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# Placement decisions and disparities among aboriginal groups: An application of the decision making ecology through multi-level analysis

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ABSTRACT

**Objective:** This paper examined the relative influence of clinical and organizational characteristics on the decision to place a child in out-of-home care at the conclusion of a child maltreatment investigation. It tested the hypothesis that extraneous factors, specifically, organizational characteristics, impact the decision to place a child in out-of-home care. A secondary aim was to identify possible decision making influences related to disparities in placement decisions tied to Aboriginal children. Research suggests that the Aboriginal status of the child and structural risk factors affecting the family, such as poverty and poor housing, substantially account for this overrepresentation.

**Methods:** The decision to place a child in out-of-home care was examined using data from the *Canadian Incidence Study of Reported Child Abuse and Neglect*. This child welfare dataset collected information about the results of nearly 5,000 child maltreatment investigations as well as a description of the characteristics of the workers and organization responsible for conducting those investigations. Multi-level statistical models were developed using MPlus software, which can accommodate dichotomous outcome variables, which are more reflective of decision making in child welfare. Mplus allows the specific case of the logistic link function for binary outcome variables under maximum likelihood estimation.

**Results:** Final models revealed the importance of the number of Aboriginal reports to an organization as a key second level predictor of the placement decision. It is the only second level factor that remains in the final model. This finding was very stable when tested over several different levels of proportionate caseload representation ranging from greater than 50% to 20% of the caseload.

**Conclusions:** Disparities among Aboriginal children in child welfare decision making were identified at the agency level.

**Practice implications:** The study provides additional evidence supporting the possibility that one source of overrepresentation of Aboriginal children in the Canadian foster care system is a lack of appropriate resources at the agency or community level.



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## Introduction

Among indigenous populations, disparities in child welfare placement decisions have been documented in Canada (Auditor General of Canada, 2008; Trocmé et al., 2001, 2005); in the United States (Hill, 2007; United States Department of Health and Social Services, 2006), and in Australia (Australian Institute for Health and Welfare, 2008). While this paper is based on Canadian data, the results may have implications for other countries with indigenous populations. For the purposes of this paper, the term Aboriginal will be used to describe diverse First Nations, Metis and Inuit peoples in Canada and the term Native American is used to describe the diverse Native American/Alaskan Native peoples in the USA. Research suggests that the Aboriginal status of the child and structural risk factors affecting the family, such as poverty and poor housing, substantially account for this overrepresentation (Trocmé, Knoke, & Blackstock, 2004). However, little attention has been paid to the effects of child welfare agency characteristics on child welfare case decisions involving Aboriginal children. Using data collected in the 1998 cycle of the Canadian Incidence Study on Reported Child Abuse and Neglect (CIS-98), this study examines the effects of child welfare agency characteristics on the decision to place Aboriginal and non-Aboriginal children who were reported to child welfare authorities in out-of-home care. The paper builds on the work of Fallon (2005), who examined the contribution of organizational factors to short-term service dispositions using data from the CIS-1998, consistently finding the Aboriginal status influenced service decisions.

Decision making under uncertainty (Swets, 1992) is a well-known feature of child welfare , including decisions to place children outside of their homes. Such decisions, while heavily influenced by case characteristics, are also known to be a function of decision-maker thresholds for action (e.g., out of placement) which in and of themselves may be set independently of knowledge about the case (Dalgleish, 1988). Factors that influence action thresholds can be described as part of the Decision Making Ecology (DME) which includes characteristics of the case worker, the agency, as well as other external factors (Baumann, Kern, & Fluke, 1997). As shown in Fig. 1, these factors can be conceptualized in a multi-level model. Thus, from the DME disparities such as those found by race in placement decisions may result from interactions with non-case related components such as worker or agency characteristics. These non-case related components are reflected in the form of individual or group thresholds for taking action. If disparities persist when controlling for other factors such as poverty, it may be possible to isolate sources or levels within the DME that are associated with disparities in placement decision making.

## Literature review

### *Overrepresentation of Aboriginal children in Canadian child welfare*

The chronic overrepresentation of Aboriginal children in Canadian child welfare care has been well documented (Blackstock, Prakash, Loxley, & Wien, 2005; McKenzie, 1997; Royal Commission on Aboriginal Peoples, 1996). Analysis based on national census data noted that while 5% of children in Canada were Aboriginal in 1998, Aboriginal children made up 17% of children reported to the child welfare, 22% of substantiated reports of child maltreatment, and 25% of children placed in care in Canada (Blackstock, Trocmé & Bennett, 2004). The disproportionate number of Aboriginal children in care relative to the Aboriginal child population is a major concern throughout Canada but is most pronounced in the western provinces which have significant populations of Aboriginal peoples (Foster, 2007; Joint Management Committee, 2001).

This overrepresentation can be attributed in part to higher rates of placement at the conclusion of the initial child welfare investigation and substantiation phase. In Canada in 2003, 17% of Aboriginal children were placed in formal child welfare care following investigation compared to 6% of non-Aboriginal children. The rate of placement for Aboriginal children varies by provincial and territorial jurisdiction ranging from 9% in Ontario (Fallon et al., 2005) to 23% in Alberta (MacLaurin et al., 2006) and the Northwest Territories (MacLaurin, Trocmé, Fallon, Pitman, & McCormack, 2005).

