Family environment and attention-deficit/hyperactivity disorder in adopted children: associations with family cohesion and adaptability

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Accepted for publication 7 September 2013

Abstract

Background Positive family environments are crucial in promoting children’s emotional and behavioural well-being, and may also buffer development of attention-deficit/hyperactivity disorder (ADHD). ADHD is highly heritable, but psychosocial factors in the family environment, particularly family cohesion and communication, may mediate genetic predispositions. The purpose of the current study is to examine the mediating influence of the adoptive family environment between pre-adoptive risk factors and youths’ ADHD symptomatology at 14 years post adoption.

Methods The data used in this study were obtained from the fourth wave of the California Long-Range Adoption Study (CLAS) (n = 449). Using structural equation modelling (SEM), family sense of coherence and family adaptability were tested as possible mediators between environmental and biological predictors and ADHD symptomatology. Predictors included birthweight, gender, age at adoption, adoption from foster care, transracial adoption status, ethnicity and having a previous diagnosis of ADHD.

Results Results show that, while adoption from foster care is negatively associated with family functioning, higher family cohesion and adaptability mediate this influence on children’s ADHD symptomatology. Older age of adoption directly predicts greater ADHD symptoms with no mediating influence of the family environment.

Conclusions The mediating influence of the family environment between children’s risk factors and ADHD symptoms suggests that family intervention strategies may be helpful in improving adopted children’s outcomes. Once children are adopted, targeting family communication patterns and dynamics may be an additional part of developing an evidence-based, post-adoption services toolkit.

Introduction

Positive family environments are crucial in promoting children’s emotional and behavioural well-being, and may also buffer development of attention-deficit/hyperactivity disorder (ADHD) (Mulligan et al. 2011). The term ‘family environment’ encompasses multiple, closely related concepts, including family conflict (Jaycox & Repetti 1993), family cohesion (Moos & Moos 1994) and family coherence and adaptability (Antonovsky & Sourani 1988), and generally refers to families where members are mutually supportive within a predictable and nurturing environment. In regards to ADHD, research has shown that, while ADHD has a strong genetic component (Burt 2009), psychosocial adversity in the family
environment may trigger an underlying predisposition (Biederman 2005).

ADHD is characterized by inattention (daydreaming, difficulty focusing on a single task, distractibility) and hyperactivity (excessive talking, fidgeting, restlessness; Biederman 2005). It is often difficult to determine whether these symptoms are the causes or consequences of a dysfunctional family environment (Howe 2010), as biological traits – such as shared ADHD between parents and children – contribute to environmental conditions that reinforce children’s symptoms (Cadoret et al. 1995; Leve et al. 2010b). Given the absence of genetic links in an adoptive family, the influence of a chaotic family environment related to parental psychopathology (Biederman et al. 2002; Schroeder & Kelly 2009), has, in theory, been isolated (Cadoret et al. 1995; Leve et al. 2010b). Yet, while data are scarce, estimates of ADHD prevalence in adopted children may be much higher than the general population: 21.8% (Simmel et al. 2001) compared with 3–8% of school-aged children (Foley 2010), and 5.29% worldwide (Polanczyk et al. 2007). The purpose of the current study is to examine the relationship of the family environment, above and beyond pre-adoptive risk factors, with ADHD symptomatology among 449 adopted youths.

The influence of the family environment

Measures of family environment are strongly associated with children’s behaviour problems, beyond biological and other psychosocial risk factors (Lucia & Breslau 2006). Higher family cohesion has been associated with lower internalizing and externalizing behaviours in children (Henderson et al. 2003), and lower rates of depression and anxiety among adolescents (Burt et al. 1988). In a study of children adopted from orphanages in the Soviet Union (McGuiness et al. 2005), only low birthweight and family cohesion significantly predicted variation in children’s behavioural problems.

Studies of the family environment’s influence on ADHD have shown similar patterns to other child well-being indicators (Biederman 2005), but with a strong genetic component (Lifford et al. 2008; Leve et al. 2010a). In a review of 20 twin studies, Faraone and colleagues (2005) found that shared genes accounted for 76% of ADHD heritability. Some researchers posit that adverse environments may trigger the underlying condition (Biederman 2005) such that a gene–environment interaction exists (Leve et al. 2010b). Burt and colleagues (2003), for example, found that parent–child conflict is a risk factor for several externalizing disorders in children, including ADHD, but that co-morbidity is likely related to psychopathology within the family environment. Thus, while it is difficult to disentangle whether ADHD is the cause or result of factors within the family environment (Howe 2010), clearly the environment plays an important role in the course of developing symptomatology.

