluation (P), CBCL (C);
	Kin	133	41.5	2–18			Cl. evaluation (P), CBCL (C)
Blair (1989)	NS	26	50	6–15	MA	14	SPPI (P)
Colton et al. (1991)	NS	49	53.1	8–14	CPS	58	Rutter scales (C) (T)
Damnjanović et al. (2012)	NS;	49;	39;	8–12;	CS;	118;	PedsQLTM (S);
	NS	55	39	13–18	CS	120	PedsQLTM (S)
Denuwelaere and Bracke (2007)	NS	96	48.4	10–21	MA	96	YSR (S)
Edwards (2009)	Kin	54	55.6	0–12	MA	54	TRF (T)
Fernandez (2008)	TFC;	20;	0;	4–15;	MA;	20;	TRF (T);
	TFC	23	100	4–15	MA	23	TRF (T)
Ford, Vostanis, Meltzer, and Goodman (2007)	TFC	839;	57.4;	5–17;	CPS	103 ³	DAWBA (P);
	Kin	168	57.4	5–17			DAWBA (P)
Garcia Quiroga and Hamilton-Giachritsis (2017)	NS	20	33.3	3–7	CS	20	SDQ (C)
Heflinger, Simpkins, and Combs-Orme (2000)	NS	105	55	2–18	CPS	72	CBCL (C)
Henneghan et al. (2013)	TFC;	9 ³ ;	40.1;	12–14;	CPS;	64 ³ ;	CBCL (C), YSR (S), CDI (S);
	TFC;	7 ³ ;	40.1;	15–18;	CPS;	46 ³ ;	CBCL (C), YSR (S), CDI (S);
	Kin;	31 ³ ;	40.1;	12–14;	MA;	133 ³ ;	CBCL (C), YSR (S), CDI (S);
	Kin	23 ³	40.1	15–18	MA	96 ³	CBCL (C), YSR (S), CDI (S)
Hoyt (1997)	Mixed	37	59.5	8–17	Cl.	257	CBCL (C), TRF (T), DISC-C (P)
Hulsey and White (1989)	NS	65	47.7	0–12	MA	65	CBCL (C)
Jacobsen, Moe, Ivarsson, Wentzel-Larsen, and Smith (2013)	Mixed	60	60	1–2	CS	42	ITSEA (C)
Janssens (2010)	NS	54	45.9	3–17	CPS	62	CBCL (C), TRF (T), YSR (S)
Lawrence et al. (2006)	TFC;	10 ³ ;	52;	NS;	CPS;	21 ³ ;	TRF (T);
	Kin	10 ³	53	NS	CS	48 ³	TRF (T)
Lewis (1999)	NS	24	58.3	14–16	MA	24	CBCL (C), YSR (S)
Lucey, Fox, and Byrnes (2006)	NS	30	46.7	2–4	MA	30	ECBI (C)
Lussier (2009)	NS;	50;	100;	12–18;	Cl.;	50;	CAFAS (P);
	NS	48	0	12–18	Cl.	50	CAFAS (P)
McAuley and Trew (2000)	TFC	18	63.2	(8.42)	MA	18	TRF (T)
Mennen, Brensilver, and Trickett (2010)	TFC;	32 ³ ;	50;	9–12;	CPS;	82 ³ ;	YSR (S), CBCL (C);
	Kin	37 ³	50	9–12	MA	75 ³	YSR (S), CBCL (C)
Pears, Kim, Fisher, and Yoerger (2013) ²	TFC	117	55	0–12	MA	60	CBCL (C), TRF (T)
Persi and Sisson (2008)	TFC	82	NS	4–16	Cl.	540	CBCL (C), DSM-IV (P)
Rork (2007)	Mixed	30	56.7	2–11	MA	30	CBCL (C)
Scheper, Abrahamse, Jonkman, Schuengel, Lindauer, Vries, and Jansen (2016)	NS	59	63	2–7	Cl.	141	CBCL (C)
Schiefer (1994)	NS;	7 ³ ;	50;	4–5;	MA;	3;	CBCL (C)
					CS;	12;	CBCL (C);
	NS;	14 ³ ;	38;	6–11;	MA;	12;	CBCL (C);
					CS;	50;	CBCL (C);
	NS	19 ³	53	12–21	MA;	22;	CBCL (C);
					CS	59	CBCL (C);
Shepherd (2009)	NS	42	52.9	12–18	MA	37	YSR (S)
Timmer, Urquiza, and Zebell (2006)	TFC	98	52.8	2–8	Cl.	75	CBCL (C), ECBI (C)
Üstüner, Erol, and Şimşek (2005)	NS	39	33.3	6–17	MA	62	CBCL (C), TRF (T), YSR (S)
Veloz (2005)	TFC	24	54.2	5–12	MA	20	SSRS (C)
Victor, Wozniak, and Chang (2008)	NS;	40;	52.5;	6–12;	Cl.	10 ³	Cl. evaluation (P), CBCL (C);
	NS	77	55.8	6–12			Cl. evaluation (P), CBCL (C)
Vuchinich, Ozretich, Pratt, and Kneedler (2002)	NS	12 ³	52.2	(13.57)	MA;	23;	CBCL (C);
					CS	23	CBCL (C)
Wald, Carlsmith, Leiderman, and Smith (1988)	Mixed	7 ³	62	4–10	MA;	42;	CBS (C);
					CPS	19	CBS (C)
Williams and Sherr (2009)	NS	39	61.3	3–18	Cl.	173	CAFAS/PECFAS (P)