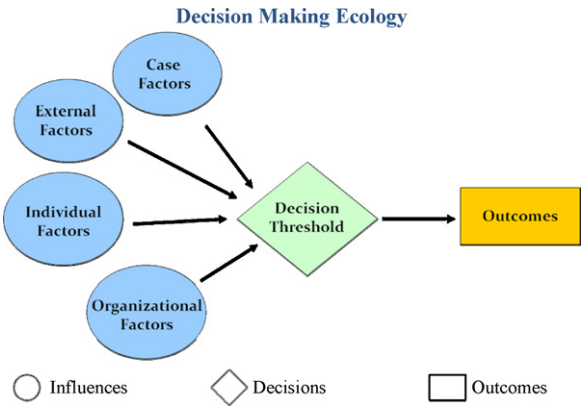


**Fig. 1.** Decision making ecology.

There is some evidence that the difference in rates of placement is impacted much more significantly by the presence of multiple risk factors than by ethno-racial status alone. Trocmé et al. (2004) found that children of Aboriginal heritage were 2.3 times more likely to experience a child maltreatment placement than non-Aboriginal children. However, when the clinical characteristics of the investigation are controlled for in the analysis, there was no statistically significant difference in the odds that Aboriginal children would experience child welfare placements compared to non-Aboriginal children (Trocmé et al., 2004). Race cannot be entirely ruled out as a contributor to the overrepresentation of Aboriginal children however as an analysis of First Nations children included in the second cycle of the CIS reported that First Nations children are 4.53 times more likely to be placed in care than non-Aboriginal children when controlling for the clinical factors (Trocmé et al., 2005).

The literature suggests that there is a need for both community-based responses and support at both the provincial and the federal levels in order to address the higher number of social, economic, and cultural risk factors prevalent within Aboriginal communities. Special attention should be given to exploring and addressing the multi-generational impacts of colonialism and discrimination through residential schools and child welfare that Aboriginal communities have endured (Blackstock & Trocmé, 2005).

*Racial overrepresentation in United States child welfare systems*

There is significant disproportionate representation of African American and Native American children in child welfare systems in the United States (Hill, 2007; Texas Health and Human Services Commission, 2006; Wulczyn & Lery, 2007). According to national data, African American children make up 15% of the national population, however approximately 37% of the children in the foster care system are African American (Wulczyn & Lery, 2007). In the states represented in the study conducted by Wulczyn and Lery (2007), African American children represent 19% of the population and 47% of the children placed in foster care, while White children make up 61% of the population and only 38% of children in foster care. In 2000, the rate of entry into foster care for African American children was 2.9 times that of White children (Wulczyn & Lery, 2007).

An analysis of racial disproportionality at national, state, and county levels revealed that African American children and Native American children are overrepresented at all levels of the child welfare system in the United States, and that the rates continue to rise the more intrusive the child welfare intervention was (Hill, 2007). There was variance in placement rates reported at the state-level, particularly in Washington State, where Hispanic families were overrepresented at all three stages and reported as twice as likely than White families to be investigated, substantiated, or placed in foster care (Hill, 2007). Unfortunately, data from Native American child welfare programs operated by tribal agencies are not collected by either the NCANDS or AFCARS data collection programs, so information regarding disparities among Native Americans is limited to those served by state and county agencies.

Wulczyn and Lery (2007) draw attention to urbanicity as a factor contributing to the racial disparity in foster care admissions in the United States, noting that African American families are more likely than White families to live in urban areas. Significant disparity rates were also reported in communities with lower percentages of African American residents, the lowest rates of children living in poverty, female-headed households, and adults with less than a high school education (Wulczyn & Lery, 2007). Poverty was found to play a significant role in the overrepresentation of African American children in the child welfare system (Texas Health and Human Services Commission, 2006; Wulczyn & Lery, 2007). Similarly, poverty has been tied to disparities in child maltreatment reporting (Drake, Lee, & Jonson-Reid, 2009) in Missouri.

Regional data presented by the Texas Health and Human Services Commission (2006) demonstrate that African American families are less likely than Anglo families to receive in-home family services and that African American children and Native American children are more likely to be removed from their homes than Anglo children and Hispanic children (Texas Health and Human Services Commission, 2006). When controlling for other relevant factors such as family income, age of victim, and type of abuse or neglect, data analysis revealed that in Texas, African American families are no more likely to have a child removed from their home than Anglo families (Texas Health and Human Services Commission, 2006). Data analysis has shown a significant interaction between poverty and neglect as contributing factors to Child Protective Services involvement (Drake et al., 2009; Texas Health and Human Services Commission, 2006).

*Impact of organizational and worker factors on child welfare decisions*

Organizations and workers who deliver child welfare services possess diverse characteristics. Although it is assumed that characteristics of organizations and workers influence child welfare service decisions, there is limited evidence that workers with different experience levels, education, training, and ethnic backgrounds make disparate service decisions. This is due in part to several common measurement issues noted in the child welfare worker literature reviewed. First, the few studies that have addressed the success and failure of child welfare interventions have not succeeded in evaluating and isolating which specific worker variables have contributed to those outcomes (Grasso & Epstein, 1988; Hoagwood, 1997; Yoo, 2002). Second, the child welfare literature generally does not include organizational variables as independent measures, although there is a substantial body of literature that addresses the importance of organizational characteristics in child welfare services as an outcome or dependent variable. Finally, the child welfare organizational literature is characterized by a lack of theoretical delineation and therefore clarity (Drasgow & Schmitt, 2002). There is a fundamental failure to explain why certain variables are considered important enough to be the focus of the research.

