Understanding contextual effects on externalizing behaviors in children in out-of-home care: Influence of workers and foster families[☆],[☆☆]

Connie Cheung [a,*], Deborah Goodman [b], George Leckie [c], Jennifer M. Jenkins [a]

[a] University of Toronto, Department of Human Development and Applied Psychology, 252 Bloor Street West, Toronto, Ontario, Canada M5S 1V6
[b] Child Welfare Institute of the Children's Aid Society of Toronto, 30 Isabella Street, Toronto, ON, Canada M4Y 1N1
[c] University of Bristol, The Centre for Multilevel Modelling, 2 Priory Road, Bristol BS8 1TX, UK

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ABSTRACT

The expression of externalizing behaviors of children in-care can be influenced by a multitude of factors. The current study examined the simultaneous levels of influence of workers and foster families on children's externalizing behaviors in those receiving out-of-home care. A cross-classified multilevel model was used to partition variance in children in-care's externalizing scores into worker, foster family and child-specific levels of influence. The extent to which processes are explained by worker and foster-family level predictors was examined. Assessment and Action Record (AAR) data from the Ontario Looking after Children (OnLAC) project were analyzed. The sample included data from 1063 children between 10 and 17 years of age (M age $=$ 13 years, 6 months, $SD =$ 2.08 years). While individual differences in children's externalizing behaviors were primarily attributable to child-specific effects (72%), 10% and 18% of the variance can be explained by worker and foster family influences respectively. Worker education accounted for substantial differences seen between workers where more difficult children were monitored by workers with less educational attainment. Furthermore, foster-family level predictors also explained variance in children's externalizing behaviors. Relative to children in foster care, those in kinship care displayed significantly lower levels of problem behaviors while children in group care displayed significantly higher levels. Higher levels of parental negativity within the foster family and the experience of more differential parental negativity relative to siblings were significantly associated with more externalizing behaviors. Lastly, children who were more satisfied with their placement displayed significantly lower levels of problematic behaviors. These results suggest that children in-care can be conceptualized within a multilevel framework.

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1. Introduction

Approximately 67,000 Canadian children, some with a history of maltreatment, experience out-of-home care each year (Mulcahy & Trocmé, 2010). These children show increased problems on a range of behaviors including externalizing behaviors, or behaviors that are overtly disruptive (e.g., violation of societal norms, destruction of property, harm towards others, e.g., Hinshaw, 1987). While difficulties remain in differentiating selection effects (i.e., children with higher externalizing behaviors are more likely to be placed in care), from causal influences (i.e., the experience of being in care increases children's externalizing behaviors), existing research suggests that children in-care are consistently more vulnerable to externalizing problems than children residing with biological parents. When compared to children living with biological parents, children who receive out-of-home care were more likely to show significantly higher rates of problematic behaviors (e.g., Lawrence, Carlson, & Egeland, 2006, see Keil & Price, 2006 for a review). Estimates by Keil and Price (2006) suggest that 42% of children in-care fall within the clinical range for externalizing behaviors. These findings are particularly concerning since children in-care with higher rates of hard-to-manage behaviors are also more likely to experience placement disruptions, which further increases their risk of problematic behaviors (e.g., Newton, Litrownik, & Landsverk, 2000).

Despite a strong association between externalizing problems and the experience of out-of-home care, a large degree of individual variation remains. A portion of the variation is related to characteristics of individual children. Indeed, existing studies have demonstrated that younger children relative to older children, boys relative to girls, and children with lower cognitive ability relative to those with higher cognitive abilities are more likely to show higher levels of externalizing behaviors (Attar-Schwartz, 2008; Proctor, Skriner, Roesch, & Litrownik, 2010; Rosenthal & Curiel, 2006). Additionally, children's own unique experiences have also been found to relate to externalizing behaviors. For example, children with a history of abuse and/or maltreatment who have experienced a higher number of foster-care placement disruptions (Aarons et al., 2010; Oosterman, Schuengal, Slot, Bullens, & Doreleijers, 2007), sexual abuse (Pears, Kim, & Fisher, 2008; Tarren-Sweeney, 2008), or harsh or authoritarian parenting (Jaffee, Caspi, Moffitt, Polo-Tomas, & Taylor, 2007; Perkins-Mangulabnan & Flynn, 2006) are more likely to show higher levels of problematic behaviors.

Aside from child-specific factors, individual variability in externalizing behaviors may be related to the contexts in which children in-care live. A number of foster-parent characteristics have been found to predict higher levels of externalizing behaviors in children in-care. Foster parents, such as those with more health concerns (e.g., Tarren-Sweeney, 2008) and those who have no biological-relatedness to the child in-care (e.g., Holtan, Ronning, Handergard, & Sourander, 2005) are more likely to care for children with higher externalizing scores. Moreover, there is evidence that suggest the neighborhood in which a child lives is also related to externalizing outcomes. Children who have experienced abuse and/or maltreatment and live in neighborhoods characterized by low social cohesion and informal social control are also more likely to display higher levels of externalizing behaviors (Jaffee et al., 2007).

1.1. Understanding child in-care outcomes from a multilevel perspective

It appears that both child-specific and contextual factors are associated with externalizing behaviors of children in-care. While many of these studies do not distinguish selection effects from causal influences, existing research raises important questions about how child-specific and contextual factors operate together in their association with children in-care's externalizing behaviors. Perhaps this can best be understood through an ecological perspective.

According to Bronfenbrenner (1979), development occurs within a multilevel framework where children are directly or indirectly influenced by different contextual factors that are embedded within multiple layers of their social context. Factors that exist in layers closest to the child (e.g., family factors) are assumed to have stronger influences on development than more distal factors such as communities, agencies, and schools.

Understanding the extent that children show similarities in their behavior within families, communities or schools informs us about how to target and organize policy, programs and service delivery. For instance, if a study finds that most of the variance in children's externalizing behaviors occur because of differences between schools (i.e., children cluster within schools and some schools have much higher rates of problems than other schools), then it seems reasonable to either examine school processes that may influence child behavior or examine school assignments that may explain why more difficult children are assigned to one school rather than another. Multilevel studies are of importance because they show us the way in which variance is partitioned across multiple contexts in which children grow-up.

To date, the extent to which the multilevel framework has been adapted to understand externalizing outcomes in children in-care has been relatively sparse. However, there is some preliminary evidence which suggests that children in-care cluster as a function of both child- and agency-specific effects. Drawing on national data from the United States of 6228 children and youth in-care between the ages of 4–18 years, Rosenthal and Curiel (2006) demonstrated that after accounting for different data collection time points, differences between agencies and children in-care account for different patterns in externalizing behaviors. Similarly, multilevel data from an Israeli sample of 4420 children receiving institutionalized care between the ages of 6–18 years replicated earlier findings. Specifically, 12% of the variance in children in-care's externalizing behaviors was explained by agency-level effects (Attar-Schwartz, 2008). Differences between agencies may in part, account for differences in children in-care's externalizing behaviors, suggesting that there are multiple layers of influence on children in-care's hard-to-manage behaviors.

