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Placement decisions and disparities among Aboriginal children: Further analysis of the Canadian incidence study of reported child abuse and neglect part A: Comparisons of the 1998 and 2003 surveys

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ABSTRACT

Objective: Fluke et al. (2010) analyzed Canadian Incidence Study on Reported Child Abuse and Neglect (CIS) data collected in 1998 to explore the influence of clinical and organizational characteristics on the decision to place Aboriginal children in an out-of-home placement at the conclusion of a child maltreatment investigation. This study explores this same question using CIS data collected in 2003 which included a larger sample of Aboriginal children and First Nations child and family service agencies.

Methods: The decision to place a child in an out-of-home placement was examined using data from the *Canadian Incidence Study of Reported Child Abuse and Neglect-2003* and a reanalysis of CIS-1998 data (Fluke et al., 2010). The CIS-2003 dataset includes information on nearly 12,000 child maltreatment investigations from the time of report to case disposition. The CIS-2003 also captures information on the characteristics of investigating workers and the child welfare organizations for which they work. Multi-level statistical models were developed to analyze the influence of clinical and organizational variables using MPlus software. MPlus allows the use of dichotomous outcome variables, which are more reflective of decision-making in child welfare and facilitates the specific case of the logistic link function for binary outcome variables under maximum likelihood estimation.

Results: Final models revealed the proportion of investigations conducted by the child welfare agency involving Aboriginal children was a key single agency level predictor of the placement decision. Specifically, the higher the proportion of investigations of Aboriginal children, the more likely placement was to occur. Contrary to the findings in the first paper (Fluke et al., 2010), individual Aboriginal status also remained significant in the final model at the first level.

Conclusions: Further analysis needs to be conducted to further understand individual and organizational level variables that may influence decisions regarding placement of Aboriginal children. There is also a need for research that is sensitive to differences among, and between, Métis, First Nations and Inuit communities. Results are not generalizable to Québec because data from this province were excluded.

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Introduction

The Auditor General of Canada (2008) estimates that First Nations children are more likely to be placed in "out-of-home" placements than non-Aboriginal children. Despite the striking overrepresentation there are few studies on the factors driving the overrepresentation to inform policy and practice. This paper builds on the work of Fluke, Chabot, Fallon, MacLaurin, and Blackstock (2010), which examined the contribution of organizational factors to out-of-home placement using data from the 1998 cycle of the *Canadian Incidence Study of Reported Child Abuse and Neglect* (CIS-1998) (Trocmé et al., 2001). Fluke et al. (2010) found that the single agency level factor contributing to the decision to place a child in an out-of-home placement was the proportion of Aboriginal children investigated by the agency. The higher the proportion of Aboriginal children investigated by the agency the more likely a child was to be placed in an out-of-home placement. Notably absent was the direct contribution of the Aboriginal status of the child (Fluke et al., 2010). This lack of a statistically significant relationship between the child's Aboriginal status and placement when controlling for the clinical concerns of the investigation, is consistent with findings from another analysis of the CIS-1998 study (Trocmé, Knoke, & Blackstock, 2004). The purpose of this paper is to examine whether these same findings emerge in an analysis of the CIS-2003 data.

The previous paper (Fluke et al., 2010) and the current analysis utilize the *Decision Making Ecology* (DME). Child welfare research suggests that placement decision factors influencing action thresholds can be described as part of the decision making process which includes characteristics of the case worker, the agency, as well as other external factors (Baumann, Dalgleish, Fluke & Kern, 2011; Baumann, Kern, & Fluke, 1997; Dalgleish, 1988). As shown in Fig. 1, these factors can be operationalized using a multi-level model. 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. Compared to non-Aboriginal children, Aboriginal children have a well-documented higher likelihood to be present across all child welfare decision making points including reports, substantiation, and out-of-home placement (Auditor General of Canada, 2008; Blackstock, Prakash, Loxley & Wein, 2005; McKenzie, 1997; Royal Commission on Aboriginal Peoples, 1996; Trocmé et al., 2004). There are three major cultural groups of Aboriginal peoples recognized in the Canadian Constitution: the Metis peoples, the Inuit and First Nations. There is rich linguistic and cultural diversity among these groups; for example, there are over 600 First Nations in Canada speaking at least 50 different languages (Blackstock et al., 2005). Analysis based on national census data noted that while 6% of children in Canada were Aboriginal in 2008, Aboriginal children made up 22% of substantiated reports of child maltreatment (Trocmé et al., 2010).