Several studies examine the presumed influence of worker ethnicity and related variables to the service outcomes experienced by clients. Worker ethnicity and education (Ryan, Garnier, Zyphur, & Zhai, 2006), ethnicity and gender (Woldeguiorguis, 2003), ethnicity and political ideology (Jayaratne, Faller, Ortega, & Vandervort, 2008), worker age and ethnicity (Surbeck, 2003) are theorized to be influences on the services received by a family in the child welfare system. In one of the few multivariate analyses examining client outcomes that included worker characteristics, Ryan et al. (2006) examined the role of worker turnover, racial match between worker and client, and a graduate degree in family reunification and the length of stay in care. While controlling for the clinical concerns of the case, the study found that White workers with a MSW degree were more likely to achieve family reunification for Hispanic children than African American caseworkers (Ryan et al., 2006). Jayaratne et al. (2008) found African American caseworkers more likely than White workers to consider race in both general and placement decisions and agreed more often with placing children in single parent families.

There is some evidence that education type can influence worker decisions. Britner and Mossler (2002) found that workers from various professions place different emphasis on the importance of certain information in cases of physical abuse when deciding whether a child should remain in the home or be placed in foster care. Kominkiewicz (2004) found that workers with a degree in psychology were more likely to identify siblings of the identified child as victims of maltreatment than social workers.

The decision to provide ongoing services after a child maltreatment investigation has serious resource implications in a fiscally constrained child welfare environment, Studies that have examined decisions to provide ongoing services have overlooked some key clinical factors associated with maltreatment; in particular, the failure to account for the severity of physical and emotional harm to the child (Inkelas & Halfon, 1997; Zuravin, Orme, & Hegar, 1995). Generally, substantiation is highly correlated with the decision to provide ongoing services (Depanfilis & Zuravin, 1999; Freeman, Levine, & Doueck, 1996; Winefield & Bradley, 1992). However, one study by Depanfilis and Zuravin (2001) found that families with a prior substantiated report were 22% less likely to receive ongoing services than families with no prior substantiated maltreatment. These findings support the DME related concept that workers may pay attention to factors other than relevant clinical ones when taking action.

There is evidence in the literature that suggests that intervention standards vary by neighborhood (Giovannoni & Becera, 1979; Johnson & L'Esperance, 1984; Wolock, 1982). Social workers rating a vignette were significantly more likely to make a decision to refer a case for ongoing services with limited information in high and low risk areas, than in medium risk areas (Craft & Bettin, 1991). Agencies located in high-risk areas were less likely to open an investigation with the same clinical issues than agencies in lower risk areas (Giovannoni & Becera, 1979).

Few studies are able to empirically account for organizational factors even when examining service decisions (Grasso & Epstein, 1988; Hoagwood, 1997; Yoo, 2002). Organizations serve diverse populations, but studies that examine differences in worker and organizational characteristics have not controlled for differences in the population served. Relevant clinical factors are rarely taken into consideration. Dissimilarities in clinical factors may explain divergent case dispositions for different groups. The aim of this study was to test the hypothesis that extraneous factors, specifically, organizational characteristics, impact the decision to place a child in out-of-home care. A secondary aim was to identify possible decision making influences related to disparities in placement decisions tied to Aboriginal children.

## Methods

To address the hypotheses regarding multi-level decision making factors, a secondary analysis of the *CIS-1998* dataset was conducted. This unique dataset contains information about key clinical factors collected during the course of a child maltreatment investigation. The investigations are also linked to the characteristics of the workers who conducted the investigation and the characteristics of the organization from which the investigation originated.

The *CIS-1998*'s primary objective was to produce a national estimate of the incidence of child maltreatment in Canada in 1998. Using a multi-stage sampling design, a representative sample of 51 child welfare sites was selected from 327 child welfare service areas in Canada. Three of the selected child welfare service areas were serviced by multiple overlapping agencies, and therefore there were 55 child welfare agencies in the final *CIS-1998* sample. At least one child welfare service area was chosen in each of the provinces and territories. In provinces with larger populations, further stratification occurred in order to account for agency size and geographic region. Data were collected directly from child protection workers about child welfare investigations conducted in the 55 selected sites, spanning a three-month case selection period from October 1, 1998 to December 31, 1998. Screened-in investigations were evaluated by study staff to ensure that they met the *CIS-1998* definitions of maltreatment. Investigations in which child maltreatment was alleged by the referral source or suspected during the investigation were included in the sample. Finally, only children in the household for whom maltreatment was alleged or suspected during the investigation were included in the final sample.

### *Data collection instruments*

The information was collected using a three-page data collection instrument. Data collected by this instrument included the following: type of abuse and neglect investigated; level of substantiation and duration of maltreatment; physical and emotional harm to the child; functioning concerns for the children and their caregivers; income source; housing information, and information about short-term service dispositions. The *CIS-1998* study also collected information about the participating

child welfare workers. Workers were asked their age, caseload size, educational degree, and years of experience in social services and child protection. They were also asked what additional training they had received in the course of their child protection experience. Information about organizational size and location was collected for the 55 participating sites. Forty sites completed an *Organizational Questionnaire* that included questions about the structure of the organization, organizational morale, staffing vacancies, and whether the organization had recently experienced a child fatality or had conducted a high-profile case.

*Study sample*

Only those child maltreatment investigations from the *CIS-1998* sample in which the worker had completed a *Worker Information Form* were selected. In Quebec, the *CIS-1998* design and survey instrument was modified to address a broader set of research questions, and therefore workers were not asked to complete a *Worker Information Form*. In the rest of Canada, 574 workers were asked to complete a *Worker Information Form*. 496 workers completed the instrument. These 496 investigating workers yielded a sample of 4,787 child maltreatment investigations in forty-seven child welfare agencies. As opposed to all children investigated, the subsample for this study was made up of investigations that remained open for ongoing services, in order to examine predictors of placement in out-of-home care ($n$ = 1,304 investigations).