Although some studies have examined the effects of foster family level correlates, none have examined the foster family as a level of influence. Drawing on studies that sample children from the community, families have been shown to be central in understanding children's outcomes. For instance, Rasbash, Leckie, Pillinger, and Jenkins (2010) found that 41% of the variance in change in school achievement among children between 11 and 16 years of age can be attributed to the family. Similarly, Jenkins, Simpson, Dunn, Rasbash, and O'Connor (2005) also found that between 15 and 40% of the variance in children's behavior problems can be explained by family membership. To date, family-level influences on children's externalizing behaviors remain consistent across multiple studies (e.g., Romano, Tremblay, Boulerice, & Swisher, 2005). Evidently, the family appears to be an important level of influence on children's outcomes.

Children in-care face a unique set of circumstances where workers and foster parents monitor and provide their care. Therefore, children in-care's development may be influenced by the foster family in which they live while simultaneously being influenced by the worker who monitors their care. Understanding the influence of the worker on child outcomes in children in-care is important because differences between workers can be related to outcomes in children in-care. There is some preliminary evidence to suggest that differences between workers may account for differences in the length of time children spend in care. Specifically, workers with a Masters of Social Work designation were more likely to work with children who spend less time in-care (Ryan, Garnier, Zyphur, & Zhai, 2006). Evidently, by modeling the simultaneous effects of workers and foster families, we can gain a better understanding of how these levels of influence relate to outcomes in children in-care.

To understand the role of different contexts in children in-care's externalizing behaviors, researchers must simultaneously examine each context. Nested data structures, such as children in-care nested within workers or children in-care nested within foster families, pose some unique analytical considerations. Traditional statistical methods (e.g., standard regression analysis) cannot adequately account for the correlation of children within groups. An important consequence is that the standard errors for group-level variables are typically underestimated. Often, researchers falsely report contextual effects as significant (i.e., type 1 errors). Multilevel modeling techniques (e.g. Goldstein, 2010; Raudenbush & Bryk, 2002; Snijders & Bosker, 1999) have been developed to analyze hierarchical data structures in which observational multiple units are nested within higher order unit groups (e.g., children within families). Often, however, children's contexts are more complicated than a simple hierarchical structure and cross-classified multilevel models have been developed for these more complex structures (Rasbash & Goldstein, 1994; Raudenbush, 1993). For instance, when we have multiple children-in-care living in the same foster family then children in-care are nested within foster families. However, foster family- and worker-levels are crossed since different workers may monitor children in-care living in the same foster family. Similarly, workers tend to monitor children in-care from multiple foster families. Cross-classified models allow us to partition variance into worker, foster family and child-specific sources of influence while accounting for the cross-over between workers and foster families.

Through the inclusion of predictor variables we can then try to explain variance in our different classifications (worker, foster family, child in-care). For the current study, we were interested in examining whether worker characteristics such as worker education accounted for why children in-care who are monitored by different workers showed different externalizing outcomes. Similarly, at the family-level, we examined whether the type of foster-care placement (i.e., kinship, foster, and group care) and parental negativity can explain why foster siblings from the same foster family showed different patterns of externalizing behaviors. Lastly, we examined whether children in-care's own unique experiences with their foster-care placement (i.e., quality of foster-care placement) explained differences in externalizing behaviors.

1.2. Worker-level characteristics

1.2.1. Worker education

Understanding the effects of worker education on child outcome in children in-care is an emerging area in child-welfare research. This is an important area of study since worker education may affect the nature, amount and quality of services children in-care receive. For instance, workers with more formal training in child welfare may be better equipped to deal with work demands (Rittner & Wodarski, 1999). Indeed, more formal worker education has been found to relate to better job performance (e.g., Franke, Bagdasaryan, & Furman, 2009). Thus, workers with more formal training may be better able to provide contexts for children in-care that support their development.

To our knowledge, the relationship between worker education and children in-care's externalizing behaviors has not been examined. However, there are several reasons to suspect that worker education may be related to externalizing behaviors in children in-care. Preliminary research suggests that workers with more formal training are more likely to work with children who spend less time in the child-welfare system (Ryan et al., 2006), which may itself reduce the risk of externalizing behaviors. However, given the cross-sectional nature of the study, it is difficult to determine the directionality of the relationship (e.g., whether workers with more formal education are assigned to work with children in-care with less difficulty or whether they are actually more effective in working with these children in-care).

1.3. Family level processes

1.3.1. Type of foster care placement

When examining the effects of type of foster care placement on children in-care's externalizing behaviors, research has largely compared children in-care's outcomes in foster care with children in-care from kinship care (i.e., where a relative provides care). Compared to children living in foster-care placements, children from kinship homes have been found to show lower levels of externalizing behaviors (e.g., Holtan et al., 2005; Lawrence et al., 2006; Rosenthal & Curiel, 2006), although some inconsistencies have been noted (e.g., De Robertis & Litrownik, 2004). Fewer studies have compared children from regular foster care to those from group care settings. However, there is some preliminary evidence suggesting that the experience of group care is associated with more externalizing problems in children in-care. After accounting for selection bias through propensity score matching, youth who have experienced at least one group home placement were more likely to engage in delinquent behaviors (Ryan, Marshall, Herz, & Hernandez, 2008). However, it is unclear as to whether children in-care with more problematic behaviors are assigned to group care or foster care because they are unable to maintain a kinship placement or whether the experience of being placed in group care or foster care increases externalizing behaviors. Nevertheless, these observations suggest that type of care may be associated with externalizing behaviors.

1.3.2. Parental negativity

Children exposed to parental negativity, or parental behaviors that are affectively negative (Maccoby & Martin, 1983) are more likely to display higher levels of externalizing behaviors. This is consistent for children who live with biological parents (Chang, Schwartz, Dodge, & McBride-Chang, 2003) and those in foster care (e.g., Maikovich, Jaffee, Odgers, & Gallop, 2008). However, parental negativity can operate on children's externalizing behaviors in different ways. Exposure to parental negativity within the same family (i.e., children observing parental negativity that is directed toward siblings) can influence children's externalizing outcomes and relates to the emotional climate of the foster family. It accounts for why children from different families show different patterns of externalizing behaviors. Similarly, the amount of differential negativity a child experiences can also influence externalizing behaviors. This is a child-specific effect and highlights the extent to which a child's own experience with parental negativity is different from that of their siblings (one may refer to this concept as differential parenting). Differential parenting has been found to predict subsequent increases in children's behavior problems over time (McGuire, Dunn, & Plomin, 1995).