Family environmental contributors to ADHD

Several studies have shown higher rates of family dysfunction in families with children diagnosed with ADHD, particularly related to problems in communication, relationships and problem solving (Cunningham & Boyle 2002), higher family conflict and lower levels of organization (Foley 2010; Mulligan et al. 2011). Some of these problems may be related to parental psychopathology, or poor parenting practices (Cunningham & Boyle 2002; Deault 2010) possibly related to parental ADHD symptoms (Daley 2006).

Among adoptive families, Cadoret and colleagues (1995) found that children with an antisocial birth parent – who also experience negative adoptive family interactions – are at greater risk for aggressive behaviours. Research by Leve and colleagues (2010b) showed that adoptive mothers’ affective states moderated the relationship between birth parents’ and adopted children’s externalizing problems. Similarly, Tully and colleagues (2008) found that maternal depression significantly predicted children’s depression and externalizing behaviour problems for both groups, regardless of adoption status. These studies seem to confirm the importance of the family environment on children’s well-being above and beyond biological similarities between parents and children, a finding particularly relevant for this current study of adopted children.

Research questions

This study uses two validated, related measures of the family environment – family adaptability and family sense of coherence (Antonovsky & Sourani 1988) – and is guided by two research questions: (1) To what extent does family cohesion mediate the relationship between key biological and environmental predictors, such as birthweight, age at adoption, foster care status, and ADHD symptomatology for adopted children? And (2) To what extent does family adaptability mediate the relationship between these biological and environmental predictors, and ADHD symptomatology?

Methods

Sample

The data used in this study were obtained from the California Long-Range Adoption Study (CLAS). Analysis for this study
was conducted on the final wave of these data collected for children adopted in California between July 1988 and June 1989. Respondents were adoptive parents instructed to complete the survey for only one adopted child. Data collection for this study began in the summer of 2003 and was completed by 2004, approximately 14 years after the children were adopted. Questionnaires were mailed to 956 adoptive parents for which researchers had contact information from the original study population ($n = 1219$), asking for information about various aspects of adoption, including child characteristics and outcomes for adopted children. Parents completed questionnaires for 469 children, representing 49.0% of the mailed questionnaires. Of these, two respondents had missing information on their adoptive child’s ADHD diagnosis, and an additional 18 had missing information on a current assessment of inattention and hyperactivity, captured by the Conner’s Parent Rating Scale-Revised (CPRS-R), the dependent variable of the study. These cases were removed for a final study sample of $n = 449$.

Most respondents were mothers (80.6%), married or cohabitating (86.2%), white (81.1%), had a 4-year college degree or higher (67.3%), and nearly half were employed full time (44.8%; see Table 1). The mean number of biological children in the family was 0.7 (SD = 1.1) and the mean number of adopted children was 1.7 (SD = 1.0). For child characteristics (see Table 2), children were nearly evenly split between males and females. On average, children were 3.4 years old (SD = 2.5) at the time of adoption, and 16.7 years old (SD = 2.5) at the time of the study.

### Measures

#### Demographic variables

Respondent characteristics included respondent type (adoptive mother/father); marital status (married/cohabitating; divorced/separated; single/widowed); respondent ethnicity (White/...
Latino/Other); education (high school/vocational school/community college/4-year college or above); employment status (full-time/part-time/retired/not employed); and the number of children in the home (for biological and adopted children). Child characteristics included gender (male/female); age (in years); having ever received a diagnosis of ADHD (yes/no, by parental report; no other information was available regarding by whom this diagnosis was given, or when); birthweight (ounces); ethnicity (White/Latino/Asian/Black/Other); whether the adoption were transracial (yes/no); and how the child was initially adopted (independently of an agency; through a private agency; through a public child welfare agency, i.e. foster care). Measures also included three standardized instruments, described below.