## Measures

*Outcome variable: Formal placement (vs. no formal placement)*

Workers were asked to indicate one category that best described the placement decision for the investigation. The categories were: no placement required; placement is being considered; informal placement; foster placement; group home placement, and residential/secure treatment centre. The decision to place a child in out-of-home care or not place a child is a dichotomous variable.

*Level 1 variables*

Key clinical variables were included in the model in order to (a) reflect an ecological model of child maltreatment and to (b) determine the relative contribution of clinical variables and variables that, in principle, should be extraneous to the case disposition (specifically worker and organizational variables). Clinical variables were chosen because they represent the factors most understood in the literature to be related to child maltreatment or risk of child maltreatment. Worker and organizational variables were chosen to reflect those variables that have been theorized in literature as having an influence on services provided to children and families by child welfare agencies.

Table 1
provides the operational definitions and codes used in the analysis.

## Analysis plan

The analytic model appropriate here is the multi-level logistic regression equation. The traditional way of fitting multi-level models is via linear mixed models (Sullivan, Dukes & Losina, 1999), commonly known as hierarchical linear models (HLM). Although structural equation models (SEM) are parameterized very differently from linear mixed models, under a broad set of conditions they can lead to analytically identical solutions (Bauer, 2003; Curran, 2003). There are advantages and disadvantages for each of those two classes of methods. SEM allows for the introduction of latent classes, control and correction for measurement errors in variables and the possibility of omnibus measures of model fit (i.e., comparison to a saturated model). HLM is naturally extended to generalized linear mixed models, where a link function allows a non-linear transformation of the outcome variable to fit more general types of relationship between predictor and outcome variables. General link functions are not available in the SEM framework; however the statistical software MPlus 5 (Muthén & Muthén, 1998/2007) allows the specific case of the logistic link function for binary outcome variables under maximum likelihood estimation, such as logistic regression, as it is used in this study. Nevertheless, all regressions were replicated with the generalized linear mixed models under penalized quasi-likelihood estimation from the package MASS of the R software (Venables & Ripley, 2009). All significant $p$ values were concordant in the models fitted by both Mplus and R software; a majority equal, and with a minority having a small discrepancy at most at the third decimal.

One major goal of two-level regression is to partition the explained variance into individual (first level) and cluster (second level) variances (Merlo et al., 2006). Estimation of proportion of explained variance in both multi-level models (Gelman & Hill, 2007) and logistic regression (Mittlböck & Schemper, 1996) is a complex and still debated subject. It is therefore not surprising that the case of multi-level logistic regression is far from achieving a set of clear assumptions, error evaluations procedures, and summarizations that yield satisfying solutions based on broad methodological consensus. In order to produce an interpretable index, the simplest method is to compute the relative reduction in prediction error of a model compared to a null model (Schemper, 2003). The mean absolute error of prediction is computed directly from the

**Table 1**
Measures.

| Measures | Definition | Coding |
|---|---|---|
| Level 1 variable | | |
| Child age | Age of child, under or over six years | 1, <6 years<br>0, >6 years |
| Type of maltreatment | Physical abuse: child suffered or at risk of suffering physical harm at hands of caregiver<br>Sexual abuse: child has been or is at risk of being sexually molested or exploited<br>Neglect: child suffered, or safety is in danger, as a result of caregiver's failure to provide for or protect child<br>Emotional maltreatment: child suffered, or is at risk of suffering mental, emotional, or developmental problems from emotional abuse/neglect | 1, sexual abuse<br>0, physical abuse<br>0, neglect<br>0, emotional maltreatment |
| Physical harm | Defined as no harm, or at least one of: bruises/cuts/scrapes, burns and scalds, broken bones, head trauma, other health conditions, death | 1, some type of physical harm noted<br>0, no harm |
| Mental/emotional harm | Defined as mental or emotional harm caused by the investigated maltreatment. Is the child harmed by the action/inaction of caregiver | 1, some type of emotional harm noted<br>0, no harm |
| Child functioning | Functioning concerns can be confirmed or suspected, and include: developmental delay, physical/developmental disability, other health condition, substance abuse related birth defects, depression/anxiety, self-harming behavior, negative peer involvement, substance abuse, behavior problems in home/community, violence toward others, running, involvement in prostitution, age-inappropriate sexual behavior, psychiatric disorder criminal/Young Offenders Act involvement, special education class, irregular school attendance. Two dichotomous variables were created | 1, one child functioning concern<br>0, no child functioning concerns and two or more concerns<br>1, two or more child functioning concerns<br>0, no child functioning concerns and one concern |
| Caregiver functioning | Functioning concerns can be confirmed or suspected, and include: alcohol abuse, drug abuse, criminal activity, cognitive impairment, mental health problems, physical health issues, few social supports, history of domestic violence, caregiver history of maltreatment. Three dichotomous variables were created | 1, one caregiver concern<br>0, no caregiver concerns and two or more concerns<br>1, two caregiver concerns<br>0, no concern and one concern and three or more concerns<br>1, three or more concerns<br>0, no concerns and one concern or two concerns |
| Income source | Primary sources of income for up to two caregivers: full time employment, part time employment, multiple jobs, seasonal, unemployment insurance, social assistance, other benefits or pensions, no reliable source of income. If one caregiver had full time employment and the other caregiver had part time employment, the household income would be full time. Two dichotomous variables were created | 1, part time employment<br>0, other types of employment<br>1, other types of benefits (including social assistance)<br>0, part time and full time employment |
| Number of moves | The number of moves the household had experienced in the past six months. Two dichotomous variables were created | 1, one move<br>0, no moves and two or more moves<br>1, two or more moves<br>0, one move and no moves |
| Cooperation level | The level of cooperation with the investigation by the caregivers. If one caregiver was deemed not cooperative then the household level of cooperation was not cooperative | 0, not cooperative<br>1, cooperative |
| Extraneous case characteristics | | |
| Ethnicity | Ethno-racial categories developed by Statistics Canada for the 1998 Canadian Census. Groups include: White, Aboriginal, Chinese, Latin American, Filipino, Korean, Arab/West Asian, South Asian, Black, Japanese, Other. Ethnicity is a categorical variable that reflects the ethnicity of the household. If at least one caregiver is Aboriginal or a visible minority, the household ethnicity was considered Aboriginal or visible minority | 0, White household<br>1, Aboriginal or visible minority household |
| Level 2 variable | | |
| Worker position | Refers to a worker who performs only an intake function or has a generic caseload, performing investigation functions and services for ongoing family and/or child cases or other responsibilities. Agencies were given a code based on the workers within the agency | 1, the majority of the workers from an agency were intake workers<br>0, the majority of workers from an agency were classified as something other than intake workers |

