
PSYCHOPATHOLOGY IN YOUNG CHILDREN IN TWO TYPES OF FOSTER CARE FOLLOWING INSTITUTIONAL REARING

FLORIN TIBU

Institute of Child Development, Bucharest, Romania

KATHRYN L. HUMPHREYS

Tulane University School of Medicine

NATHAN A. FOX

University of Maryland

CHARLES A. NELSON

Children's Hospital Boston/Harvard Medical School

CHARLES H. ZEANA

Tulane University School of Medicine

ABSTRACT: Institutional rearing of young children has been demonstrated to increase risk for a broad range of psychiatric disorders and other impairments. This has led many countries to consider or to invest in foster care. However, no study to date has explored potential differences in psychiatric symptoms in children placed in different types of foster care. We assessed internalizing disorders, externalizing disorders, and attention deficit hyperactivity disorder (ADHD) in 54-month-old children living with foster families. We compared one group of children living in high-quality foster families who had benefited from specialized training and support to another group of children placed with government-sponsored foster care in Bucharest, Romania. After controlling for duration of time spent in foster care, there was a main group effect in predicting ADHD ($p = .021$) and a marginal group \times gender interaction effect. No effects were noted for signs of externalizing disorders. There was, however, a significant group \times gender interaction effect of signs of internalizing disorders ($p = .007$), with the girls in high-quality foster care having less severe symptomatology than did their counterparts in the government-sponsored group. Governments must invest in quality interventions for their most vulnerable citizens to prevent serious and potentially lasting problems.

RESUMEN: Se ha demostrado que la crianza institucional de niños pequeños aumenta el riesgo en el caso de una amplia gama de trastornos psiquiátricos y otros impedimentos. Esto ha llevado a muchos países a considerar o a invertir en el cuidado de hogares sustitutos. No obstante, ningún estudio hasta la fecha ha explorado las posibles diferencias en los síntomas psiquiátricos en niños colocados en diferentes tipos de hogares sustitutos. Evaluamos los trastornos de internalización, de externalización y ADHD en niños de 54 meses de edad que vivían en hogares sustitutos. Comparamos un grupo de niños que vivía en hogares sustitutos de alta calidad, los cuales se habían beneficiado de un entrenamiento y apoyo especializado, con otro grupo de niños colocados en hogares sustitutos patrocinados por el gobierno en Bucarest, Rumania. Después de verificar la duración del tiempo en los hogares sustitutos, se dio un principal efecto de grupo para predecir ADHD ($p = .021$), y un marginal efecto de grupo a través de la interacción del género sexual. No se notaron efectos de señales de trastornos de externalización. Se presentó, sin embargo, un significativo efecto de grupo por interacción de género sexual en cuanto a trastornos de internalización ($p = .007$), presentando las niñas en hogares sustitutos de alta calidad una sintomatología menos severa que su contraparte en el grupo patrocinado por el gobierno. Los gobiernos deben invertir en intervenciones de calidad para sus más vulnerables ciudadanos con el fin de prevenir problemas serios y potencialmente de larga duración.

RÉSUMÉ: Les recherches ont démontré que le placement en institution / orphelinat de jeunes enfants augmente le risque pour un grand éventail de troubles psychiatriques et autres obstacles. Ceci a mené bien des pays à considérer ou à investir dans le placement en famille. Cependant il n'existe aujourd'hui aucune étude ayant exploré les différences potentielles dans les symptômes psychiatriques chez les enfants placés dans différents types

Direct correspondence to: Florin Tibu, Institute of Child Development, 17 Maresal Averescu Blv., Complexul de Servicii Sociale Sfanta Ecaterina, Corp C, Etaj 1, Bucharest, Romania 011454; e-mail: florin.tibu@idc.ro.

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de placement en famille. Nous avons évalué les troubles d'internalisation, les troubles d'externalisation et le trouble déficitaire de l'attention avec hyperactivité (ADHD) chez des enfants de 54 mois vivant dans des familles d'accueil. Nous avons comparé un groupe d'enfants vivant dans des familles d'accueil de haute qualité, familles ayant bénéficié de formation spécialisée et de soutien, à un autre groupe d'enfants placés dans des familles d'accueil sponsorisées par le gouvernement à Bucarest en Roumanie. Après avoir tenu en compte la durée du temps passé en famille d'accueil on a trouvé un effet de groupe principal dans la prédiction d'ADHD ($p = .021$), ainsi qu'un groupe marginal par effet d'interaction par genre. Aucun effet n'a été noté pour signes de troubles d'externalisation. On a trouvé, cependant, un groupe important par effet d'interaction par genre de signes de troubles d'internalisation ($p = .007$), avec les filles des familles d'accueil de haute qualité ayant moins de symptomatologie sévère que leurs contreparties dans le groupe sponsorisé par le gouvernement. Les gouvernements doivent investir dans des interventions de qualité pour leurs citoyens les plus vulnérables de façon à prévenir des problèmes sérieux et potentiellement durables.