To date, family-wide processes have not been differentiated from processes that are specific to each child when examining associations between parental negativity and child externalizing outcomes in children receiving out-of-home care. However, drawing on research that involves children from the community, there is some evidence to suggest that both family-wide and child-specific effects of parental negativity are associated with child externalizing outcomes. The family average of parental negativity, and children's own exposure to parental negativity, have been found to predict differences in children's externalizing behaviors (Jenkins et al., 2009). Specifically, children from families with higher levels of parental negativity are more likely to show higher levels of externalizing behaviors. Similarly, children who have experienced relatively more differential negativity than their siblings are also more likely to show higher levels of externalizing problems. The present study examines whether associations between parental negativity and externalizing behaviors in children in-care were attributable to similar family- and child-specific processes.

1.4. Child-specific experiences

1.4.1. Placement satisfaction

Research examining the relationship between child placement satisfaction and outcome in children in-care is relatively sparse. However, existing research does suggest that children's perceptions of placement satisfaction change as a function of type of placement. For instance, children living in family-based foster care placements have been shown to report higher levels of placement satisfaction (Wilson & Conroy, 1999). Since children's satisfaction with their placement may be closely related to placement permanency, more placement satisfaction would suggest greater likelihood for placement permanency. To date, studies have demonstrated an association between externalizing behaviors and placement permanency where higher levels of externalizing behaviors are associated with a greater likelihood for placement disruptions (e.g., Hussey & Guo, 2005; see Oosterman et al., 2007 for a review). Given the robust finding that placement permanency is predictive of externalizing behaviors, it is likely that similar associations exist between placement satisfaction and externalizing behaviors.

1.4.2. Goals of the current study

In summary, the goals of the current study were two-fold: 1) examine the extent to which worker, foster family and child-level processes account for variance in children in-care's externalizing scores and 2) examine whether predictor variables at these different levels explain worker, foster family and child-level variance. We tested the following hypotheses: 1) there will be significant variance at the foster family and worker levels, with foster family variance accounting for a higher proportion of the variance than worker variance; 2) worker education will explain why children working with different workers show different patterns in externalizing behaviors; 3) foster family experiences relating to type of foster care placement will explain why children in-care from the same foster family are different; and 4) child-specific experiences relating to parental negativity and placement satisfaction will explain differences between children in-care from the same foster family.

2. Method

2.1. Participants and procedure

Assessment and Action Record (AAR) data from the Ontario Looking after Children (OnLAC) project were analyzed. The OnLAC project assesses the needs and developmental outcomes of children and youth in-care across Ontario. The AAR tracks and monitors the developmental trajectories of children and youth in-care across seven developmental domains; health, education, identity, family and social relationships, social presentation, emotional and behavioral development and self-care skills and transition to young adulthood (Flynn, Vincent, & Legault, 2009).

Society-specific data collected through the AAR are managed by individual Children's Aid Societies. Consent to use this data was obtained from each society. The recruitment of interested Children's Aid Societies was coordinated and facilitated through a child-welfare association that governed province-wide research in Ontario. A detailed description of the study was presented to the OnLAC steering committee and 50 Children Aid Societies were invited to participate. Of the societies who were contacted, 12 (24%) agreed to participate. These societies represent those from both urban ($n = 9$) and rural ($n = 3$) communities and generally represent the proportion of societies from urban and rural geographical locations across Ontario.

The AAR was completed by workers, as well as foster parents and children in-care. The AAR was administered verbally to foster parents and children in-care by workers over several sessions. Foster parents and children in-care were interviewed together and their responses were recorded by workers. Meanwhile, worker-specific questions were completed by workers privately or during foster parent/child in-care interview sessions.

The sample used in the current analysis included AAR data collected in 2007–2008 of children in-care ($n = 1,063$). Children in-care ranged between 10 and 17 years of age (M age $= 13$ years, 7 months), with slightly more boys ($n = 604, 57\%$) than girls ($n = 459, 43\%$). Children in-care under the age of 10 years were excluded from the current analysis as important child-reported measures were not collected for this age group. Children in-care spent between 0 years to 17 years under the care of the child-welfare system ($M_{time} = 7$ years) and their length of stay with their current in-care placement ranged between 0 years and 17 years ($M_{time} = 3$ years, 8 months). Most children in-care in the sample have experienced at least one form of abuse and/or maltreatment prior to coming into care. Specifically, 35% have experienced physical abuse, 13% have experienced sexual abuse, 62% have experienced neglect, and 42% have experienced emotional harm. Children in-care were primarily placed in foster care ($n = 865, 81\%$), with a small number of children placed in kinship care ($n = 91, 9\%$), or group care ($n = 107, 10\%$). Comparisons across groups suggested that all children in-care in the sample spent similar amounts of time in the child-welfare system, $F(2,1057) = 1.89$, $p = .15$. Similarly, there were no significant group differences in the amount of adversity (e.g., abuse, domestic violence) the children in-care experienced, $F(2,1060) = 2.57$, $p = .08$.

2.2. Deriving children's worker- and foster family membership

Worker and foster parent unique identifiers were not included in the dataset. Children in-care who were monitored by the same worker were identified by cross-referencing worker-specific variables. Thus, children in-care were identified as having the same workers if they were assigned to the same agency, their worker had the same initials and data matched on six key worker variables: education, length of time in child welfare, amount of training, field of education, amount of support from supervisor, and team membership. The same worker ID was assigned to children in-care who shared the same worker. There were 528 workers in the sample, 221 (42%) of whom worked with multiple children in-care in the agency.

Similarly children in-care living in the same foster family were identified by cross-referencing foster-parent specific variables. Children in-care were identified as foster siblings if foster parents had the same initials and matched on 27 key items such as gender, health, training, smoking and religiosity. The same foster family ID was assigned to children in-care from the same foster family. In total, there were 962 foster families in the sample. The majority of foster families cared for one child in-care ($n = 820, 85\%$) with a small number of foster families fostering multiple children in-care ($n = 142, 15\%$).

2.3. Measures

Different informants such as mothers, fathers and teachers have been found to provide different assessments regarding children's behaviors (Achenbach, McConaughy, & Howell, 1987). Therefore, the inclusion of multiple informants in assessing children's outcomes can increase accuracy in measurement. A diversity of perspectives is especially helpful when informants can provide information based on the context in which they interact with the child. When possible, composite measures that combine reports across multiple informants were used in the current analysis. Specifically, worker, foster parent, and when available, children in-care reports were used (refer to Table 1 for a summary of study variables).