Table 1 (*Continued*)

| Measures | Definition | Coding |
|---|---|---|
| Location of organization | Reflects the geographic location of the agency from which the child maltreatment was investigated | 1, a metropolitan site<br>0, the majority of workers from an agency were classified as something other than intake workers |
| Staffing vacancies | Agencies indicated whether there were unfilled staffing positions | 1, yes<br>0, no |
| Proportion of Aboriginal reports | The amount of investigations agencies conduct involving Aboriginal caregivers | 1, agencies with 20% or more investigations involving Aboriginal caregivers<br>0, agencies with less than 20% of investigations involving Aboriginal caregivers |

data for a constant-only (null) first-level logistic regression, $\widehat{D}$; this gives a 'benchmark' measure of error, along with the equivalent measure for a non-null model: $\widehat{D}_x$. Direct explained variation is then calculated: $(\widehat{D} - \widehat{D}_x)/\widehat{D}$.

Construction of the regression models went as follows. First, a model including all first-level variables was fitted (Table 3A). From this model were extracted predictors with a significant relationship ($p < .05$) to the decision to place. The model was then run with this smaller set of predictors, only retaining significantly associated predictors ($p < .05$). This last set of independent variables finally leads to a model where all regression coefficients were significantly different from zero ($p < .001$) (Table 4).

In a similar fashion to the first-level regression, a second-level only logistic regression was first fitted including all four agency-level predictors: *Unfilled positions*, *Worker position*, *Proportion of Aboriginal reports* and *Metropolitan* (Table 3B). Then, a multi-level model was fitted with the previously retained first-level variables and the four second-level variables (Table 4). Extracting agency-level variables without a significant relationship, using a critical value of $p = .01$ in Table 4, we arrive at our final model (Table 5), where all relationships are statistically significant ($p < .05$ for first-level variables, $p < .01$ for the second level).

To further assess the efficacy of the *Proportion of Aboriginal reports* second-level variable, a third set of regressions was analyzed to specifically understand the different roles of *Aboriginal* (at the first level) and *Proportion of Aboriginal reports* (at the second level). A fourth set of analyses was performed to estimate the stability of some regression coefficients by running the appropriate regression equations on several random subsamples.

## Results

### *Descriptives*

Twenty percent of investigations opened for ongoing child welfare services resulted in a placement in out-of-home care (Table 2). Thirty-four percent of investigations were physical abuse investigations; 9% of children were the focus of a sexual abuse investigation; 35% were neglect investigations, and in 21% of investigations the worker's primary concern was emotional maltreatment. Sixteen percent of the sample had been physically harmed, and in nearly one third of the sample emotional harm was evident. In over half of the investigations, the worker noted at least one concern for the child.

Thirty percent of the sample had moved at least once in the past 12 months, and over two thirds of the sample was either on social assistance or other income maintenance benefits or were employed only part time. In 80% of investigations, workers noted at least one caregiver functioning concern and in 42% of investigations, workers noted three or more concerns. In 22% of investigations, the caregiver or the child was of Aboriginal heritage.

### *Second-level variables*

Thirty-six percent of investigations originated from an agency with unfilled staffing positions and nearly two thirds of investigations were conducted by workers with an investigation specialist or intake designation. One third of investigations were conducted in agencies that had more than 20% clientele of Aboriginal origin.

### *Bi-variate analysis*

Bi-variate analyses were conducted between placement and clinically relevant variables, as well as variables that may influence the disposition but were deemed to be extraneous to the clinical assessment of a child maltreatment investigation. These include ethnicity, and worker level variables. All bi-variates were significant and were entered into the null model.

### *Multivariate analysis*

The final retained first-level predictors after the iterative procedure of variables elimination described earlier were *Emotional maltreatment*, *Emotional harm*, *Family moves in the previous year*, *Caregiver concerns* and *Cooperation*, all at $p < .001$ level of significance. This constitutes a final first-level model. For comparison purposes, a model containing only second-level pre-