ZUSAMMENFASSUNG: Es wurde gezeigt, dass die institutionelle Erziehung von Kleinkindern mit einem erhöhten Risiko für ein breites Spektrum von psychiatrischen Störungen und anderen Beeinträchtigungen einhergeht. Dies hat in vielen Ländern dazu geführt, Pflegeunterbringungen in Betracht zu ziehen oder in Pflege zu investieren. Jedoch hat bisher noch keine Studie die potentiellen Unterschiede hinsichtlich psychiatrischen Symptomen bei Kindern aus unterschiedlichen Pflegeunterbringungen untersucht. Wir beurteilten Internalisierungsstörungen, Externalisierungsstörungen und ADHS bei 54 Monate alten Kindern, die bei Pflegefamilien leben. Wir verglichen eine Gruppe von Kindern, die aus qualitativ guten Pflegeverhältnissen kamen und deren Pflegefamilien ein spezielles Training sowie Unterstützung zugute kam mit einer anderen Gruppe von Kindern, die im Rahmen staatlich geförderter Pflege in Bukarest, Rumänien platziert wurden. Nach der Kontrolle für die insgesamt verbrachte Zeit in den Pflegefamilien, zeigte sich ein Hauptgruppeneffekt für die Vorhersage von ADHS ($p = .021$) und ein marginaler Interaktionseffekt für Gruppe und Geschlecht. Es wurden keine Effekte für Anzeichen von Externalisierungsstörungen gefunden. Es gab jedoch einen signifikanten Interaktionseffekt für Gruppe und Geschlecht hinsichtlich der Anzeichen von Internalisierungsstörungen ($p = .007$), indem Mädchen aus qualitativ guten Pflegeverhältnissen weniger schwere Symptome als ihre Gegenparte aus der staatlich geförderten Pflege hatten. Die Regierungen müssen für ihre schwächsten Bürger in qualitative Interventionen investieren, um möglicherweise schwerwiegende und anhaltende Probleme zu verhindern.

ABSTRACT: Institutional rearing of young children has been demonstrated to increase risk for a broad range of psychiatric disorders and other impairments.

抄録:幼い子どもを施設で育てることにより、広い範囲の精神障害その他の障害へのリスクが増加することが、示されてきた。このために多くの国が里親による養育を考慮し、投資するようになった。しかし、里親のタイプのちがいに、措置された子どもの精神症状が異なる可能性について調査した研究は、今までにない。私たちは、生後54か月の里親家族と生活している子どもについて、内在化障害、外在化障害、そしてADHDを評価した。私たちは、ルーマニアのブカレストにおいて、特別な訓練とサポートの恩恵を受けた高品質な里親家族と生活する子ども達のグループを、政府が支援した里親養育に措置された子どものグループと比較した。里親養育で過ごした時間をコントロールした後に、ADHDを予測する主要なグループ効果があった($p=.021$)。そして限界グループmarginal groupの性別による相互作用効果があった。外在化障害の兆候については、どのような効果も見られなかった。しかし内在化障害の兆候には有意なグループの性別による相互作用効果があり($p=.007$)、高品質の里親養育にいる女の子は、対応する政府に支援されたグループよりも、重い症状が少なかった。重く永続する可能性のある問題を予防するために、政府は最も脆弱な市民への高品質の介入に投資すべきである。

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Institutional rearing of young children increases the risk for profound developmental compromises and psychopathology (Goldfarb, 1945; Nelson et al., 2007; Rutter et al., 2010; Smyke, Dumitrescu, & Zeanah, 2002; Smyke, Koga, Johnson, Zeanah, & the BEIP Core Group, 2007; St. Petersburg–USA Orphanage Research Team, 2008; Tizard & Hodges, 1978; Zeanah, Smyke, Koga, Carlson, & the Bucharest Early Intervention Project Core Group, 2005). Notable variations in quality of caregiving are evident within and across institutions, and these differences impact the severity of deprivation that children experience and the psychological morbidity exhibited as a result (Merz & McCall, 2010).

In a rigorous test of young children's capacity to recover from deprivation, we conducted the Bucharest Early Intervention Project (BEIP), a randomized controlled trial (RCT) of foster care as an alternative to remaining in institutional care in infants who were

abandoned and placed in large institutions in Bucharest, Romania (see Zeanah et al., 2003). The trial began when institutionalized children ranged from 6 to 31 ($M = 22$) months of age, and children were reassessed at 30, 42, and 54 months of age, when the trial ended. A total of 136 children living in one of six institutions in Bucharest and who were free of obvious chromosomal, genetic, or neurological abnormalities or signs of fetal alcohol syndrome were enrolled in the study. Following comprehensive assessments, half were randomized to foster care, which was created for purposes of the study, and monitored and supported by study social workers. The other half received care as usual, meaning that these children remained in institutional care unless the Romanian child protection authorities made other placement arrangements. There were three primary reasons for changes in children's placement status: (a) some children receiving care as usual were adopted within Romania; (b) some children were returned to their biological

families; and (c) some children were placed in government foster care, which did not exist when the study began.