**Family sense of coherence (FSOC)**

The FSOC consists of 26 Likert scale items, each ranging from 1 to 7, and measures the extent to which the family is structured, explainable and predictable; that resources exist to meet demands; and that demands pose worthwhile challenges to the family (Antonovsky & Sourani 1988). The FSOC has been used across a variety of settings and populations, including children’s health (Eriksson & Lindstrom 2006) and the psychosocial adjustment of adopted children (Ji et al. 2010). Previous studies suggest that internal consistency for this scale is high (Antonovsky & Sourani 1988). Results on the reliability of this scale suggest good internal consistency in the current sample ($\alpha = 0.90$).

**Family adaptability scale (FAS)**

The FAS consists of 10 Likert scale items, each ranging from 1 to 7, and measures families’ satisfaction with the fit between individual family members and the family, and between the family and the larger community. The internal consistency of the FAS is fairly high in previous studies (Antonovsky & Sourani 1988), and performs well in the current sample ($\alpha = 0.88$). Evidence

### Table 2. Child characteristics and scale means*

<table>
<thead>
<tr>
<th></th>
<th>Full sample (N = 449)</th>
<th>Scale means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n or M (SD)</td>
<td>%</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>218</td>
<td>48.6</td>
</tr>
<tr>
<td>Male</td>
<td>231</td>
<td>51.4</td>
</tr>
<tr>
<td><strong>Mean age (years)</strong></td>
<td>16.7 (2.5)</td>
<td>-</td>
</tr>
<tr>
<td><strong>Mean age at Wave 1</strong></td>
<td>3.4 (2.5)</td>
<td>-</td>
</tr>
<tr>
<td><strong>Age of child at Wave 1 (categorized)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0–1.9</td>
<td>143</td>
<td>31.8</td>
</tr>
<tr>
<td>2–2.9</td>
<td>117</td>
<td>26.1</td>
</tr>
<tr>
<td>3–5.9</td>
<td>86</td>
<td>19.2</td>
</tr>
<tr>
<td>6 or over</td>
<td>55</td>
<td>12.2</td>
</tr>
<tr>
<td><strong>ADHD diagnosis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>149</td>
<td>33.2</td>
</tr>
<tr>
<td>No</td>
<td>300</td>
<td>66.8</td>
</tr>
<tr>
<td><strong>Birthweight (ounces)</strong></td>
<td>111.5 (21.4)</td>
<td>-</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>247</td>
<td>55.0</td>
</tr>
<tr>
<td>Latino/a</td>
<td>80</td>
<td>17.8</td>
</tr>
<tr>
<td>Asian</td>
<td>38</td>
<td>8.5</td>
</tr>
<tr>
<td>Black</td>
<td>28</td>
<td>6.2</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>1.1</td>
</tr>
<tr>
<td><strong>Transracial (vs. no)</strong></td>
<td>131</td>
<td>29.2</td>
</tr>
<tr>
<td><strong>How adopted</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Independently</td>
<td>220</td>
<td>49.0</td>
</tr>
<tr>
<td>Public agency (foster care)</td>
<td>133</td>
<td>29.6</td>
</tr>
<tr>
<td>Private agency</td>
<td>48</td>
<td>10.7</td>
</tr>
</tbody>
</table>

*Percentages may not total 100% because of missing data.

*P < 0.05 for FSOC; *P < 0.05 for FAS; *P < 0.05 for CPRS-R.

ADHD, attention-deficit/hyperactivity disorder; CPRS-R, Conner’s Parent Rating Scale-Revised; FAS, family adaptability scale; FSOC, family sense of coherence.
suggests that the constructs measured by the FSOC and FAS, while conceptually distinct, are highly correlated.

**Conner’s Parent Rating Scale-Revised (CPRS-R)**

The CPRS-R is designed to assess ADHD symptomatology in children (Conners et al. 1998). The CPRS-R consists of 27 Likert scale items, ranging from 0 to 3, with overall scores ranging from 0 to 81. Raw scores of 15 and higher or standardized T scores over 65 are indicative of a clinical ADHD diagnosis (Conners 1997). The mean raw score for the current sample is 22.1 (18.0) indicating, on average, high ADHD symptomatology. The CPRS-R has demonstrated high internal consistency with Cronbach’s alpha ranging from 0.88 to 0.96 (Conners et al. 1998). In the current study, the CPRS-R demonstrated excellent reliability (\(\alpha = 0.97\)).