**Table 2**
Unit of analysis: investigated/assessed children receiving services.

| | *N* (1,304) | Percent (100.00) |
|---|---|---|
| Variables | | |
| Dependent variable: formal placement | 256 | 19.63 |
| Independent variables | | |
| Child and family characteristics – level one (report child pair) | | |
| Child age (6 or over) | 812 | 62.27 |
| Type of maltreatment (presence of type) | | |
| Physical abuse | 451 | 34.59 |
| Sexual abuse | 113 | 8.67 |
| Neglect | 461 | 35.35 |
| Emotional maltreatment | 279 | 21.40 |
| Physical harm (present) | 215 | 16.49 |
| Mental or emotional harm (present) | 370 | 28.37 |
| Child functioning | | |
| Presence of one concern | 252 | 19.33 |
| Presence of two or more concerns | 420 | 32.21 |
| Previous case opening (present) | 703 | 53.91 |
| Caregiver functioning | | |
| Presence of one concern | 290 | 22.24 |
| Presence of two concerns | 272 | 20.86 |
| Presence of three or more concerns | 545 | 41.79 |
| Income source | | |
| Part time employment only | 174 | 13.34 |
| Social assistance only | 761 | 58.36 |
| Number of moves | | |
| One move | 266 | 20.40 |
| Two or more moves | 129 | 9.89 |
| Cooperation (present) | 1105 | 84.74 |
| Child ethnicity (Aboriginal) | 294 | 22.55 |
| Organizational characteristics – level two (local CPS agency) | | |
| Worker position (majority are intake workers) | 836 | 64.11 |
| Location of organization (metropolitan agency) | 479 | 36.70 |
| Staff vacancies (vacant positions) | 376 | 28.83 |
| Aboriginal investigations (20% or more of investigations are aboriginal caregivers) | 436 | 33.44 |

dictors was fitted (Table 3B): *Worker position, Location of organization, Staffing vacancies, and Proportion of Aboriginal reports*. This gives a direct explained variation of 12.47%.

Table 4 includes the retained first-level variables and the four second-level variables. The direct explained variation of this simultaneous multi-level model, 24.57%, is similar to the combined direct explained variation of single level models Table 3A (first level) and Table 3B (second level), 26.58%. This indicates that both sets of independent variables contribute to prediction in an almost additive fashion. The only second-level variable significant at the $p < .01$ level is *Proportion of Aboriginal reports*. This is thus the only predictor of this group to be included in the final model (Table 5). The size of the estimate for *Proportion of Aboriginal reports* (1.498) in Table 4 and the accompanying odds ratio (4.47) seemed surprisingly large. We therefore decided to conduct a small stability study of this estimate in Table 4. The model was run on five random subsamples half the size of the dataset, producing an average estimate of 1,463 with a standard deviation of .127, indicative of strong stability.

The final model (Table 5) includes our five retained first-level predictors and *Proportion of Aboriginal reports* at the agency level. Direct explained variation is 19.76%. On a common positive scale, odds ratios vary from 1.79 (*Cooperation*) to 3.08 (*Proportion of Aboriginal reports*).

Given that the agency-level variable *Proportion of Aboriginal reports* turned out to be such a strong predictor of placement, it was highlighted to further investigate the specific contributions of the child-level Aboriginal status (our variable *Ethnicity*) and agency-level *Proportion of Aboriginal reports*. To this end, all three non-null combinations of these two predictors defined the three models: (1) *Ethnicity* and *Proportion of Aboriginal reports*, (2) *Ethnicity* and (3) *Proportion of Aboriginal reports*. The first and third models lead to identical estimates of direct explained variation to the second decimal. The regression estimate for *Ethnicity* in model (1) is essentially zero, with a first-level $R^2$ of zero. This gives strong support to the notion that it is agency-level characteristics that explain the higher rate of placement among Aboriginal peoples in the Canadian youth protection system.

**Table 3**
Multi-level logistic regression – full models.

| Variables | Estimate | *SE* | Estimate/*SE* | *p*-Value | Odds ratio | 95% | C.I. |
|---|---|---|---|---|---|---|---|
| Model 2A (level one only) | | | | | | | |
| Child and family characteristics – level one (report child pair) | | | | | | | |
| Child age (6 or over) | .132 | .190 | .694 | .488 | 1.141 | .786 | 1.656 |
| Type of maltreatment (presence of type) | | | | | | | |
| Physical abuse | .029 | .335 | .087 | .930 | 1.029 | .534 | 1.985 |
| Sexual abuse | | | | | | | |
| Neglect | .535 | .325 | 1.643 | .100 | 1.707 | .903 | 3.228 |
| Emotional maltreatment | −.781 | .375 | −2.081 | .037 | .458 | .220 | .955 |
| Physical harm (present) | .558 | .212 | 2.626 | .009 | 1.747 | 1.153 | 2.647 |
| Mental or emotional harm (present) | .843 | .189 | 4.465 | .000 | 2.323 | 1.604 | 3.365 |
| Child functioning | | | | | | | |
| Presence of one concern | −.080 | .232 | −.346 | .730 | .923 | .586 | 1.455 |
| Presence of two or more concerns | .308 | .203 | 1.516 | .130 | 1.361 | .914 | 2.026 |
| Previous case opening (present) | .231 | .171 | 1.352 | .176 | 1.260 | .901 | 1.761 |
| Caregiver functioning | | | | | | | |
| Presence of one concern | −.270 | .314 | −.859 | .390 | .763 | .413 | 1.413 |
| Presence of two concerns | .035 | .311 | .112 | .911 | 1.036 | .563 | 1.905 |
| Presence of three or more concerns | .691 | .278 | 2.482 | .013 | 1.996 | 1.157 | 3.441 |
| Income source | | | | | | | |
| Part time employment only | −.063 | .283 | −.223 | .823 | .939 | .539 | 1.635 |
| Social assistance only | .217 | .204 | 1.066 | .286 | 1.242 | .833 | 1.853 |
| Number of moves | | | | | | | |
| One move | .069 | .204 | .341 | .733 | 1.071 | .718 | 1.598 |
| Two or more moves | 1.120 | .246 | 4.544 | .000 | 3.065 | 1.892 | 4.964 |
| Cooperation (present) | −.700 | .215 | −3.249 | .001 | .497 | .326 | .757 |
| Child ethnicity (Aboriginal) | .248 | .190 | 1.303 | .193 | 1.281 | .883 | 1.860 |
| $R^2$ | .244 | .032 | 7.643 | .000 | | | |
| Direct explained variation | 16.73% | m.a.e. | .26281 | | | | |
| Model 2B (level two only) organizational characteristics – level two (local CPS agency) | | | | | | | |
| Worker position (majority are intake workers) | −.231 | .499 | −.464 | .643 | .79 | .30 | 2.11 |
| Location of organization (metropolitan agency) | .585 | .461 | 1.270 | .204 | 1.79 | .73 | 4.43 |
| Staff vacancies (vacant positions) | −.680 | .465 | −1.462 | .144 | .51 | .20 | 1.26 |
| Aboriginal investigations (20% or more of investigations are aboriginal caregivers) | 1.417 | .451 | 3.141 | .002 | 4.12 | 1.70 | 9.98 |
| $R^2$ | .491 | .119 | 4.114 | .000 | | | |
| Direct explained variation | 12.47% | m.a.e. | .276 | | | | |