Assessments of functioning when the children were 54 months old indicated that those who had been randomized to BEIP foster families were significantly less likely to have internalizing disorders than were children who were randomized to receive care as usual. We also found that boys were more symptomatic than were girls regardless of their caregiving environment, and unlike girls, boys had no reduction in total psychiatric symptoms following foster placement (see Zeanah et al., 2009). Because these analyses maintained the intent-to-treat model, we argued that the observed reduction in internalizing psychopathology represented a conservative estimate of intervention effects because roughly half of the care-as-usual children were actually living in families at 54 months of age (Nelson, Fox, & Zeanah, 2014).

Investigations of potential mechanisms by which living with foster families is protective revealed that attachment plays an important role. Greater attachment security predicted lower rates of internalizing disorders in both genders. Further, development of attachment security fully mediated the intervention effects on internalizing disorders in girls (McLaughlin, Zeanah, Fox, & Nelson, 2012). These results demonstrated that foster care led to reduced internalizing disorders and total psychiatric symptomatology in children with histories of institutional deprivation, particularly in girls. What is less clear is whether foster care in general is simply better than typical institutional care or whether investing in high-quality foster care is responsible for the positive intervention effects. This is an important question because many countries are considering alternatives to institutional care for orphaned, abandoned, and maltreated children.

During the decade following the initiation of BEIP, the Romanian government began to develop foster care as one approach to coping with the tens of thousands of young children in state care. Under Communist rule, the main form of care for abandoned children had been institutionalization. The government started to implement a foster care system only after reform legislation passed in 1997, and it was several more years before it was available on a meaningful scale in Bucharest (for details, see Nelson et al., 2014). Some of the children who had been randomized to care as usual in BEIP were transferred to government-sponsored foster care that had not existed in 2001 when the study began.

The government foster care initiative provided us with a unique opportunity to compare children in BEIP-sponsored foster care, which we refer to in this article as *MacArthur foster care* (MFC), to children in government-sponsored foster care (GSFC). Whereas MFC was an experimentally designed, well-supported, and carefully monitored network of foster families, GSFC was developed without these characteristics. It is unclear whether GSFC provided sufficient resources to assure children's well-being. For example, the paucity of clinical psychologists and social workers (both specializations at the university level were banned during the last two decades of Communism) could plausibly have limited the training and support offered by the local authorities to foster parents. As a result, limited knowledge of and lack of support in dealing

with common postinstitutional behaviors could be associated with less effective responses to children with high rates of challenging behavior and psychiatric symptoms.

To assess children's psychiatric symptomatology, we elected to examine signs of internalizing and externalizing disorders as well as signs of attention deficit hyperactivity disorder (ADHD). We separated ADHD from externalizing disorders (oppositional defiant disorder and conduct disorder) in keeping with recent research (e.g., Humphreys, Mehta, & Lee, 2012; Wiik et al., 2011), consistent with the theoretical and empirical findings on the separation of ADHD and conduct problems (e.g., Achenbach, 1991; Moffitt, 1990), and the specific deficits in ADHD found in postinstitutionalized children that do not extend to other externalizing psychopathology (Wiik et al., 2011).

In this report, we examined psychopathology in previously institutionalized preschool-aged children who had been placed into foster care at various ages following abandonment and institutionalization. Based on the efforts to create high-quality care in the BEIP (Smyke, Zeanah, Fox, & Nelson, 2009), we predicted lower levels of psychopathology in children in MFC as compared to those in GSFC. If true, this would support the notion that efforts should be made to ensure high-quality foster care.

METHODS

Participants

Participants were children enrolled in the BEIP, which has been described in detail previously (see Zeanah et al., 2009; Zeanah et al., 2003). The 68 children randomized to the foster care group (FCG) were placed in a network of foster families selected, trained, and supported by BEIP staff. At 54 months, 9 of these children were lost to the study (through adoption, returned to biological parents, or were later detected to meet original exclusion criteria). Eight more children had returned to live with their biological parents prior to the 54-month assessment; 1 was adopted, and 1 had been moved to a government-sponsored family following the death of her MacArthur foster parent. Another child had been moved to a new foster family shortly before the assessment took place and was excluded from the current analyses. The remaining 48 children comprise the MFC group.