**Analysis**

Multiple imputation using SAS 9.2 was performed on items from each of the mediating measurements separately (FSOC, FAS), using responses to estimate imputations for missing values with individual items (Yuan 2000; Acock 2005). Even though the CPRS-R has been used by clinicians to help with making a diagnosis of ADHD, for the purposes of this study, the diagnosis of ADHD was made temporally prior to collection of these data, and thus should be treated as a predictor. The first path model included the following predictors as exogenous variables: family marital status; adoptive parents’ educational attainment; child’s gender; child’s race (Other vs. White); birthweight in ounces; the numbers of biological and adoptive children in the family respectively; age at adoption; adoption from foster care; and having a diagnosis of ADHD prior to the study. Family coherence (FSOC) and family adaptability (FAS) were specified as mediators in this analysis. Based on the results of the first model (see Fig. 1), the researchers modified the specification of the analysis by removing all non-significant paths (Letzter-Pouw & Werner 2012) and formulated competing models to assess and compare their overall goodness of fit, meaningfulness for interpretation, and explanatory power. A final model is presented in Fig. 2.

**Results**

The initial model, which included all predictors, with the FSOC and the FAS as mediators, yielded poor goodness of fit statistics.
$\chi^2 = 254.44$, d.f. = 1, $P < 0.00001$, root mean square error of approximation (RMSEA) = 0.78, 90% confidence interval for RMSEA = (0.68; 0.88), $P$-value for test of Close Fit (RMSEA < 0.0001) = 0.95, normed fit index (NFI) = 0.66, non-normed fit index (NNFI) = −23.17, confirmatory fit index (CFI) = 0.63, critical $n = 8.48$, standardized root mean square residuals (RMR) = 13.86, goodness of fit index (GFI) = 0.91, adjusted GFI index (AGFI) = −5.96. Results from bivariate analyses indicated that birthweight, ethnicity and transracial adoption status were not significantly associated with any standardized measures (FSOC, FAS, CPRS-R) in this study. Sensitivity testing was conducted on the original data as well as the imputed values for these variables, and the results indicated that these factors remained non-significant in predicting both the mediators (FAS and FSOC) or the final dependent variable (CPRS-R). From the evidence of the analysis, birthweight, ethnicity and transracial adoption status were dropped in the specification for the final model.

**FSOC and FAS**

Results suggest that four of the predictors (family coherence, family adaptability, diagnosis of ADHD, age at adoption) were statistically significant in predicting hyperactivity as measured by the CPRS-R when controlling for all other variables in the initial model and the final model. Both family coherence and family adaptability were in turn significantly predicted by ADHD and foster status, but not age at adoption.

In the final structural model (see Fig. 2), measurement errors from the FSOC and FAS were also allowed to correlate, based on the high degree of shared variance. Family coherence and family adaptability were specified as predictors of the CPRS-R. The specified final model appears to have a good overall fit with the data $\chi^2 = 0.75$, d.f. = 3, $P = 0.86$, RMSEA < 0.001, 90% confidence interval for RMSEA = (0.001; 0.049), $P$-value for test of Close Fit (RMSEA < 0.05) = 0.95, NFI = 1.00, NNFI = 1.02, CFI = 1.00, critical $n = 5118.17$, standardized RMR = 0.0092, GFI = 1.00, AGFI = 0.99).

For our structural regression model (see Fig. 2), FSOC and family adaptability emerged as direct predictors which buffers the effect of hyperactivity as measured by the CPRS-R (FSOC, direct effect = −0.27; FAS, direct effect = −0.11). The results also support the hypotheses that they are mediators to hyperactivity, from the effects of both a diagnosis of ADHD and adoption from foster care (see Table 3). The results support the hypotheses that family coherence and adaptability may buffer the deleterious impact of foster status and a diagnosis of ADHD on children’s hyperactivity. Factors such as birthweight, transracial adoption status and ethnicity did not...
emerge as significant predictors either for the final endogenous variable (CPRS-R) or for the mediators (FSOC and FAS).