Note. TFC = traditional foster care; Kin = kinship care; NS = Not specified; CPS = Unplaced children receiving Child Protection Services; CS = Community sample; MA = Matched or at-risk sample; Cl. = Clinical sample. (C) = caretaker; (S) = self-report; (T) = teacher; (P) = professional.

¹ Including results from Bulat (2010) study.

² Including results from Hulette et al. (2008) and Tininenko, Fisher, Bruce, and Pears (2010).

³ Numbers were adjusted to control for duplication of data.

Table 2

Meta-Analytic Results of the Studies Comparing Mental Health Issues of Foster Children and Adolescents with Those of Others.

	<i>k</i>	<i>N</i> of FC	<i>d</i>	95% CI	Homogeneity <i>Q</i>	<i>Q</i> for contrasts
Total set	72	4,287	0.19***	(0.11 – 0.28)	364.12***	
Comparison group						31.49***
Community sample	16	577	0.40***	(0.22 – 0.57)	87.08***	
At-risk/matched sample	25	1,132	0.37***	(0.22 – 0.52)	87.87***	
Sample with CPS	22	2,048	-0.04	(-0.14 – 0.06)	48.82**	
Clinical sample	9	530	-0.06	(-0.25 – 0.14)	37.09***	
Type of foster care						9.53*
Traditional	19	1,505	0.22***	(0.09 – 0.35)	68.61***	
Kinship	13	651	0.02	(-0.14 – 0.17)	45.76***	
Mixed	8	703	0.41***	(0.21 – 0.61)	15.21*	
Not specified	32	1,428	0.20*	(0.04 – 0.36)	190.78***	
Informant						19.61***
Caretaker	26	956	0.33***	(0.16 – 0.50)	162.60***	
Teacher	9	233	0.30***	(0.14 – 0.45)	14.54	
Child	6	436	0.31*	(0.00 – 0.62)	41.67***	
Professional	8	1,616	-0.08	(-0.23 – 0.07)	14.54*	
Multiple	23	1,046	0.06	(-0.08 – 0.19)	75.21***	
Categorical vs. continuous outcome						12.90**
Categorical	24	2,236	0.00	(-0.10 – 0.11)	46.74**	
Continuous	34	1,205	0.30***	(0.17 – 0.43)	205.61***	
Mixed	14	846	0.18†	(-0.02 – 0.39)	68.78***	
Type of instrument						28.66***
Inventory	58	2,184	0.26***	(0.16 – 0.36)	272.17***	
Interview	6	1,170	-0.16*	(-0.29 – -0.03)	7.39	
Files ^a	2	446	0.21	(0.07 – 0.49)	0.80	
Mixed	6	487	-0.07	(-0.29 – 0.14)	23.04***	
Country						3.11
North America	54	2,505	0.21***	(0.11 – 0.31)	243.49***	
Western Europe/Australia	13	1,507	0.12	(-0.09 – 0.33)	91.22***	
Eastern Europe ^a	3	216	-0.00	(-0.23 – 0.22)	8.58*	
Middle East ^a	1	39	0.18	(-0.52 – 0.87)	–	
South America ^a	1	20	1.07	(0.57 – 1.57)	–	
Dissemination type						1.22
Publication	59	3,761	0.17***	(0.08 – 0.25)	272.31***	
Thesis	13	526	0.32*	(0.06 – 0.57)	91.14***	

Note. FC = Foster care; CPS = Child Protection Services. I^2 for the total set is 80.50.