Children in the care-as-usual group (CAUG) initially remained in institutional care, although over time many of the children were adopted, returned to biological parents, or placed in GSFC that did not exist when the study began (see Figure 1). At 54 months of age, there were 16 CAUG and 1 FCG children (11 boys) who had been residing in GSFC for at least 3 months, and they comprise the GSFC group examined in this study. For inclusion in the present analysis, we required that children live in their current foster care placement for at least 3 months, to match the 3-month period of reporting on signs of psychiatric disorders.

All decisions about children's placements (including moves) were made exclusively by the local Commissions for Child Protection in Bucharest, as per Romanian law. The study was approved by the local Commissions for Child Protection as well as the

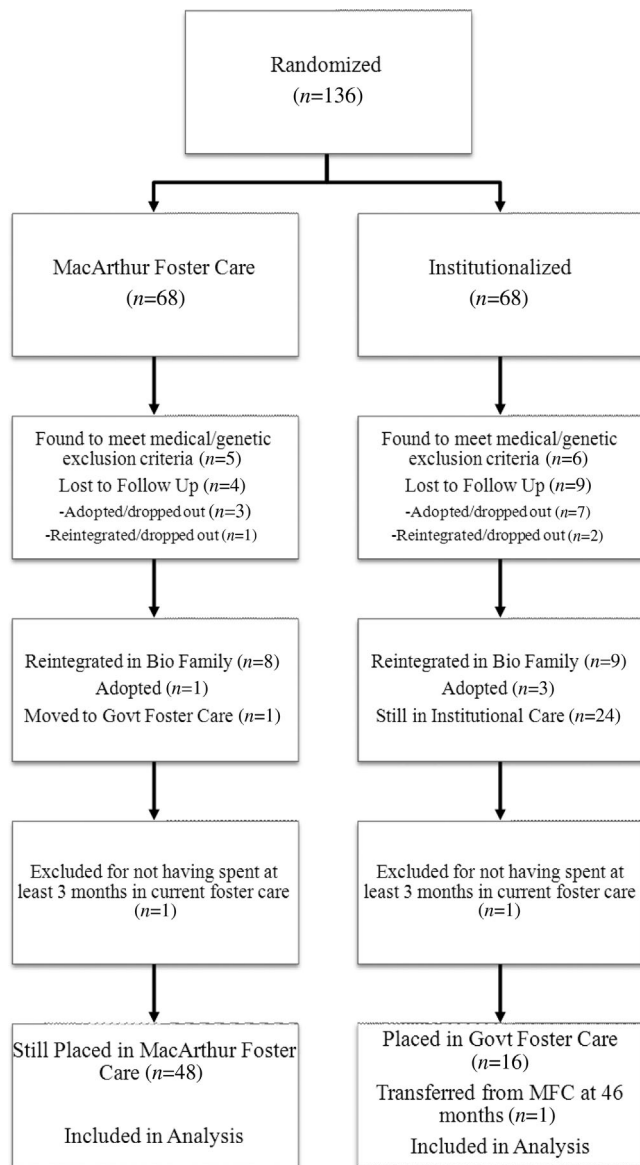


FIGURE 1. Flowchart of study participants.

Institutional Review Boards of the three U.S. universities of the principal investigators. Ethical issues have been discussed previously in some detail by us (Zeanah, Fox, & Nelson, 2012; Zeanah et al., 2006) and by others (Miller, 2009; Millum & Emanuel, 2007).

Foster Care Intervention

The model of foster care implemented in the BEIP has been described in more detail elsewhere (see Nelson et al., 2014; Smyke et al., 2009). The aim was to provide an affordable and culturally appropriate model of foster care that was informed by developmental science about the needs of young children (Zeanah, Shauffer, &

Dozier, 2011). Foster parents were recruited locally and trained by a team of social workers who had previously received training and were supervised through weekly contact with developmental specialists from the United States. This supervision continued through all 4 years of the intervention. One of the core messages delivered to the foster parents was to encourage making a full psychological commitment to the children in their care and to love their foster children as if they were their own. Parents were taught about the effects of institutional rearing on young children's behavior and were encouraged to create structured and warm environments, through predictable and consistent nurturance, that would promote a sense of security and emotional stability. Children's challenging behaviors were addressed mainly through behavioral interventions delivered by teams of social workers and psychologists and focused on effective limit-setting and appropriate rewarding of desirable behavior. In the early phases of the intervention, the social workers were available "on call" for support and advice 24 hours per day. Groups of support and training also were implemented, and all children were visited weekly.

When the children reached the age of 54 months, the intervention ended. Support of the BEIP foster care network was turned over to the local governmental entities in Bucharest, which had been negotiated originally.