**Discussion and implications**

A strength of the current study is the ability to examine long-term outcomes for adopted children involved in CLAS at 14 years post adoption. Results suggest the importance of the family environment on adopted children’s outcomes and support the gene–environment model of ADHD aetiology (Leve et al. 2010b). Contrary to earlier research (Mick et al. 2002; McGuiness et al. 2005), this study found no significant relationships between birthweight and ADHD symptomatology. Rather, family coherence and adaptability emerged as the strongest predictors.

The negative correlations between ADHD symptomatology and family coherence and adaptability support earlier research concerning these relationships (Schroeder & Kelly 2009; Mulligan et al. 2011). Importantly, compared with FSOC scale norms, both mothers and fathers in the current study scored higher than those in Antonovsky and Sourani's (1988) original study of FSOC (M = 128.63, SD = 33.35 for husbands; M = 130.85, SD = 33.99 for wives). The current sample thus is more optimistic about their family coherence.

The family environment emerged as a significant mediator between adoption from foster care and ADHD symptomatology. Earlier work by Rutter and colleagues (1975) found that adoption from foster care constituted one of several indicators of risk which, in aggregate, predict greater psychopathology in children. This work was later confirmed by Biederman and colleagues (1995) who also found that adverse family environments, and particularly low family cohesion, predicted higher rates of ADHD. The current study adds to this body of work by demonstrating that the risk of ADHD symptomatology posed to children adopted from foster care may be buffered by strong family cohesion and adaptability.

In contrast, older age at the time of adoption emerged as a direct risk factor for increased ADHD symptoms, and family environment did not appear to mediate this risk. This finding is somewhat contrary to past research on adoptees which found that family cohesion – and birthweight, which did not emerge as a statistically significant effect in this study, directly or indirectly – accounted for the greatest variation in children’s behaviours, above and beyond the age of the child (McGuiness et al. 2005). Older adopted children are more generally at highest risk for emotional and behavioural problems (Berry & Barth 1990), but the lack of research specific to older adopted children’s ADHD makes it difficult to contextualize the results of the current study. It is possible that, as children get older, ADHD symptomatology becomes less responsive to changes in the family environment upon adoption. Such a finding may suggest a developmental window for intervening in adopted children’s ADHD symptoms, perhaps through early intervention.

The association between family structure and ADHD partially confirmed earlier research which found that having a non-intact structure contributed to ADHD symptoms (Hurtig et al. 2005; Forssman et al. 2009). In this sample, married couples scored higher in family coherence than divorced/separated or single/widowed couples. Yet, no significant direct or indirect relationships emerged between marital status of the parents and the ADHD symptoms of a child.

**Limitations**

While this study draws data from a longitudinal investigation, it is limited in its use of only one wave of study for which the measures of interest were available. Thus, it is not possible to establish with certainty the directionality of effects between family environment and ADHD. No information was available related to the child’s medication status for ADHD, a variable that may have important implications for child and family functioning. The response rate of 49.0% for Wave 4 of CLAS represents 38.5% of the Wave 1 sample; this sample may be biased such that families with higher cohesion and adaptability may have been more likely to respond. The sample is also primarily White, well-educated and middle class, such that the findings may not be generalizable to more diverse populations or to earlier CLAS waves. We conducted an attrition analysis and

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**Table 3.** Standardized direct, indirect and total effects for endogenous variables