^a Excluded from contrast due to insufficient number of effect size.

† $p < .10$

* $p < .05$;

** $p < .01$;

*** $p < .001$.

children.

Despite the limited number of studies including information on specific placement characteristics (k between 13 and 18), we were able to examine the moderating effects of time in care, age at placement, and number of placements with the available data (Table 3). Results of a meta-regression showed a trend in study effect sizes variation as a function of time in care ($k = 18$, $b = -0.13$, $p < .10$). The direction of the

association suggests weaker effect sizes for longer stay in foster care. Also, effect sizes significantly varied as a function of number of placements ($k = 13$, $b = 0.26$, $p < .05$), with stronger effect sizes obtained in studies that include a greater number of placements. Age at placement was not a significant moderator of between-study heterogeneity.

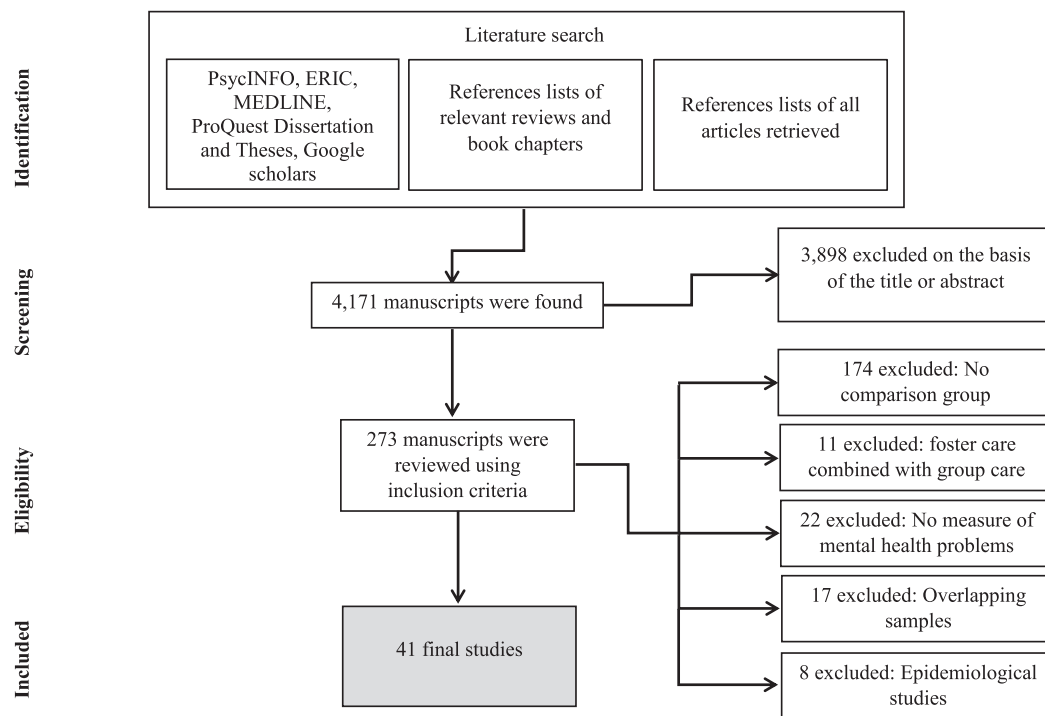


Fig. 1. PRISMA flow diagram.