The most reliable source of data on Aboriginal children in the Canadian child welfare system comes from the CIS (Public Health Agency of Canada (PHAC, 2010; Trocmé et al., 2005, 2001). This cross sectional study conducted in five-year cycles collects data on child welfare reports to the point of case disposition. CIS has collected disaggregated data on Aboriginal children from the inception of the study to better detect differences among the three major Aboriginal cultural groups in Canada (First Nations, Métis and Inuit). In 2003, 17% of substantiated investigations involving Aboriginal children resulted in a formal out-of-home placement, compared to 6% of non-Aboriginal children. An additional 11% of Aboriginal children were placed in an informal out-of-home placement (kinship care) while 4% of non-Aboriginal children were placed informally
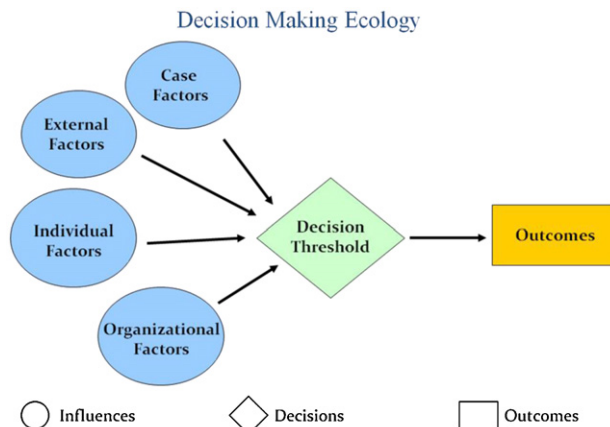

Fig. 1. Decision making ecology.

(Trocmé et al., 2005). In 2003, the rate of formal child welfare placement for Aboriginal children varied by provincial and territorial jurisdiction ranging from 9% in Ontario (Fallon et al., 2005) to 23% in Alberta (MacLaurin et al., 2005) and the Northwest Territories (MacLaurin et al., 2006). Kiskisik Awaksisak is the first report using CIS-2008 data to specifically examine child welfare investigations involving First Nations children in Canada (Sinha et al., 2011). In 2008, for every 1,000 First Nations children living in the geographic areas served by sampled agencies, there were 140.6 child maltreatment related investigations in 2008; for every 1,000 non-Aboriginal children living in the geographic areas served by sampled agencies, there were 33.5 investigations in 2008 (Sinha et al., 2011).

Research from the CIS suggests that case characteristics such as child maltreatment type, child functioning and harm levels do not account for the significant overrepresentation of Aboriginal children in out-of-home placements. Case factors that have been demonstrated to be strongly related to all decision points in the overrepresentation of Aboriginal children in the child welfare system are poverty, poor housing and substance misuse (Trocmé et al., 2004, 2005). These factors, when coupled with inequitable resources for First Nations children residing on reserves have resulted in the overrepresentation of Aboriginal children in the Canadian child welfare system (Auditor General of Canada, 2008, 2011; Standing Committee on Public Accounts, 2009). Aboriginal families are more likely to live in poverty and inadequate housing than other Canadians (Loppie-Reading & Wien, 2009; National Council on Welfare, 2008) which likely contributes to the importance of these factors for Aboriginal children who come into contact with the child welfare system.

There is emerging literature suggesting there are significant within group variations among Aboriginal people in Canada, with research highlighting differences in the out-of-home placement rates among First Nations, Métis and Inuit peoples in Canada. For example, an analysis of placement rates reported in provincial administrative data in comparison to 2001 census data in three sample provinces suggested that 10% of all First Nations children were in child welfare placements versus 3% of all Métis children and less than 1% of non-Aboriginal children (Blackstock et al., 2005). The Auditor General of Canada (2008) also found significant placement rate differences among the 422 First Nations agencies in Canada served by the First Nations child and family service program with placement rates varying from 0 to 28% of all First Nations children on reserves. Factors relating to these differences have not been fully explored. Overall the Auditor General of Canada (2008) suggests that First Nations children are six to eight times more likely to be placed in an out-of-home placement than non-Aboriginal children. This overrepresentation can be attributed in part to higher rates of placement at the conclusion of the initial child welfare investigation and substantiation phase. The literature suggests that there is a need for both community-based responses and support at the provincial/territorial and the federal levels in order to address the higher number of social, economic, and cultural risk factors prevalent in Aboriginal communities (Blackstock & Trocmé, 2005; Loppie-Reading & Wien, 2009).