## Discussion

The objective of the analysis presented above was to try and utilize a combination of a theoretical perspective, the DME (Baumann, Kern, & Fluke, 1997), supported by multi-level procedures to identify key factors associated with placement decisions among children who were investigated and received services. The model tested was focused on identifying sets of factors at both case and agency levels of the DME.

While several candidate variables at the case level believed to influence the decision to place were examined, the final model includes only five. Key among those that increase the likelihood of placement are evidence of emotional harm, having two or more recent moves prior to the investigation, and concerns regarding caregiver functioning. Case factors that appear to be associated with reduced likelihood of placement include the presence of a report of emotional maltreatment and the cooperation of the caregiver. The analysis conducted in this study supports the basic findings from studies of the CIS regarding the case-level characteristics that are associated with the decision to place a child (Fallon & Trocmé, in press). The presence of risk as manifested by concerns regarding caregiver functioning and recent moves is consistent with other prior research (Rivaux et al., 2008).

Notably absent from the case variables is the direct contribution of the Aboriginal status of the child. From the study data, overall odds of placement for Aboriginal children compared to non-Aboriginal children is approximately 1.2; but while statistically significant in the bi-variate (OR = 1.53, $p = 007$) form, the variable is non-significant in the multivariate analysis. This lack of a statistically significant relationship between Aboriginal status and placement in multivariate contexts using the CIS is also consistent with findings from the CIS-1998 studies (Trocmé et al., 2004).

**Table 4**
Model 1 (parsimonious level one and full level two).

| Variables | Estimate | *SE* | Estimate/*SE* | *p*-Value | Odds ratio | 95% | C.I. |
|---|---|---|---|---|---|---|---|
| Child and family characteristics – level one (report child pair) | | | | | | | |
| Type of maltreatment (presence of type) | | | | | | | |
| Emotional maltreatment | −.926 | .279 | −3.323 | .001 | .396 | .229 | .684 |
| Mental or emotional harm (present) | 1.076 | .202 | 5.335 | .000 | 2.933 | 1.974 | 4.358 |
| Number of moves | | | | | | | |
| Two or more moves | .955 | .290 | 3.298 | .001 | 2.599 | 1.472 | 4.588 |
| Caregiver functioning | | | | | | | |
| Presence of three or more concerns | 1.140 | .204 | 5.590 | .000 | 3.127 | 2.096 | 4.664 |
| Cooperation (present) | −.584 | .267 | −2.188 | .029 | .558 | .330 | .941 |
| $R^2$ | .218 | .038 | 5.737 | .000 | | | |
| Organizational characteristics – level two (local CPS agency) | | | | | | | |
| Worker position (majority are intake workers) | −.350 | .459 | −.763 | .446 | .705 | .287 | 1.733 |
| Location of organization (metropolitan agency) | .881 | .415 | 2.124 | .034 | 2.413 | 1.070 | 5.443 |
| Staff vacancies (vacant positions) | −.300 | .423 | −.709 | .478 | .74 | .32 | 1.70 |
| Aboriginal investigations (20% investigations are aboriginal caregivers) | 1.498 | .414 | 3.621 | .000 | 4.473 | 1.987 | 10.069 |
| $R^2$ | .572 | .120 | 4.777 | .000 | | | |
| Direct explained variation | 24.57% | m.a.e. | .23805 | | | | |

Child age is also commonly associated with placement likelihood, particularly among very young children; however it was not found to contribute as a determinant at the case level. Similarly, the income status of the family did not contribute significantly to the multivariate model at the case level, whereas over 58% of families receiving social assistance had a child placed. Other studies of placement decisions have shown the impact of poverty on placement decisions (Baumann et al., 2009; Rivaux et al., 2008). While poverty as measured by the absence of employment is not a major contributing factor at the case level, its role may operate in a different fashion at the agency level.

The single agency-level factor that remains in the final model is the proportion of Aboriginal children in the caseload. This finding was very stable when tested over several different levels of proportionate caseload representation ranging from greater than 50% to 20% of the caseload. The other agency-level variables in the model, including staff vacancies, degree of intake specialization, and whether the agency was located in an urban area, did not contribute to the model. While several candidate factors influencing placement decisions are conceivable at the agency level, increased placement disparities for African American children compared to White children were found to be correlated with a corresponding decrease in population density of counties in the United States (Wulczyn et al., 2005). Nonetheless, only the proportion of Aboriginal peoples in the agency caseload was statistically significant.