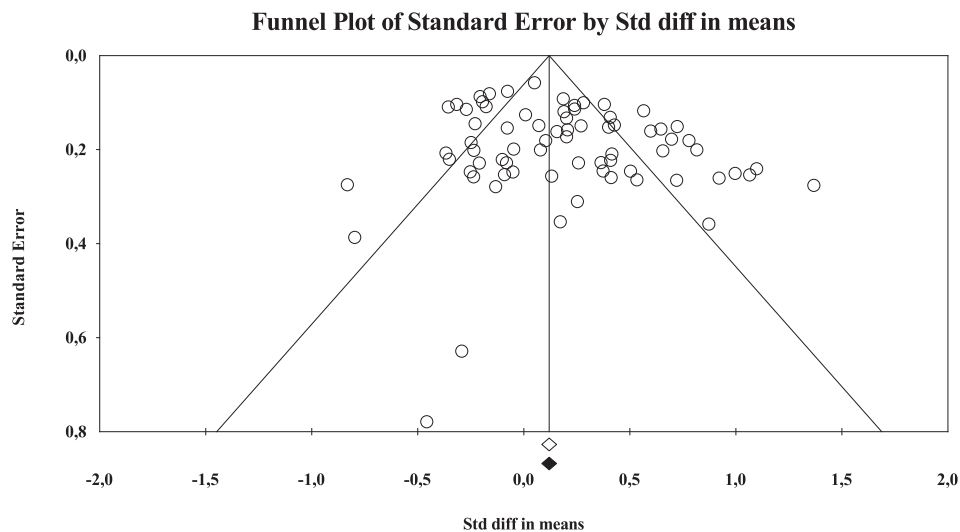


Fig. 2. Funnel plot of the studies comparing youths in foster care to those not in foster care on mental health problems ($k = 72$). The y-axis represents the standard error and the x-axis the effect size. White circles indicate studies that were included in the meta-analysis. The diamonds at the bottom of the funnel plot represent the observed and adjusted effect sizes. Studies were symmetrically distributed around the combine effect size, and thus, no publication bias was suggested.

Table 3

Meta-Regression Results of the Studies Comparing Mental Health Issues of Foster Children and Adolescents with Those of Others.

Continuous moderators	k (studies)	N of FC	Slope	SE	z-value
Child age	68	4,248	-0.02	0.01	-1.37
% of male	72	4,287	0.00	0.00	0.49
Publication year	72	4,287	-0.01	0.01	-1.44
Time in care	18	1,566	-0.13	0.07	-1.90 [†]
Age at placement	14	987	-0.03	0.04	-0.90
Number of placements	13	397	0.26	0.11	2.37*

Note. FC = Foster care.

[†] $p < .10$;

* $p < .05$.

3.3.3. Study design and features

Effect sizes varied as a function of type of informant (Table 2). Stronger effect sizes were obtained in studies using evaluations from caretakers ($k = 26$, $d = 0.33$, $p < .001$, CI [0.16 – 0.50]), teachers ($k = 9$, $d = 0.30$, $p < .001$, CI [0.14 – 0.45]) and children ($k = 6$, $d = 0.31$, $p < .05$, CI [0.00 – 0.62]). However, in studies using evaluations from professionals and data files ($k = 8$, $d = -0.08$, $p > .10$, CI [-0.23 – 0.07]) or from multiple informants ($k = 23$, $d = 0.06$, $p > .10$, CI [-0.08 – 0.19]), no significant group differences were found. Categorical versus continuous evaluations of psychopathology significantly affected effect sizes. Continuous scores of psychopathology ($k = 20$, $d = 0.23$, $p < .001$, CI [0.11 – 0.36]) were associated with stronger effect sizes, whereas categorical ($k = 24$, $d = 0.00$, $p > .10$, CI [-0.10 – 0.11]) or mixed

evaluations ($k = 14$, $d = 0.18$, $p < .10$, CI [-0.02 – 0.39]) did not yield any group differences. Type of instrument was also a significant moderator. Whereas studies using inventories ($k = 58$, $d = 0.26$, $p < .001$, CI [0.16 – 0.36]) found children in foster care to show more problems than other children, those using interviews ($k = 6$, $d = -0.16$, $p < .05$, CI [-0.29 – -0.03]) found opposite results. Studies using mixed instruments ($k = 20$, $d = 0.23$, $p < .001$, CI [0.11 – 0.36]) did not show significant group differences.

Results showed that country of study, dissemination type, and publication year were not associated with effect sizes (Table 3).