2.3.1. Children in-care's externalizing behaviors

A multi-informant measure of children in-care's externalizing behaviors was created. To assess whether general behavioral and

Table 1
Summary statistics table of the study's variables.

Variable	Mean score	Standard deviation	Range
Children's externalizing behaviors	0.00	1	−1.60–4.13
Emotional and behavioral problems − worker report	2.22	.92	1–4
Strengths and difficulties questionnaire − foster parent report	1.49	.47	1–3
Frequency of externalizing behaviors − child or foster parent report	1.25	.35	1–3
Child age	13.57 years	2.08 years	10–17 years
Parental negativity	.001	.82	−1.10–2.98
Conflict resolution − foster parent	1.36	.33	1–2.83
Ineffective/hostile parenting–child	1.45	.41	1–3
Family average of parental negativity	.00	1	−4.45–3.91
Deviation score of parental negativity	.00	1	−6.35–4.91
Placement satisfaction	.00	1	−3.52–.62
Worker education	.00	1	−3.48–2.21

emotional objectives of the child-welfare system were met, workers were asked to report the extent to which the child in-care was free of serious emotional and/or behavioral problems on the AAR. Possible responses ranged from 1 (no problems) to 4 (serious problems exist which need specialized assistance). Although workers were not explicitly asked to assess children in-care's externalizing behaviors, higher scores reflected more difficulties. This question in the AAR was completed for all children in-care.

Foster parents' perception of children in-care's externalizing behaviors was assessed with five items from the conduct subscale of the Strengths and Difficulties Questionnaire (SDQ; Goodman, Ford, Simmons, Gatward, & Meltzer, 2000). An example of the types of items that were included is: 'often fights with other children or bullies them' or 'often loses temper'. Possible responses ranged from 1 (not true) to 3 (true). Positive items were reverse coded so that higher scores reflected more difficulties. All items showed acceptable internal consistency, $\alpha = .72$, with the exception of one item ('generally well behaved, does what adults request'), and was subsequently removed. A mean score based on the remaining four items was created for all children in-care.

Items assessing the frequency of externalizing behaviors were asked of children in-care between 10 and 15 years of age. For children in-care between 10 and 11 years of age, the items were completed by foster parents. However, children in-care between the ages of 12– 15 years reported on these items themselves. Children in-care between 16 and 17 years of age did not have these measures completed about them. Foster parents/children in-care were asked to report the frequency of physical aggression (e.g., I physically attack people) and committed property offenses (e.g., I steal at home). These measures are drawn from existing instruments that demonstrate acceptable levels of reliability and validity and have been widely used in epidemiological studies in Canada (refer to Statistics Canada & Human Resources Development Canada, 1999 for a more detailed description of measures). Foster parents/children in-care responded to six items on a 3-point scale that ranged from 1 (never or not true) to 3 (often or very true). Higher scores reflected more externalizing behaviors. Foster-parent reports showed high internal consistency, $\alpha = .83$, and for children in-care between 10 and 11 years of age, a foster-parent mean score was created based on the six items. Children in-care who reported on these items also achieved acceptable internal consistency, $\alpha = .73$. A mean score was created for children in-care between 12 and 15 years of age.

Multi-informant measures of children in-care's externalizing behaviors were constructed based on foster parent, worker and when available, children in-care reports. First, all informant reports were standardized and turned into z scores. Correlations between informant ratings ranged from $r = .38$, $p < .05$ to $r = .55$, $p < .05$ depending on the informant pair and the child's age. A composite score of children in-care's externalizing behaviors was then created by taking the mean score across worker, foster parent, and when

available, child in-care reports (i.e., children in-care between 12 and 15 years of age). Considering that not all children in-care supplied reports on their externalizing behavior, we examined whether removing child reports from the externalizing composite altered results. Since results remained unchanged after removing child reports, children in-care's ratings were included in mean scores when available. As such, the number of respondents reporting on children's externalizing behaviors varied across age groups, with children between 12 and 15 years providing self reports. Children in-care's externalizing scores where standardized and ranged between −1.60 and 4.13.

2.3.2. Child age and gender

Children in-care's ages and genders were obtained from child records. Each child in-care's age (standardized) was coded in years, with boys coded as 0 (reference category) and girls coded as 1.

2.3.3. Type of foster care placement

Child-welfare workers were asked to indicate whether children in-care were placed in foster (reference category), kinship, or group care. Binary indictor variables were then created for each care category so that 'no' was coded as 0 (reference category) and 'yes' was coded as 1.

2.3.4. Parental negativity

Parental negativity was operationalized as the combined score (taking the mean) of foster parents' report of conflict resolution and children in-care's report of ineffective/hostile parenting. Both foster parent and child in-care measures show well established reliability and validity and are drawn from existing parenting instruments that have been widely used in epidemiological studies in Canada (refer to Statistics Canada & Human Resources Development Canada, 1999 for a more detailed description of measures).

Foster parents responded to eight items that were designed to assess how often they disagreed with the child in-care (e.g., we disagree and have arguments) or used negative conflict resolution strategies (e.g., when we disagree, I refuse to talk to him/her). Possible responses ranged from 3 (pretty often or almost all the time) to 1 (a little or not at all). Each positive item was reverse coded so that higher scores reflected more negativity between foster parent-child in-care dyads. All items, with the exception of two (i.e., 'We make up easily when we have a fight' and 'When we disagree about something we solve the problems together') showed acceptable internal consistency, $\alpha = .69$ and a mean score was created based on the remaining 6 items.

Similarly, children in-care were asked to report the extent to which they experienced ineffective/hostile parenting from foster parents. Children in-care were asked to respond to five items that assessed the frequency of parental negativity (e.g., my foster parent gets angry and yells at me) and inconsistent parenting (e.g., my foster

parent enforces a rule or does not enforce a rule depending on their mood). Possible responses ranged from 3 (often or always) to 1 (rarely or never) with higher scores reflecting more ineffective parenting. All items showed acceptable internal consistency, $\alpha = .66$ and a mean score was created based on the five items.

Mean scores across foster parent and child in-care reports were standardized. Standardized scores were significantly correlated, $r = .29$, $p < .05$ and a mean score, based on these standardized measures were created for each child in-care. A family average of parental negativity was created for each foster family. For multiple children in-care from the same foster family, a family mean was taken across all foster siblings (i.e., all children were given the same score). For singletons, the family average was equivalent to the child in-care's raw score. The child in-care's deviation from the family mean was also calculated, but was only relevant for a follow-up analysis completed for multiple-child households. Positive scores represented less exposure to parental negativity relative to foster siblings whereas a negative score indicated more exposure. Family average and deviation scores were standardized. Family average scores and deviation scores ranged between −4.45 to 3.91 and −6.35 to 4.91, respectively.