**Table 5**
Model 2 (parsimonious level one and parsimonious level two).

| Variables | Estimate | *SE* | Estimate/*SE* | *p*-Value | Odds ratio | 95% | C.I. |
|---|---|---|---|---|---|---|---|
| Child and family characteristics – level one (report child pair) | | | | | | | |
| Type of maltreatment (presence of type) | | | | | | | |
| Emotional maltreatment | −1.035 | .255 | −4.067 | .000 | .355 | .215 | .586 |
| Mental or emotional harm (present) | 1.021 | .174 | 5.881 | .000 | 2.776 | 1.974 | 3.904 |
| Number of moves | | | | | | | |
| Two or more moves | 1.067 | .246 | 4.329 | .000 | 2.907 | 1.795 | 4.708 |
| Caregiver functioning | | | | | | | |
| Presence of three or more concerns | .900 | .174 | 5.174 | .000 | 2.460 | 1.749 | 3.459 |
| Cooperation (present) | −.580 | .232 | −2.499 | .012 | .560 | .355 | .882 |
| $R^2$ | .195 | .033 | 5.975 | .000 | | | |
| Organizational characteristics – level two (local CPS agency) | | | | | | | |
| Worker position (majority are intake workers) | | | | | | | |
| Location of organization (metropolitan agency) | | | | | | | |
| Staff vacancies (vacant positions) | | | | | | | |
| Aboriginal investigations (20% investigations are aboriginal caregivers) | 1.124 | .328 | 3.425 | .001 | 3.077 | 1.618 | 5.853 |
| $R^2$ | .327 | .131 | 2.492 | .013 | | | |
| Direct explained variation | 19.76% | m.a.e. | .25324 | | | | |

The presence of the proportion of Aboriginal families in the caseload of the agency could be interpreted merely as an indicator of overall poverty of the community where the agency is based. This may be a partial explanation; however many of the communities where CIS agencies are located with very low levels of aboriginal caseloads are impoverished. Furthermore, the poverty of individual families was not found to be a determinant of increased likelihood of placement. Thus an obvious possibility is that the relatively large agency caseloads of Aboriginal families reflect communities that include relatively large numbers of Aboriginal families. Given that the presence of a high proportion of Aboriginal families on the caseload is associated with in an increased likelihood of placement, it suggests that either practice or service resources are somehow different among these agencies.

### Limitations of CIS dataset

There are limitations in the design of the *CIS-1998*. Workers who were primarily responsible for conducting the child maltreatment investigation completed the data collection instrument at the conclusion of the investigation. These ratings were not independently verified, including the type of maltreatment investigated and the level of substantiation. It is possible that this could influence the variables examined in the analysis. Workers could first make decisions about the case and then complete the data collection instrument to justify their judgments. The conclusions made about the investigation as represented in the dataset usually reflected a time period of 30 days. Child functioning issues, caregiver functioning problems, and other key risk factors may not have been known to the investigating worker at the time the data collection instrument was completed. Cases that were screened out by a child welfare authority or investigated only by the police were not included in the study. Cases that were known to a community member or maltreatment that was known only to the child were also not included in the dataset.

The primary objective of the *CIS-1998* was to provide a reliable estimate of the incidence of child maltreatment in Canada. Although information was collected about workers and agencies, the purpose of the study was not to consider these variables. Key concepts in the literature that related to human resources, such as worker stress, worker burnout, and levels of social support were not measured. These are theorized in the literature as having influence in the delivery of child welfare services.

### Implications for policy

Aboriginal children are overrepresented in the child welfare system in Canada (Blackstock, 2005), but this study does not have any analytic results indicating that this is due to differential decision making regarding specific children or families. On the other hand, it does support the idea that disparities may be occurring at the agency level. The hypothesis that Aboriginal caseload may reflect a broader issue with respect to resource availability is supported by other studies in as much as there is a clear gap in the service supports for Aboriginal children. Aboriginal children receive less funding per child for federal child welfare services, and families living on reserve receive have been found to receive minor support from the voluntary sector (Blackstock, 2005; Blackstock & Trocmé, 2005).

The literature also suggests that there is a need for both community-based responses and support at both the provincial and the federal level in order to address the higher number of social, economic, and cultural risk factors affecting Aboriginal communities, drawing particular attention to the history of colonialism and discrimination through residential schools and child welfare that Aboriginal communities have endured (Blackstock & Trocmé, 2005).

There is a need for short, medium, and long-term investment in Aboriginal communities to help reduce the representation of Aboriginal children in the child welfare system. Wein, Blackstock, Loxley, and Trocmé (2007) suggest starting by ensuring Aboriginal child welfare services are culturally based and reflective of the needs of Aboriginal children and families.

The value of this study was the capacity to separate out factors that influenced placements at both the case and agency levels. In doing so it became possible to provide additional evidence supporting the possibility that one source of overrepresentation of Aboriginal children in the Canadian foster care system is a lack of appropriate resources at the agency or community level that might be effective at reducing the need for placement. Additional work is needed to isolate more precise components of what the proportion of Aboriginal families on the caseload means and implies. For example, an analysis of ancillary data can addresses precisely what services and resources are available at the agency level. What does seem clear is that a good place to look for explanations of disparities will be at the agency or community level.

Finally, equity in child welfare funding and the need to ensure services to Indigenous children are culturally based are reinforced by the United Nations Convention on the Rights of the Child (1989) Article 19, the United Nations Committee on the Rights of the Child General Comment on the Rights of Indigenous Children (2009) and the United Nations Declaration on the Rights of Indigenous Peoples (2008).

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