4. Discussion

The objective of this *meta-analysis* was to assess whether children in different foster care arrangements are more likely to show mental health problems in comparison to children living with their biological parents, and whether various factors may account for group differences. Given the large body of studies on this topic, which include children of all developmental periods (spanning from 0 to 21 years of age), we were able to synthesize effect sizes of 41 studies comparing mental health issues of 4,287 children and adolescents in foster care to others living with their biological parents. Considering the important heterogeneity of the combined effect size (which includes the total set of studies), it is not interpreted and the discussion focuses on the moderation effects. Overall, when compared to specific groups of unplaced children, results revealed that youths in foster care are more likely to show mental health problems than youths from community ($d = 0.39$) or matched/at-risk samples ($d = 0.37$). However, they are as likely as youths from clinical samples ($d = -0.06$) or involved with CPS ($d = -0.04$) to show mental health problems. Taken together, results of our *meta-analysis* suggest that, despite having been removed from a potentially maltreating environment, foster youths remain particularly vulnerable to the manifestation of mental health problems perhaps because of the traumatic experiences that led to placement in the first place. Potential moderator analyses help shed light on some of the factors that may enhance the risk of or protect against developing symptoms of psychopathology in youths in foster care. Results showed that foster youths' mental health problems vary not only according to the group that they are being compared to, but also to placement and methodological characteristics. These results offer a comprehensive picture of foster children's and adolescents' mental health issues.

4.1. Risk of mental health problems: The importance of the comparison group

Consistent with results obtained in Goemans et al. (2016) *meta-analysis* on foster youths adaptation, we found that youths in foster care show higher levels of mental health problems than youths from community samples. This is in line with observations from epidemiological studies (e.g., Billing et al., 2002). Our study also reveals that youths in foster care show more mental health problems than those from matched/at-risk samples. While this latter result is consistent with some past epidemiological studies (e.g., dos Reis et al., 2001), it differs from those obtain in Goemans et al. (2016) *meta-analysis*. When characteristics of the children or their environment are considered, as in the case of matched samples, it becomes easier to know whether mental health problems are related to placement and to target the factors that led to placement in foster care. Children in matched samples often live in similar neighbourhoods as do children in foster care, and those from at-risk samples are more likely to be part of families with limited financial resources. Hence, our results suggest that being placed in foster care, which usually implies traumatic experiences that led to placement, increases the risk of mental health issues over and above individual characteristics or financial resources.

Children and adolescents in clinical samples show elevated rates of behavior and mental health problems that undoubtedly requires

professional support. The prevalence of children with at least one psychiatric disorder is over 90% in clinical samples of U.S. preschoolers (93%: 2–6 years; Wilens et al., 2002) and UK adolescents (92%: 11–16 years; Goodman, Ford, Richards, Gatward, & Meltzer, 2000). In our study, the fact that foster youths showed levels of mental health problems similar to that of clinically referred children is indicative of their high level of risk of psychopathology. This reiterates the importance for foster children and adolescents to receive close clinical attention from social and health care professionals, especially since many have experienced trauma prior to placement.

Our results showed that youths in foster care show levels of mental health problems similar to those of children living with their biological parents and involved with CPS. Children of both these groups have experienced maltreatment in the past. However, given that foster children are likely to have experienced a greater number or more severe risk factors prior to placement than their maltreated peers remaining with their biological parents (Esposito et al., 2013; Tourigny, Poirier, Dion, & Boisvert, 2010), one would expect them to show higher levels of problems prior to placement and therefore also after placement. The lack of difference between the two groups on mental health problems may suggest that placement in foster care prevents foster youths from deteriorating. It also implies that placement may not be sufficient to diminish the manifestations of behavior problems to a level that would be lower than that of their maltreated peers still living with their biological parents. Child placement in foster care can be considered a form of intervention because it is meant to stop maltreatment and provide an environment conducive to a healthy development. Hence, in addition to indicating the pervasive impact of maltreatment on child mental health problems (Cicchetti & Toth, 2005), results of our review also point to the clinical needs of foster youths and caregivers.