2.3.5. Placement satisfaction

Children in-care's placement satisfaction was assessed using the Placement Satisfaction scale which has been demonstrated as reliable and valid by previous research (Flynn, Robitaille, & Ghazal, 2006). Children in-care were asked to report their satisfaction with their current care placement. The Placement Satisfaction scale consisted of six items rated on a 3-point scale ranging from 1 (very little) to 3 (a great deal). Examples of items include: 'would you say that you like living here' or 'would you say that you feel safe living in this home'. The scale showed high internal consistency, $\alpha = .90$. A mean score was created and standardized, ranging between −3.52 and .62. Higher scores indicated higher satisfaction with the current in-care placement.

2.3.6. Worker education

Workers were asked to indicate their highest level of education. There were nine possible responses ranging from "less than a high school diploma" to "doctoral degree". Nine ordered categorical variable were created with integer values ranging from 1 "less than a high school diploma" to 9 "doctoral degree" with higher scores reflecting higher formal educational attainment. Scores were standardized and ranged between −3.48 and 2.21.

2.4. Missing data

Of the 1063 participants who were included in the sample, 72 participants had missing data. Little's MCAR test revealed that data were not missing completely at random, $\chi^2(32) = 61.22$, $p < .05$. An analysis of the pattern of missing data revealed that only the quality of placement had a substantial amount of missing data (>5%). Specifically, children with lower externalizing scores were more likely to have missing information concerning the quality of placement, $t(43) = -2.6$, $p < .05$. Moreover, children in group care were less likely to report on the quality of their foster care placement, $\chi^2(1) = 9.89$, $p < .05$. The pattern of missing data was not associated with other worker, foster family and child-specific factors.

Given this pattern of missing data, missingness was addressed through the now standard method of random multiple imputation introduced by Rubin (1987). Multiple imputations involve generating multiple data sets where the missing values in each data set are replaced with 'plausible' values derived from observed data. The cross-classified multilevel model is then fitted to each complete data set in the usual way. The multiple sets of model results are then combined using rules developed by Rubin to produce estimates and standard errors that, unlike single imputation, reflect the uncertainty in the imputation process. Graham (2009), Rubin (1996), Schafer (1999) and Sinharay, Stern, and Russell (2001) specifically review the method of multiple imputation.

SPSS 17 was used to carry out the multiple imputation procedure. Child-level variables were imputed by including child in-care, worker and foster family variables in the imputation model. Foster-family level variables were imputed by including foster-family level variables as well as the foster family average for child-specific variables (e.g. children in-care's externalizing) and the foster family average for worker-specific variables (e.g. worker education). Worker-level variables were imputed by including worker-level variables as well as the worker average for child-specific variables and the worker average for foster family specific variables. Results for all fixed effects were essentially the same for pre and post imputation.

2.5. Analysis description and plan

Cross-classified multilevel models were used to account for the cross-classification of workers and foster families (within the same foster family, different workers could be working with different children in-care and similarly the same worker may work with children in-care from different foster families, Browne, Goldstein, & Rasbash, 2001; Rasbash & Browne, 2001, 2008). These models allowed us to partition variation in children in-care's externalizing behavior scores into three distinct variance components: the between-worker variance, the between foster-family variance and the child-specific variance. The between-worker variance measures the extent to which children in-care's scores vary across workers, the between foster-family variance measures the extent to which children in-care's scores vary between foster families while the child-specific variance measures the residual variation between children in-care. The simultaneous estimation of these three variance components ensures the correct attribution of variation to each level. Note, however, that the separate identification of the foster family and child in-care variance components is based only on foster families with two or more children in-care. Foster families caring for one child in-care in the sample were retained as their data contributes to the identification of other model parameters. Respectively, higher values for each variance indicated greater differences between workers, foster families and children in-care.

Two useful statistics when interpreting the magnitude of the worker, foster family and child in-care variance components are the variance partitioning coefficient (VPC, Goldstein, Browne, & Rasbash, 2002) and the intraclass correlation coefficient (ICC). The VPC communicates the relative importance of a given level as a source of variation and is calculated as the variance at that level divided by the total variance. For example, the foster-family level VPC is calculated by dividing the foster-family level variance by the total variance. The higher the value of the foster-family level VPC, the more important foster families are as a source of difference in children in-care's externalizing behaviors. For the models presented in the current analysis, the ICC for a given level is calculated in the same way as the VPC. The ICC, however, offers an alternative interpretation. For example, the foster-family level ICC is interpreted as the correlation in externalizing scores between two children in-care from the same foster family, assigned to different workers. Therefore, higher values indicate greater degrees of similarity between the externalizing behaviors of foster siblings.

The association between worker, foster family and child-specific predictors and children in-care's externalizing scores are assessed with increasingly complex model specifications. Model 1, often referred to as a "null model", is the simplest model and included no predictors. The null model allowed us to calculate the worker, foster family and child-level VPCs to establish the relative importance of these three levels for explaining variation in children in-care's

externalizing scores. Model 2 included child age and gender covariates as standard control variables, while worker education was added into Model 3 to examine the extent to which between-worker differences in children in-care's externalizing behaviors were attributable to worker training. Model 4 additionally included the family-level covariates kinship and group care to examine whether types of foster care placement explained between foster family differences in children in-care's externalizing behaviors. Foster care was the reference group. The final model, Model 5, additionally examined the association between children in-care's externalizing behaviors and the emotional climate of the foster family. To differentiate between the effects of children's exposure to parental negativity from negativity that is directed towards them, the family mean of parental negativity and children's deviation from the family mean are both included in the final model. The family mean operationalized the absolute level of parental negativity and the deviation from the family mean refers to comparative processes: the difference in the child in-care's experience from other children in-care from the same household. For singleton foster families, the second variable does not vary and therefore, the effect of differential parental negativity is identified solely from foster families with multiple children. Lastly, the child-level correlate placement satisfaction was entered into the model to assess its association with children in-care's externalizing outcomes.

All five cross-classified multilevel models were estimated with Markov Chain Monte Carlo (MCMC) procedures as implemented in the MLwiN 2.23 statistical software package (Rasbash et al., 1999). We ran MLwiN through the Stata statistical software package by using the user written runmlwin Stata command (Leckie & Charlton, 2011). Each model was run for a burn-in of 5000 iterations followed by a monitoring chain of 50,000 iterations (see Browne, 2009, for full details regarding the implementation of MCMC procedures in MLwiN). Parameters significant at p<.05 were marked with an asterisk in Table 2.