Measures

Signs of psychiatric disorders, including ADHD, anxiety disorders, major depression, conduct disorder (CD), and oppositional defiant disorder (ODD), were assessed using a clinician-administered, semistructured diagnostic interview of parents/caregivers about young children, the Preschool Age Psychiatric Assessment (PAPA; Egger, Ascher, & Angold, 1999). The PAPA has been demonstrated to be a reliable and valid instrument for the assessment of psychopathology in young children (Egger et al., 2006). This interview is used to collect information from a parent/caregiver about the presence, frequency, and duration of signs of psychiatric disorders and generates *Diagnostic and Statistical Manual of Mental Disorders, fourth edition* (American Psychiatric Association, 1994) diagnoses as well as symptom counts. The interview was translated into Romanian, and terminology was checked for cultural appropriateness by native Romanian psychologists. The PAPA was administered by the first author of this report, who was trained and supervised by the developers of the interview and who remained blind to the group status (MFC vs. GSFC) of the children throughout the data collection. Foster mothers were the respondents for all participants.

For the purposes of the present study, three domains of psychopathology were examined: signs of internalizing disorders, externalizing disorders, and ADHD. The internalizing symptom counts used here included signs of major depressive disorder, dysthymia, separation anxiety disorder, social phobia, specific phobia, generalized anxiety disorder, and posttraumatic stress disorder. The externalizing symptomatology included signs of ODD and CD. ADHD comprised signs of inattention and hyperactivity/

impulsivity. Results testing the effects of the intervention including the larger BEIP sample have been presented previously (Zeanah et al., 2009).

Procedures

The PAPA interviews were conducted mostly in the foster homes, and assessments were scheduled via telephone by the study staff as soon as possible after the child reached 54 months of age. Nine parents who did not have appropriate conditions for interviewing (e.g., small children living in the home or limited space) were interviewed at the BEIP laboratory. Written consent was obtained from the foster parent and the legal representative of the child.

Statistical Analysis

We first examined the three domains of psychopathology (i.e., internalizing, externalizing, ADHD) by foster care group, gender, and their interaction, independent of covariates, by conducting separate analysis of variance (ANOVA) tests. Next, we examined whether potential covariates were associated with our outcomes of interest. Pending a significant influence on any of the outcome measures, $p < .10$, the covariate was included in subsequent analyses to adjust for these potential effects. Last, we conducted a series of three hierarchical linear regressions to determine the effect of group status over and above the effects of gender and other potential covariates and to examine the role of foster care group \times gender interactions.

RESULTS

All outcome variables and covariates were examined for indicators of skewness and the presence of outliers. Distributions appeared close to normal; consequently, parametric tests were used throughout. Analyses were conducted to determine whether there were any differences between the two foster care groups on child characteristics (Table 1). Gender and ethnicity did not differ between the two groups, and no significant differences were noted on birth outcomes (i.e., birth weight and gestational age) and age at testing. Nevertheless, children in the MFC group had spent significantly more time in foster families than did those children in GSFC prior to the 54-month assessment, $p < .01$.

Foster Care Status, Gender, and Psychopathology

A series of two-way ANOVAs was conducted to test the effects of foster care group and gender on psychopathology at 54 months. For signs of internalizing disorders, there was a main effect of group, $F(1, 61) = 5.12, p = .027, \eta^2 = 0.08$, but not of gender, $F(1, 61) = 0.38, p = .54, \eta^2 = 0.01$. In addition, a significant group \times gender interaction effect was found, $F(1, 61) = 7.64, p = .008, \eta^2 = 0.11$. Overall, children in the GSFC group had a higher number of internalizing signs than did those in the MFC group,

TABLE 1. Descriptive Statistics on Demographic Information

	GSFC Group (<i>n</i> = 17)	MFC Group (<i>n</i> = 48)	Group Difference
Birth Outcomes			
Birth weight, g (<i>SD</i>)	2,943 (446.0)	2,740 (611.5)	$t = 1.21,$ $p = .23$
Gestational age, weeks (<i>SD</i>)	37.8 (1.3)	36.9 (2.4)	$t = 1.48,$ $p = .15$
Age at testing, months (<i>SD</i>)	55.2 (1.6)	54.6 (2.0)	$t = 1.11,$ $p = .27$
Gender			
Males	11	25	$\chi^2(1) = .81$
Females	6	23	$p = .37$
Ethnicity			
Romanian	11	30	$\chi^2(1) = .36$
Rroma	6	18	$p = .55$
Duration in Foster Care Days (<i>SD</i>)	667 (321.4)	962 (217.2)	$t = -4.22,$ $p < .001$

GSFC = government-sponsored foster care; MFC = MacArthur foster care.

and simple main effects analysis revealed that the interaction effect was explained by an intervention effect found in girls. Girls in the MFC group had significantly lower internalizing symptoms than did girls in the GSFC placement, $F(1, 28) = 17.51, p < .001, \eta^2 = .39$ (Figure 2). Conversely, boys did not differ in internalizing symptoms based on placement, $F(1, 35) = 0.12, p = .73, \eta^2 = .004$.