4.2. Methodological factors affecting effect sizes

The strongest effect sizes between placement in foster care and mental health problems were obtained in studies using inventories, continuous psychopathology scores, and reports of psychopathology from caretakers, teachers, and children. A potential confounding effect may account for these results given that continuous measures are more likely to be assessed using inventories completed by non-professionals. Nevertheless, the results suggest that continuous measures may provide a more subtle and nuanced evaluation of child functioning, thus allowing to capture significant variability between children in foster care and those living with their biological parents. For instance, children themselves, or individuals who are in contact with them on a regular basis, may report symptoms that do not reach a clinical threshold when assessed using interviews or clinical evaluations. Yet, child functioning may be impaired. Two *meta-analyses* have shown that the use of continuous over categorical measures of psychopathology increases the reliability and validity of assessments across all types of samples and forms of psychopathology (Markon, Chmielewski, & Miller, 2011). We therefore recommend the use of continuous measures of psychopathology in clinical and research settings, not only because it increases observed validity and reliability but also because it allows to assess improvements and declines in adaptation of youths in foster care over time.

Unexpected results were found in the current *meta-analysis*. First, when studies used interviews to assess mental health problems, children in foster care exhibited fewer problems than other children. However, this result, found in a limited number of studies ($k = 6$), may be due to the high-risk nature of the comparison group of the individual studies, which mostly included children from clinical ($k = 3$) or CPS samples ($k = 2$). Second, problem levels of youths in foster care did not differ from others when mental health problems were reported by multiple informants. Perhaps discrepant views between informants cancelled significant potential effects. A study has revealed that foster caregivers and adolescents generally have low levels of agreement on the adolescents' internalizing and externalizing symptoms (McWey, Cui, Cooper, &

Ledermann, 2018). In McWey et al.'s study, this discrepancy was related to placement type, with less discrepancy found for dyads in kinship care. Despite the non-significant result related to multiple informants, gaining information from multiple sources or perspectives generally allows for a more comprehensive evaluation of a youth's mental health, and should be recommended in clinical settings. Differences in effect sizes due to methodological factors are difficult to disentangle. Clearly more individual studies using multiple measures of psychopathology will be needed to better understand these discrepancies.

4.3. Protective factors associated with better outcomes for youths in foster care

An important contribution of the current synthesis is the identification of protective factors that influence variation in effect sizes. For instance, this study showed that the type of foster families significantly moderated study effect sizes: whereas youths placed in traditional or non-specified foster care show more problems than unplaced children, those placed in kinship care have levels of adaptation that are similar to those of children living with their biological parents. This result could appear counterintuitive considering data from the National Survey of America's Families (NSAF) which showed that children in kinship care were more likely to experience poverty and food insecurity and to have caregivers in poor mental health than children placed in non-kinship foster care (Ehrle & Geen, 2002). Yet, despite potentially greater environmental hardships, our results showed that children placed in kinship care have a better outcome than children in other foster care arrangements. This result is in line with another review showing better functioning for children in kinship care than for those in traditional foster care (see Winokur et al., 2009). Notwithstanding potential environmental risks, protective factors may play a role in the greater adaptation of these children. Because kinship foster caregivers already have a relationship history and a bond with the child, they may be more easily committed and better able to provide the child with a greater sense of security and belonging. The caregiver's level of commitment towards the child, that is, the extent to which the caregiver is motivated to have an enduring relationship with a particular child (Dozier & Lindhiem, 2006), has been shown to be an important factor associated with foster child adjustment in early childhood (Dubois-Comtois et al., 2015; Lindhiem & Dozier, 2007). It may also be easier for children to adapt to familiar caregivers, as opposed to being placed in an unfamiliar setting with unknown caregivers. These conditions may promote a sense of predictability and attenuate the impact of attachment disruptions. More research is necessary to further understand this result.

The current meta-analysis has also identified other protective factors related to placement in foster care. Children placed for a longer period of time (marginal result) and those with lower number of placements are less likely to differ from children living with their biological parents. Although only based on a limited number of studies, these results are consistent with those of other studies. Namely, greater placement stability and more years spent in care are associated with decreased odds of mental health problems during late adolescence (Okpych & Courtney, 2018). Others have also shown that children's problems intensify as the number of placements increases, even after controlling for initial level of behavior problems (Newton et al., 2000). Findings also suggest that placement instability is related to behavior problems among youths in foster care, regardless of type, severity, or frequency of children's maltreatment experiences (McGuire et al., 2018). Taken together, results clearly show stability of placement is a key ingredient to promote child mental well-being.