Overrepresentation of Aboriginal children outside of Canada. The overrepresentation of Aboriginal children in the child welfare system is a concern in other developed countries such as USA and Australia. Research conducted in these countries point to important similarities with Aboriginal peoples in Canada. For example, the overrepresentation of indigenous children (Aboriginal in Canada, Native American in USA, Indigenous in Australia) in all three countries can substantially be accounted for by neglect concerns primarily driven by socio-economic factors such as poverty and poor housing and multi-generational impacts of colonization and inequitable resource distribution (Blackstock, 2009).

National child welfare data in the United States (USA) have been criticized for under-representing Native American children (Blackstock, 2009; Earle-Fox, 2004) as data from Native American child welfare programs operated by tribal agencies is not collected by either the National Child Abuse and Neglect Data System (NCANDS) nor Adoption and Foster Care Analysis and Reporting System (AFCARS) data collection programs. There is evidence in USA however suggesting that Native American children are disproportionately represented among child welfare reports, investigations, and out-of-home placements (Carter, 2010; Magruder & Shaw, 2008; Olesnavage, Preston, Sorrells, and Tadgerson (2010); Richardson, 2008; Texas Department of Family and Protective Services, 2010). Carter (2010) found that 2% of urban Native American children were in foster care despite representing only 1% of the urban child population. Even when non-Aboriginal caregivers are found to have greater substance abuse issues than their Native American counterparts, Native American children are still more likely to be taken into out-of-home placements (Carter, 2010). Olesnavage et al. (2010) criticized the US Child Welfare system for its failure to identify Native-American children and families early enough in the child protection process and an overall lack of culturally appropriate service provision. Furthermore, they noted insufficient efforts to connect with Aboriginal leaders and promote reunification with families.

In Australia, Indigenous children are three times more likely to be reported to child welfare, four times more likely to be investigated and substantiated for maltreatment, six times more likely to receive a court order, and seven times more likely to enter out-of-home placements (Tilbury, 2009). Concerns of domestic violence, substance abuse, and caregiver mental health were indicators of out-of-home placement for Indigenous children (particularly infants who account for 20% of all infants in placements) (Zhou & Chilvers, 2008). Macro-level factors, such as colonization, immigration, racism, and the intergenerational effects of poverty were found to drive placement discrepancies. More specific to micro-level systems, agency factors such as institutional racism, culturally inappropriate services, discriminatory practices and potential bias were all found to impact decision making for Aboriginal children (Sullivan & Charles, 2010; Tilbury & Thoburn, 2009). Overall, studies pointed towards poverty, child age, unemployment, and caregiver risk factors as contributing to the driving force of placement for Aboriginal children (Bowman, Hofer, O'Rourke, & Read, 2009; Sullivan & Charles, 2010; Tilbury & Thoburn, 2009).

Much of the data on the over representation of Indigenous children in child welfare in Australia, Canada and the USA comes from cross-sectional studies or administrative data sets. Longitudinal analysis of child welfare notifications among a group of Aboriginal children in Australia born in 1991 found that by 2006, an astounding 56% of Aboriginal children had been the subject of at least one child welfare notification as compared to 11% of non-Aboriginal children (Delfabbro, Hirte, Rogers, & Wilson, 2010). These findings suggest longitudinal analysis would also be useful in better understanding the incidence and nature of overrepresentation of Indigenous children in other countries including Canada.