For signs of externalizing disorders, there was no main effect for foster care group, $F(1, 61) = 0.42, p = .52, \eta^2 = 0.01$, but there was a main effect for gender, $F(1, 61) = 4.67, p = .035, \eta^2 = 0.07$. Boys had higher externalizing symptoms than did girls ($M = 3.43, SE = 0.50$ vs. $M = 1.67, SE = 0.64$). In addition, the group \times gender interaction was not statistically significant, $F(1, 61) = 0.33, p = .57, \eta^2 = 0.01$.

For ADHD, there was a significant main effect of group, $F(1, 61) = 15.20, p < .001, \eta^2 = 0.20$, and a nonsignificant effect of gender, $F(1, 61) = 0.37, p = .54, \eta^2 = 0.01$. In addition, the group \times gender interaction was marginally significant, $F(1, 61) = 3.24, p = .077, \eta^2 = 0.05$. While children in the GSFC group had more signs of ADHD as compared to their MFC counterparts, this difference was significant only among girls, $F(1, 28) = 15.16, p = .001, \eta^2 = .36$, although a similar trend also was present in boys, $F(1, 35) = 2.60, p = .12, \eta^2 = .07$ (Figure 3).

Duration of Time Spent in Foster Care

Given that groups differed in the duration of time spent in foster care, we examined whether this variable was associated with the three domains of psychopathology. We found a significant association between more time in foster care and fewer signs of ADHD, $r = -.41, p < .001$, a marginal association with fewer

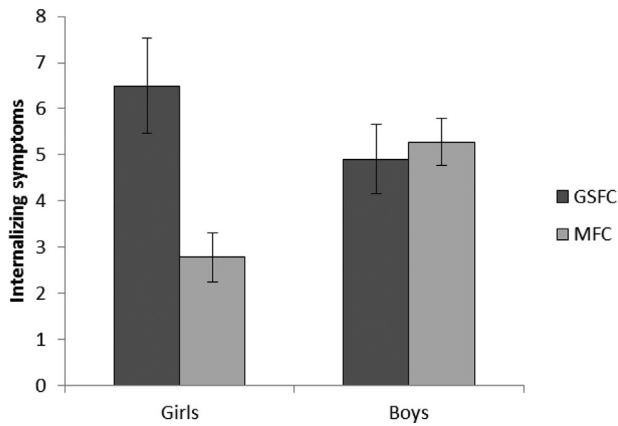


FIGURE 2. Internalizing symptomatology in girls and boys in the government-sponsored foster care and in McArthur foster care groups.

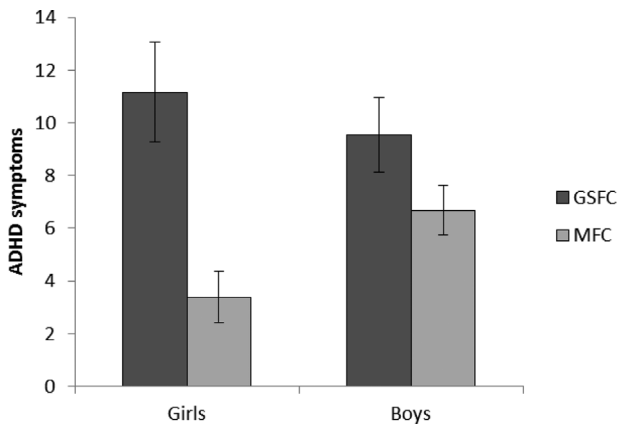


FIGURE 3. Attention deficit hyperactivity disorder symptoms in girls and boys in the government-sponsored foster care and in McArthur foster care groups.

signs of internalizing disorders, $r = -.21, p = .095$, but no significant association with signs of externalizing disorders, $r = -.13, p = .29$.

Psychopathology Outcomes by Foster Care Group and Gender

Given that MCF and GSFC children differed in the duration of time spent in foster care and that time in care has been linked to psychopathology, we conducted three 3-step, hierarchical linear regressions, one for each domain of psychopathology. In Step 1 of each model, gender and time spent in foster care were entered; in Step 2, we included foster care group; and in Step 3, we included the interaction term between group and gender. This procedure allowed for the determination of the effect of group after controlling for gender and duration of time in care and the ability to determine the size of any interaction effects.