4.4. Factors that did not moderate effect sizes

Our results revealed that child age and sex were not associated to study effect sizes. While the prevalence of specific symptoms or disorders was found to vary according to child sex (Merikangas et al., 2010),

this does not appear to be the case for the overall prevalence of mental disorders (World Health Organization, 2002). A similar pattern of results has been observed for child age, with age significantly affecting the prevalence of specific disorders but not the overall prevalence of mental disorder (Merikangas et al., 2010). Our results are therefore consistent with other studies. In addition, publication characteristics, that is, type of publication, country where the study was published and year of publication, did not moderate study effect sizes. These variables were considered as a proxy of study quality, and the absence of significant differences consolidate study results. Given that countries and jurisdictions have different legislations, resources, and challenges related to out-of-home care (del Valle et al., 2013), one could have expected to find a moderating effect of country. Results showed that country of study was not associated with effect sizes. The absence of a significant result suggests that variations in countries' legislations, resources, and challenges did not moderate differences in mental health problems. However, considering the relatively small number of available studies, study groupings had to include several countries together (e.g., North American, Western Europe/Australia) rather than testing country-by-country comparisons. More individual studies would be needed to specifically assess this question.

4.5. Limitations, Implications, and conclusions

The current meta-analysis is limited to conclusions regarding overall mental health problems of youths in foster care compared to youths living with their biological parents. Specific disorders and mental health problems of children living in group care were not part of the current review. Also, the evaluation did not take into consideration mental health conditions of youths prior to placement. Trajectories of adaptation of children while in foster care are therefore not available. Given the presence of heterogeneity despite the testing of various moderators, other moderators that were not included in the study, such as past maltreatment experiences, quality of the relationship with the caregiver, and caregivers' commitment, may have influenced effect sizes. These variables should also be investigated in future research. Finally, analyses on time spent in foster care and number of placements were performed on a limited number of studies and should be interpreted with caution.

An important strength of this study is that children and adolescents in foster care are compared with multiple groups of children living with their biological parents and exposed to diverse risk conditions. This exhaustive assessment provides strong evidence of the risks foster youths have in terms of problem behaviors and mental health disorders given prior experiences of maltreatment. In short, we found that youths in foster care have more mental health problems than youths from community or matched/at-risk samples, and are as likely as youths from clinical samples or maltreated youths living with their biological parents to show mental health problems. Our results, in light of Szilagyi, Rosen, Rubin, and Zlotnik (2015) concerns with regards to the services to foster youths, indicate how foster children and their parents are not provided with enough services to overcome difficulties related to past experiences of maltreatment and placement disruptions. The intensity as well as the specificity of the services delivered may not match both children and caregivers' needs. Trauma-informed approach (Collin-Vézina, Rouleau, Brunet, Plante, Légaré, & Milot, 2015; Greeson et al., 2011) should strongly inform practitioners and policy-makers to provide relevant services and resources. If trauma and associated symptoms are not properly understood and addressed by professionals, interventions towards foster children are likely to be unsuccessful.

Another strength of the study is the examination of different contextual and methodological moderators, which allowed for the identification of protective factors. Results of the study suggest that being placed in kinship care, as opposed to traditional foster care, may protect from the development or persistence of mental health problems. Moreover, the longer children stay in the same foster home and the less they experience placement disruptions, the more likely their behavior

will resemble that of children without a placement history. We conclude that placement in foster care is an effective intervention for many children who were exposed to maltreatment. Yet to be most effective, child placement needs to provide a safe, stable and predictable care environment. Such conditions are most advantageous for the development of any child, but they are critical for those who have experienced inconsistencies in parental care and relationship disruptions. Accordingly, attachment tenets and research suggest to work closely with foster families in order to support them in providing warm and sensitive care to foster children despite their difficult behaviors (e.g., Dozier, Zeanah, & Bernard, 2013; Fisher & Stoolmiller, 2008). Quality of the attachment relationship with foster caregivers has been associated with better foster children's adjustment (Oosterman & Schuengel, 2008). However, the struggle of some foster caregivers to form an emotional connection with their foster child translates into the difficulty of being sensitive, supportive and affectionate, which represents a pathway to child maladjustment (Dubois-Comtois et al., 2015). Thus, intervention efforts should not only address foster youths' maladaptation, but also target foster caregivers' ability to commit and form an emotional bond, as a basis for sensitive and contingent care. Efforts should also focus on foster caregivers' well-being and satisfaction in order to promote and maintain placement continuity.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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