<table>
<thead>
<tr>
<th>Endogenous variable</th>
<th>Predictor variables</th>
<th>Direct effects</th>
<th>Indirect effects</th>
<th>Total effects</th>
<th>$r^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPRS-R</td>
<td>FSOC</td>
<td>$-0.27^{**}$</td>
<td>NA</td>
<td>$-0.27$</td>
<td>0.42</td>
</tr>
<tr>
<td></td>
<td>FAS</td>
<td>$-0.11^{**}$</td>
<td>NA</td>
<td>$-0.11$</td>
<td>0.42</td>
</tr>
<tr>
<td></td>
<td>ADHD diagnosis</td>
<td>0.48***</td>
<td>0.14</td>
<td>0.62</td>
<td>0.42</td>
</tr>
<tr>
<td></td>
<td>Adoption from foster care</td>
<td>NA</td>
<td>0.05</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Age at adoption</td>
<td>0.11**</td>
<td>NA</td>
<td>0.11</td>
<td>0.42</td>
</tr>
<tr>
<td>FSOC</td>
<td>ADHD diagnosis</td>
<td>$-0.37^{**}$</td>
<td>NA</td>
<td>$-0.37$</td>
<td>0.15</td>
</tr>
<tr>
<td></td>
<td>Foster status</td>
<td>$-0.12^{*}$</td>
<td>NA</td>
<td>$-0.12$</td>
<td>0.15</td>
</tr>
<tr>
<td>FAS</td>
<td>ADHD diagnosis</td>
<td>$-0.37^{**}$</td>
<td>NA</td>
<td>$-0.37$</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td>Foster status</td>
<td>$-0.14^{*}$</td>
<td>NA</td>
<td>$-0.14$</td>
<td>0.16</td>
</tr>
</tbody>
</table>

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

ADHD, attention-deficit/hyperactivity disorder; CPRS-R, Conner’s Parent Rating Scale-Revised; FAS, family adaptability scale; FSOC, family sense of coherence.
found that those in Wave 4 tended to have a higher income at Wave 2 \( (P < 0.001) \) and a higher level of education at Wave 3 \( (P < 0.001) \). Another limitation is the sole reliance on adoptive parent reports of ADHD symptomatology. While this sample of adopted children provides a unique opportunity to examine the relationship between family environment and ADHD in adoptive families, no non-adoptive families were available for comparison.

**Conclusion**

The significant mediating influence of the family environment suggests that family intervention strategies may be helpful in improving adopted children’s outcomes. Several studies have shown that parents of children with ADHD frequently display elements of authoritarian parenting, versus authoritative parenting \( \text{(e.g. Hinshaw et al. 1997; Hurt et al. 2007)} \), and that positive parenting styles are associated with children’s self-regulation and attention \( \text{(Eisenberg et al. 2005; Kawabata et al. 2012)} \). Some have argued for early intervention parent training programmes targeted towards pre-school-aged children \( \text{(Daley et al. 2011)} \), and at least one study suggests that positive parenting training may help decrease young children’s behaviour problems \( \text{(Bor et al. 2002)} \).

Yet, other research indicates that parent involvement programmes are more helpful in reducing internalizing behaviours, and less so with externalizing issues and ADHD \( \text{(Corcoran & Dattalo 2006)} \). Deault (2010) notes the lack of attention given to parental factors that promote resilience in children, as opposed to dysfunction. This lack of research may contribute to a relative absence of early intervention approaches to addressing ADHD in early childhood \( \text{(Sonuga-Barke et al. 2011)} \), an approach that may be worthwhile given the environmental influences seen to be prevalent in its aetiology \( \text{(Sonuga-Barke & Halperin 2010)} \) or as triggers to an underlying predisposition \( \text{(Leve et al. 2010a)} \). One promising approach to treating ADHD in young children may be The Incredible Years (TIY) parent and child training programme which shows promise in fostering parenting changes in mothers and positive behavioural changes in children \( \text{(Webster-Stratton et al. 2011)} \).

A related issue for adoptive families is the lack of post-adoption services available to help families avert, or resolve, crises that may occur. Scholars and advocates have highlighted this important lack of services for several years \( \text{(Barth & Miller 2000)} \), while little has changed in the adoption field in providing supports to adoptive families \( \text{(Smith 2010)} \). Early intervention approaches that target cognitive development for young children in care \( \text{(e.g. Nelson et al. 2007)} \) may constitute a preventative approach prior to children’s adoption. Once children are adopted, targeting family communication patterns and perceptions of the family environment may be an additional part of developing an evidence-based, post-adoption services toolkit.

**Key messages**

- Research shows that psychosocial factors in the family environment, particularly family cohesion and communication, may mediate genetic predispositions to ADHD.
- This study of adopted children found that family cohesion and adaptability mediated the relationship between pre-adoptive risk factors and ADHD symptomatology at 14 years post adoption.
- These findings suggest that family intervention strategies, focused on family communication patterns and dynamics, may be helpful in improving adopted children’s outcomes and building an evidence base for post-adoption services.

**References**