For signs of internalizing disorders, after controlling for gender and time spent in foster care, group was not a significant predictor. Nevertheless, there was a significant group \times gender

TABLE 2. Prediction of Psychopathology at 54 Months

Variables	Internalizing		Externalizing		ADHD	
	ΔR^2	β	ΔR^2	β	ΔR^2	β
Step 1	.10*		.12		.18**	
Gender		.25 [†]		.34**		.12
Time Spent in Foster Care		-.13		-.03		-.37**
Step 2	.02		.00		.07*	
FCG (GSFC = 0, MFC = 1)		-.17		-.07		-.30*
Step 3	.10**		.01		.05 [†]	
FCG \times Gender		.73**		.16		.49 [†]
Total R ²	.22**		.13 [†]		.30***	

ADHD = attention-deficit/hyperactivity disorder; FCG = foster care group. [†] $p < .10$. * $p < .05$. ** $p = .01$. *** $p < .001$.

interaction, which explained an additional 10% of variance, $\beta = .73, p = .007$, over and above the effects of gender, time spent in foster care, and group status (see Table 2). Follow-up analyses of the interaction conducted separately within each gender revealed that the interaction was accounted for by a significant group effect in girls, $\beta = -.67, p < .001$, such that girls in the MFC group had significantly fewer internalizing signs than did those in GSFC. Conversely, the group effect in boys was not a significant predictor of internalizing signs, $\beta = .16, p = .43$.

For externalizing signs, after controlling for gender and duration in foster care, group was not a significant predictor. Likewise, the effect of the group \times gender interaction was not significant (Table 2).

For ADHD, after controlling for gender and time spent in foster care, group significantly predicted signs of ADHD, $\beta = -.30, p = .021$, adding 6.8% variance to the model. Furthermore, the interaction term entered in the final step was marginally significant, $\beta = .49, p = .055$, and explained an additional 4.5% of variance to the model over and above the effects of gender, time spent in foster care, and group status (Table 2). Follow-up analyses of the interaction conducted separately for each gender revealed that the marginal interaction was accounted for by a strong group effect in girls, $\beta = -.56, p = .003$, in which girls in the MFC group had significantly fewer signs of ADHD as compared to girls in GSFC. However, there was a nonsignificant group effect in boys, $\beta = -.08, p = .66$.

As a final step, to examine whether foster care group or duration of time spent in family care was a larger contributor to the variance in ADHD signs, we conducted two additional two-step, hierarchical linear regressions. In the first analysis, gender and time in foster care were entered in Step 1, and foster care group in Step 2. For this model, foster care group predicted an additional 6.8% of the variance in ADHD signs over and above the effect of gender and time in foster care, $p = .021$. In the second analysis, gender and foster care group were included in Step 1, and time in foster care in Step 2. The additional variance in ADHD signs explained

by time in care after controlling for gender and foster care group was marginally significant, $\Delta R^2 = 3.8\%$, $p = .085$.

We also examined the potential for group to moderate the association between duration of time in foster care and the psychopathology domains. All interaction terms were not significant, $ps > .71$, indicating that the association between length of time in foster care and psychopathology did not differ based on foster care type.

Psychopathology Outcomes in the GSFC Compared to Children in Institutions

We examined differences in symptomatology between the foster care groups and the group of CAUG children who were still living in institutions at 54 months. One-way ANOVAs with group (Institutionalized vs. GSFC vs. MFC) as a factor and each of the three symptom domains as dependent variables revealed an overall significant difference in signs of ADHD, $F(2, 84) = 12.40$, $p < .001$, but not internalizing, $F(2, 84) = 2.25$, $p = .11$, and externalizing, $F(2, 84) = 1.20$, $p = .31$, problems. Post hoc tests showed that contrary to our predictions, the institutionalized children had lower levels of ADHD symptoms than did both the MFC, M difference = 5.01, $SE = 1.28$, $p = .001$, and GSFC, M difference = 7.12, $SE = 1.46$, $p < .001$, children.

DISCUSSION

We examined psychopathology in 54-month-old children in foster care placements, all of whom had experienced abandonment and significant deprivation from prior institutionalization. This is the first study to date that has contrasted a specially designed foster care approach and GSFC in Romania in the post-Ceausescu era. We found that girls in MFC had fewer signs of internalizing disorders and ADHD as compared to those in GSFC whereas boys were roughly similar in all symptom domains between groups. The gender differences in this subsample also are similar to those reported in the larger BEIP sample (Zeanah et al., 2009). Girls' reduced symptomatology was mediated by security of attachment to their foster mothers (McLaughlin et al., 2012). The effects in the present study also may be due to girls' differential ability to form secure attachments to their foster mothers than the ability of boys to do so. In any case, these results are important because they suggest that with regard to reducing signs of ADHD, quality of foster care placement matters more than does length of time spent in foster care, although both appear to be meaningful contributors.