3. Results

Model 1, the null model, partitioned the variation in children in-care's externalizing behavior into worker, foster family and child in-care components of variation (refer to Table 2). The worker VPC was .097 (=.097/(.097 + .185 + .724)), which suggested that 9.7% of the

variation in children in-care's scores was attributable to differences between workers. When interpreted as an ICC, this value indicated that the correlation between children in-care from different foster families working with the same worker is, on average, just .097. Workers therefore contributed a relatively small source of variation in children in-care's scores. Therefore, only a small degree of similarity in externalizing behaviors between children in-care working with the same worker was found.

The foster family VPC was .185, which suggested that 18.5% of the variation in children in-care's scores was attributable to differences between foster families. When interpreted as an ICC, .185 indicated that the correlation between children in-care from the same foster family, who have different workers was, on average, .185. Foster families therefore appeared to be a relatively larger source of variation in children in-care's scores than workers. This suggested that there is a larger degree of similarity in externalizing behaviors between foster siblings within the same foster family than between children in-care working with the same worker.

The child VPC was .724, which suggested that 72.4% of the variance in children in-care's externalizing behaviors can be explained by unique characteristics and experiences of children. Taken together, the results demonstrated that although differences in externalizing behaviors are primarily attributable to child-specific effects, there is a degree of clustering (i.e., an ICC of 0.282 for the correlation between two children from the same worker and the same family) that occurred as a function of both worker and foster family effects.

In Model 2, the control variables child age and gender were entered into the model as covariates. Results suggested that younger, relative to older children, displayed higher levels of externalizing behaviors. For every year of age, there was a .10 standard deviation decrease in children in-care's externalizing behaviors. Boys, relative to girls showed higher levels of externalizing behaviors. The inclusion of child age and gender into the model explained 26% (0.097 – 0.072/0.097) of the variance at the worker level. The foster family variance goes up slightly when child age and gender are entered into the model. (The increase in the family variance reflects differences in the within-family and between-family effects of age and gender on externalizing behavior, Raudenbush & Bryk, 2002; Snijders & Bosker, 1999, but as this is not the substantive focus of the present paper we do not explore it further). The apparent importance of workers as a source of variation in children in-care's externalizing behaviors

Table 2
Parameter estimates from a series of cross-classified multilevel models of children's externalizing behaviors (N = 1,063).

	Model 1	Model 2	Model 3	Model 4	Model 5
Fixed part parameters					
Intercept	0.022 (.031)	0.095 (0.045)[*]	0.090 (0.043)[*]	0.045 (0.046)	0.051 (0.046)
Worker level					
Worker education			−0.133 (0.037)[*]	−0.086 (0.040)[*]	−0.082 (0.038)[*]
Foster family level					
Kinship care (ref. regular foster care)				−0.290 (0.117)[*]	−0.338 (0.109)[*]
Group care (ref. regular foster care)				0.541 (0.121)[*]	0.361 (0.124)[*]
Parental negativity: family average					0.253 (0.033)[*]
Child level					
Child age		−0.103 (0.012)[*]	−0.136 (0.059)[*]	−0.128 (0.032)[*]	−0.138 (0.030)[*]
Child gender (ref. boy)		−0.176 (0.066)[*]	−0.172 (0.065)[*]	−0.142 (0.064)[*]	−0.106 (0.062)
Parental negativity: deviation score					−0.103 (0.041)[*]
Placement satisfaction					−0.139 (0.040)[*]
Random part parameters					
Worker level variance	0.097 (0.033)[*]	0.072 (0.036)[*]	0.055 (0.038)	0.063 (0.034)	0.051 (0.029)
Foster-family level variance	0.185 (0.076)[*]	0.201 (0.084)[*]	0.177 (0.070)[*]	0.132 (0.066)[*]	0.134 (0.059)[*]
Child level variance	0.724 (0.080)[*]	0.723 (0.081)[*]	0.736 (0.078)[*]	0.742 (0.077)[*]	0.649 (0.069)[*]

Values presented in parentheses represent the standard error.
[*] Coefficients significant at p<.05.

decreased (VPC = .072) after accounting for child age and gender. This suggested that the age and gender profile of children varies across workers, with some workers who were more likely to work with a certain age group or gender.

In Models 3, 4 and 5, the variables of interest were entered as covariates to explain between-worker and between-family variances. In Model 3, worker education was entered as a worker-specific predictor to explain between-worker variance. Worker education was significantly associated with children in-care's externalizing behaviors. Specifically, workers with less education were more likely to work with more difficult children. The addition of this variable explained approximately 24% of the variance at the worker level (=(0.072 – 0.055)/0.072), although this represents an upper bound estimate as not all child- and family-level fixed effects are yet in the equation. Significant worker level variance as seen in Model 1 was no longer significant in Model 3.

Given the cross-classified nature of our model, if certain workers were more likely to work with certain types of foster families, the inclusion of worker-level predictor variables would also account for variance at the foster-family level. Indeed, the inclusion of worker education into the model was found to account for approximately 12% of the variance at the foster-family level (=(0.201 – 0.177)/0.201). This suggested that depending on worker education, some workers may be more likely to work with certain families.

To examine whether type of care predicted children in-care's externalizing behavior, binary indicators of kinship care and group care were entered into Model 4, with foster care as the reference category. Relative to those in foster care, children in kinship care displayed lower levels of externalizing behaviors. However, children placed in group care displayed higher levels of externalizing behaviors. The addition of these variables into the equation explained approximately 25% of the variance at the foster-family level (=(0.177 – 0.132)/0.177). The worker and child variances go up slightly when type of care is entered into the equation, for the reasons described above.

In Model 5, we examined the effects of the emotional climate of the foster family on children's externalizing behaviors. Specifically, we examined the effects of parental negativity and placement satisfaction. To examine the effects of parental negativity, the family average of parental negativity and children in-care's deviation score were entered into the model. Results showed that both the family average of parental negativity and deviation scores were significantly associated with children in-care's externalizing behaviors. Specifically, foster families who displayed higher levels of parental negativity were more likely to foster children with higher externalizing scores. However, having accounted for the family average of parental negativity, children in-care exposed to more parental negativity relative to their foster siblings displayed higher levels of externalizing behaviors. Lastly, children in-care who were less satisfied with their current placement were more likely to show higher levels of externalizing behaviors. The inclusion of these variables into the model accounted for approximately 12% of the child-level variance, (=(0.742 – 0.649)/0.742). Worker-level variance also dropped 19% (=(0.063 – 0.051)/0.063), again suggesting that certain types of workers are more likely to work with certain types of family.