There are a number of reasons why children placed in the MacArthur foster families might have been more advantaged. First, the MFC network was carefully designed, developmentally sensitive, and well-supported, particularly emphasizing the importance of child-to-parent attachment (Smyke et al., 2009). MFC parents were encouraged to invest in their children as if they were their own. In contrast to this approach, GSFC parents were discouraged from attaching to children in their care because a future move might be more damaging if the children were attached (V. Ivascanu, personal

communication, February 12, 2013). Recent evidence from BEIP suggests that security of attachment is a key mediator in the link between early deprivation and later psychopathology (McGoron et al., 2012; McLaughlin et al., 2012), and that those children who were able to form secure attachments to their caregivers at 42 months showed fewer signs of psychiatric disorders at 54 months.

Second, the level of support MFC parents received was significantly greater than that in GSFC. Specifically, BEIP social workers visited each child at least twice a month whereas government social workers visited only once a month. In addition, BEIP social workers encouraged MFC parents to call them as needed. Being available to the family either in person or via the telephone whenever needed provided a sense of knowing where to turn to for advice. Moreover, MFC foster parents were offered support groups, providing information about children's challenging behaviors and discussing how best to respond. Social support is a demonstrated protective factor for foster parents; it also is associated with less problematic behaviors in the children (Denby, Rindfleisch, & Bean, 1999; T. Fisher, Gibbs, Sinclair, & Wilson, 2000). In contrast, foster parents in the state system were not able to meet with their peers and discuss their cases and reactions to them because of concerns about confidentiality (V. Ivascanu, personal communication, February 12, 2013). Finally, BEIP social workers benefited from an intensive program of training and supervision from U.S.-based clinicians, consisting of weekly conference calls, quarterly visits, and ongoing reflective supervision (Smyke et al., 2009). This training and support was not available to social workers in the GSFC system.

It is not immediately clear why the two foster care groups differed on signs of ADHD, but not externalizing disorders. One possibility is that foster care alone, without additional intervention efforts (e.g., parent-child interaction therapy; Chaffin et al., 2004), may be insufficiently powered to resolve or prevent ODD and CD in young children who are exposed to adversity. Though evidence-based approaches to externalizing problems in early childhood focus primarily on parenting strategies to change children's behavior, efforts to reduce oppositional and aggressive behavior in children from the extremes of adversity may require a more intensive and systematic approach than foster care alone was able to provide.

The effect of MFC on ADHD was a bit surprising because the prevalence of ADHD in the children placed in foster care was statistically indistinguishable from the children receiving care-as-usual in the BEIP (Zeanah et al., 2009). Some have speculated that ADHD that follows early deprivation may be different from typical ADHD symptomatology and may entail different neurobiological mechanisms (Sonuga-Barke & Rubia, 2008). Although the etiology for ADHD is often conceptualized to be primarily genetic (Faraone & Doyle, 2001), recent work has found that signs of ADHD are much higher in individuals who experienced abuse or neglect in childhood (e.g., Endo, Sugiyama, & Someya, 2006; Singer, Humphreys, & Lee, 2012). Thus, given that at least some ADHD symptomatology results from adverse environmental experiences, it is possible that interventions that aim to provide supportive, stable environments may target these same pathways.

Finally, it was surprising that children living in institutions had caregivers who reported no differences in signs of internalizing and externalizing signs as compared to children in either foster care group, but fewer signs of ADHD. This may reflect differences in settings in which the children were observed and known, or institutional caregivers may have minimized reporting signs of these disorders for any number of reasons. In any case, the basic findings here concern different models of foster care. Given that the two groups of foster mothers are more comparable reporters than are institutional caregivers and either group of foster mothers, the differences in those groups are especially noteworthy.

There are some limitations to this study. First, the sample size is small, particularly in the GSFC group; therefore, the findings should be considered preliminary. Second, we cannot ascertain if a selection bias existed regarding which children who had been originally randomized to care-as-usual but were removed from institutions and placed in government foster care. On the other hand, our observations over the past decade have suggested that more symptomatic children are often removed from foster families and placed in institutions rather than the other way around. Third, we cannot rule out the possible influence of other factors (e.g., prenatal events, genetic differences, etc.) that might have differentially contributed to differences in rates of psychopathology.

In conclusion, results from the present study underscore the importance of quality foster care interventions. Studies in the United States also have emphasized that augmentations to “treatment-as-usual” foster care can have substantial benefits on children’s attachment, cortisol, and behavior problems (Bernard, Dozier, Bick, & Carlson, 2012; P.A. Fisher & Kim, 2007; P.A. Fisher, Stoolmiller, Gunnar, & Burraston, 2007). Together with our results, these findings underscore the importance of quality caregiving experiences for young children who have experienced adversity. Investing in high-quality foster care, informed by developmental and prevention science, should be a priority of child protection systems in countries struggling to care for orphaned, abandoned, and maltreated children.

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