4. Discussion

The current study examined the simultaneous levels of influence of workers and foster families on children's externalizing behaviors in those who are receiving out-of-home care. Our first goal was to examine whether children in-care's externalizing behaviors were attributable to worker and foster-family effects. Current findings suggest that although differences are primarily attributable to child-specific processes, both the worker variance (accounting for 9.7% of the variation) and family variance (accounting for 18.5% of the variation) are also significant. These results align with existing research that has demonstrated the relative importance of the family on child externalizing outcomes (e.g., Jenkins et al., 2005). In comparison to foster families, differences between workers explained less variance on children in-care's externalizing behaviors (i.e., workers have a smaller variance partitioning coefficient). This converges with the assumption that families have a stronger influence on development than more distal factors such as communities, schools and in the case of children in-care, child-welfare workers (Bronfenbrenner, 1979).

In sum, current findings highlight the importance of contextual factors in understanding the development of externalizing behaviors in children in-care. Previous studies have found that differences between agencies explained approximately 12% of the variance in children's externalizing behaviors (e.g., Attar-Schwartz, 2008). However, current results suggest that contextual factors may have a larger effect on externalizing behaviors in children in-care than have previously been reported. Combined, worker and foster-family level of effect account for approximately 28% of the variance in children in-care's externalizing outcomes. Although methodological differences may account for discrepancies across studies, possible agency effects may have been interpreted as part of the worker effect since agency-level effects were not considered in the current analysis. Nevertheless, these studies highlight the importance of modeling agency, worker, foster family and child-specific levels of influence simultaneously to accurately estimate the combined effects of these different levels of influence.

Our second goal was to determine whether predictor variables, at these different levels explained worker, family and child-level variance. Three findings emerge that are worthy of comment. First, worker education and type of foster care placement appear to predict children's externalizing behaviors. Second, children's externalizing behaviors are associated with the family average of parental negativity as well as differential experiences within foster families. Third, variance in children's externalizing behavior is related to placement satisfaction. In the following sections, each of these findings is discussed.

4.1. Worker education, type of placement and children's externalizing behaviors

4.1.1. Worker education

Current findings suggest that workers with less formal education are more likely to work with more difficult children. Specifically, worker education accounted for 24% of the variance seen at the worker level. These observations support our original hypothesis that worker education will explain between-worker variance in children in-care's externalizing behaviors. To our knowledge, this is the first time these results have been demonstrated. However, given the cross-sectional nature of the current study, it is impossible to distinguish between selection effects (workers with less education are assigned to work with more difficult children) from causal influences (workers influence the outcomes of children in their care). In either case, current results suggest that workers with less formal education are working with more challenging children.

The selection explanation suggests that societies that work with difficult children may have trouble hiring or attracting well-qualified staff. In the current study we did not have enough agencies to examine an agency effect. To date, the simultaneous influence of worker- and agency-level effects on externalizing behaviors has not been examined. As agency effects have been identified (e.g., Attar-Schwartz, 2008; Rosenthal & Curiel, 2006) it would be valuable to tease apart worker and agency influences. Another possible 'selection' dynamic is that workers with more formal education are more resourceful at advocating for case assignment that involves less difficult children.

The causal explanation suggests that workers may vary in their efficacy of dealing with vulnerable children. One possibility is that more educated workers are more resourceful at working at the interface between children and placements such that the placement runs more smoothly. An alternative explanation is that more qualified workers are better at choosing care settings that serve children's needs. There is evidence to suggest that child-welfare professionals vary substantially on the weighting that they give different case characteristics when deciding to remove a child from their home (Britner & Mossler, 2002). Thus it is possible that decision making about children is influenced by worker education. Workers with more formal education may also be better at arranging and maintaining placements (including kinship placements) that are more effective at meeting the needs of children in-care. This may involve advocating for supports within the agency (e.g., supervision from supervisors) and community (e.g., community-based supports) so that the provision of care for children in-care involves multiple stakeholders. To date, greater levels of informal supports have been shown to be associated with positive parenting outcomes (Lyons, Henly, & Schuerman, 2005).

Although we were unable to distinguish between selection effects and causal influences, the current results provide some anecdotal evidence to support a possible selection effect. Although highly speculative, given that the significant worker-level variance becomes non-significant once worker education is included, suggests that after accounting for differences in educational attainment, workers may be equally effective. Differences seen between workers in Model 3 could be more reflective of the non-random assignment of children to workers than about differences in worker's abilities.

It is also important to consider other factors such as years of experience in the child-welfare sector that could explain possible worker effects. For instance, as more experienced workers become more adept at navigating the child-welfare system, the length of time working in the child-welfare sector rather than worker education may be more predictive of the worker effect. Clearly the current study is unable to address this possibility and longitudinal data is required to distinguish between possible selection and causal effects as well as the influence of worker education and length of time working in the child-welfare sector.

4.1.2. Type of foster care placement

In support of our original hypothesis, type of foster care placement appears to be associated with children's externalizing behaviors and explains variance between foster families. Specifically, the inclusion of these variables into the model accounts for approximately 25% of the variance at the foster-family level. Children placed in kinship care show lower levels of externalizing behavior in comparison to non-kinship foster care, while children placed in group care show higher levels.

These findings replicate results from other studies that have demonstrated better externalizing outcomes in children who are placed in kinship homes relative to those in foster care (e.g., Rosenthal & Curiel, 2006). However, it is important to note that the literature remains largely inconclusive as better externalizing outcomes are not always reported for children in kinship placements (see Cuddeback, 2004 for a review) and at times, associated with more negative outcomes in children (e.g., Taussig & Clyman, 2011). There are two possible explanations for the current finding that children in kinship placements have lower levels of externalizing behaviors: 1) children with lower levels of externalizing behaviors may be more likely to be placed in kinship placements rather than foster care; or 2) kinship placements result in lower levels of externalizing behaviors. Though not measured, perhaps the general quality of kinship placements in our sample was higher when compared to foster care placements. This possible explanation would support Shlonsky and Berrick (2001)

emphasis on the quality of out-of-home care (e.g., safer placements, better neighborhoods) for better child outcomes.

There is also some evidence to suggest that children in group care display higher levels of externalizing behaviors when compared to those placed in foster care, replicating findings from multiple studies in the child-welfare literature (e.g., Ryan et al., 2008). It is likely that the high level of externalizing behavior shown by children in group homes is in part a selection effect (more externalizing children get placed in group homes because they can not be tolerated in other settings). It is likely however that a causal influence may also be involved: exposure to delinquent peers increases the children's own externalizing behavior. Externalizing behaviors have been found to increase as a function of children's exposure to externalizing peers (Dishion, McCord, & Poulin, 1999). Delinquent peers train their friends on similar behaviors. The effects of exposure to deviant peers have been shown for delinquency (one type of externalizing behavior), alcohol and drug abuse (e.g., Barnes, Hoffman, Welte, Farrell, & Ditcheff, 2006), risky sexual behavior (e.g., Metzler, Noell, Biglan, Ary, & Smolkowski, 1994; Whitebeck, Yoder, Hoyt, & Conger, 1999) and other risk-taking behaviors (e.g., Jaccard, Blanton, & Dodge, 2005).

Evidently, longitudinal research that considers the bi-directional influence of children's own externalizing behaviors and worker education and type of placement is required to examine these issues more closely. Despite the ambiguity in direction of effects, current results highlight the importance of considering worker and placement effects when understanding externalizing behaviors in children.

4.2. Parental negativity

We distinguished between family average and differential parental negativity experienced by children. In support of our original hypothesis, results suggest that both family average and differential parental negativity in foster families with multiple children, explain variance in children's externalizing behavior.

Associations between parental negativity and externalizing behavior in children are well recognized. Such effects, examined longitudinally, appear to be bi-directional (Yaghoubzadeh, Jenkins, & Pepler, 2010) with aggressive children eliciting more hostile parenting and hostile parenting resulting in increased child aggression. The finding that differential parental negativity predicts externalizing behaviors in children in-care, over and above that of parental negativity within the same foster family, is novel. Although such associations have been demonstrated in families who are not involved in the foster-care system (e.g., Jenkins et al., 2009; Meunier, Jenkins, & Bisceglia, 2011; Shanahan, McHale, Crouter, & Osgood, 2008), the current study is the first one to differentiate between absolute and differential processes in foster families. Over and above the importance of absolute level of parental negativity is the experience of being disfavoured by foster parents when compared to foster siblings.

For children who live with their biological families, such disfavouring predicts an increase in children's aggression over time (McGuire et al., 1995). The pathogenic element of disfavouring treatment is the child's attribution of unfairness. However, differential treatment that is understood by the child as justified has been found to be associated with less negative consequences (Kowal & Kramer, 1997). As children and parents often hold different perceptions of parental behaviors, increased communication about differential treatment is important in clarifying children's possible misconceptions about parents' actions (Kowal, Krull, & Kramer, 2006). Perhaps foster parents can mitigate the negative effects of differential treatment by engaging in more explicit family discussions of the reasons for parental behaviors.

4.3. Satisfaction with placement

A significant association between placement satisfaction and children's externalizing behaviors is found. In support of our original hypothesis, children who report less placement satisfaction are more likely to display higher levels of externalizing behaviors.

Placement satisfaction refers to children's feelings of comfort and safety in their homes. Attachment (e.g., Fearon, Bakermans-Kranenburg, van Ijzendoorn, Lapsley, & Roisman, 2010; Guttmann-Steinmez & Crowell, 2006) and marital conflict researchers (e.g., Kaczynski, Lindahl, Malik, & Laurenceau, 2006) have demonstrated the importance of children feeling secure in their family environments for their long term well-being. This study extends the construct of security to children receiving out-of-home care.

4.4. Limitations and directions for future research

There are several caveats to be considered when interpreting findings. First, given the cross-sectional nature of the study, associations are correlational and do not speak to the causal relationship between variables. Future research initiatives can include adapting a longitudinal framework to examine the causal relationships between factors. It is also possible with multilevel modeling to examine the interactions between variables, especially across different levels (i.e., cross-level interactions). Although this was not examined in the current study, future research may consider how worker-, foster family and child-specific predictors operate together. Second, despite the inclusion of multi-informant data, there is some degree of confound between informants' reports. As both foster parents and children supplied workers with information to complete the Assessment and Action Record (AAR) our agreement across informants is higher than usually found in community samples (e.g., Salbach-Andrae, Lenz, & Lehmkuhl, 2009). Although worker ratings are always heavily influenced by parent and child report, given that workers have limited direct experience of children, collecting separate parent and child data strengthened our interpretation of results. Inclusion of assessments from multiple respondents can reduce respondent bias, particularly for constructs such as parental negativity where ratings can be more subjective. However, given that the AAR is used as both a clinical and research tool, collecting data from children in-care was not always possible. A consequence of this includes inconsistency of the number of respondents reporting on externalizing behaviors (i.e., children between 12 and 15 years of age had three respondents while those between 10 and 11 years of age had two). Perhaps future research can adopt the AAR as a research tool and a more rigorous research methodology can be used. Third, we did not have data on the genetic relatedness of children who had biological siblings living in the same foster family. Given that placing siblings together in foster care may be protective against maladaptive outcomes (e.g., Linares, Li, Shrout, Brody, & Pettit, 2005), it is likely that some of our multi-children foster families had children that are genetically related to one another. Genetic influence on behavior would be evident in the family component of variance if a genetic model was not fitted. Consequently, although we interpreted the family effect as an environmental influence, it may also represent some genetic influence. Lastly, given the low participation rate from agencies, it is possible that only certain agencies were likely to participate. More importantly, this precluded us from examining agency-level influences. However, possible agency effects may have been interpreted as part of the worker's variance-partitioning coefficient. Since significant agency-level variance has been found (e.g., Attar-Schwartz, 2008) simultaneously examining agency, worker, family and child effects will be a critical next step for future research.

4.5. Implications for practice

The evidence for worker- and family-level influences may have important implications for practice and policy development. Although it is not possible to determine the direction of effects because of the cross-sectional nature of the data, current results do provide some preliminary support for the effectiveness of interventions and policies that target workers and foster families. Although child-specific effects remain the largest, current findings suggest that interventions and policies that target worker and foster family-wide processes may have a noticeable impact on externalizing outcomes since approximately 28% of the variance in problematic behaviors can be attributable to these level of influences. Current findings advocate for the inclusion of the worker, foster family and child in future intervention and policy initiatives.

Results from the current analysis have identified two possible family-level processes that may improve children's externalizing outcomes: parental negativity and placement satisfaction. Perhaps interventions aimed at reducing parental negativity (within the foster family and differential parental negativity) and improving placement satisfaction may contribute to better externalizing outcomes in children in-care. Parenting initiatives that help foster parents develop more sensitivity to the needs of their children can subsequently result in more positive interactions, mitigating the effects of parental negativity. Moreover, helping foster parents develop strategies to engage in more open discussions for differential parental behaviors may also help lessen the negative effects of differential parenting. Lastly, efforts to promote placement satisfaction by improving safety and physical living conditions may help improve children's externalizing outcomes. Future research will be required to substantiate these possibilities.

In sum, cross-classified multilevel modeling is an innovative technique that can help us understand the influence of different contextual factors on children's externalizing behaviors. Current findings highlight the importance of worker and family effects when understanding externalizing behaviors in children in-care. Not only do differences between workers and foster families account for differences in children's externalizing patterns, but these differences can be explained by worker-level processes such as worker education and family-level processes such as placement type, and parental negativity.

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