Impact of organizational and worker factors on child welfare decisions. Organizations responsible for the delivery of child welfare services in North America reflect diversity in their organizational mandate and service orientation (Fallon et al., 2005), and workers within these organizations vary with respect to their age, experience, education, training and position specialization (Fallon, MacLaurin, Trocmé, Gail, & Golden, 2011). Although it is assumed that characteristics of organizations and workers influence child welfare service decisions, there is limited evidence that workers within different organizational settings make disparate service decisions. This is due, in part, to a number of measurement issues noted in the child welfare literature. First, the studies exploring the success and failure of child welfare interventions have not succeeded in evaluating and isolating the specific worker variables contributing to these 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. Third, research examining the impact of worker and organizational factors on decision making has generally used case vignettes rather than child welfare data and there may be differences noted between hypothetical and actual decisions (Ashton, 2007; Hollingsworth, Bybee, Johnson, & Swick, 2010). Fourth, the child welfare organizational literature is characterized by a lack of theoretical delineation and clarity on which variables are considered as the focus of research (Drasgow & Schmitt, 2002). Finally, research has not clearly examined the contribution of worker, organizational or community level factors to child welfare decisions in Indigenous communities compared to mainstream child welfare agencies.

Thus, 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 examining differences in worker and organizational characteristics have not controlled for differences in the population served. Relevant clinical factors are not consistently taken into consideration. Dissimilarities in clinical factors may explain divergent case dispositions for different groups. The decision to provide ongoing services after a child maltreatment investigation has serious resource implications. In a fiscally-constrained child welfare service environment, decisions regarding the targeting and deployment of scarce resources needs to be better understood particularly with respect to over-represented groups such as Indigenous children (Blackstock, 2009).

Methods

To test the contribution of multilevel factors to the placement decision and in particular the role of Aboriginal status of the child and the proportion of Aboriginal children investigated by the agency, a secondary analysis of the CIS-2003 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 focus in this paper is testing the appropriateness and replicability of the multi-level models developed for the *CIS-1998* data. The description of the methodology focuses on the *CIS-2003* analysis.

The *CIS-2003*'s primary objective was to produce a national estimate of the incidence of child maltreatment in Canada in 2003. Using a multi-stage sampling design, a sample of 57 child welfare agencies, including eight First Nations child and family service agencies, was selected from 400 child welfare service areas in Canada. A stratified cluster sampling design is used first to select a representative sample of child welfare offices and then to sample cases within these offices. Québec investigations did not provide enough information to be included in this analysis. In Québec, a common information system was implemented just prior to data collection for the CIS-2003. Thus it was not feasible to collect data directly from investigating workers. Although this approach provided a basis for deriving selected national estimates that include Québec, there was not sufficient correspondence between the fields for other data to be included. Further, Québec did not collect information about workers or organizations in 1998 or 2003 and investigations from Québec were not included in the original paper. The data analyzed in this paper are representative of Canada, excluding the province of Québec.

Cases opened for service at the randomly selected agencies between October 1st and December 31st in 2003 were eligible for inclusion. In several Aboriginal jurisdictions, data collection included cases opened in January 2004. This adjustment was made to accommodate late enrollment of some First Nations child and family service agencies. Three months was considered to be the optimum period to maintain participation and compliance with study procedures. 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 included: Aboriginal heritage of the child and caregiver(s), 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 (e.g., referrals to services, case opened for ongoing child welfare services, out-of-home placement, child welfare court application).

The CIS-2003 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 57 participating agencies.

It is important to note that child welfare delivery to Aboriginal children in Canada happens through two types of agencies which are both included in the CIS although to significantly different proportions. The dominant group of agencies participating in the CIS are mainstream agencies delivering child welfare services to Aboriginal and non-Aboriginal children living off reserves throughout the country. There are a limited number of Métis child and family service agencies and urban Aboriginal child and family service agencies that also deliver services off reserve but no Métis agencies were included in the 2003 cycle and only one urban Aboriginal agency was included. The CIS-2003 cycle included eight First Nations child and family service agencies operating on reserves in Canada (excluding Québec) representing 15% of the Aboriginal cases. This means that the vast majority of data on Aboriginal children in CIS-2003 is derived from mainstream agencies serving off reserve Aboriginal children.

Study sample

Only those child maltreatment investigations from the CIS-2003 sample in which the worker had completed a *Worker Information Form* were selected. Nine-hundred and thirty-six investigating workers yielded a sample of 11,562 child maltreatment investigations in 57 child welfare agencies. Eighty-seven percent of workers completed a *Worker Information Form* ($n = 819$). The sub-sample for this study was made up of investigations that remained open for ongoing services ($n = 2,059$ investigations), in order to examine predictors of placement in out-of-home care. Investigations with the exposure to domestic violence as the primary concern for the investigation were excluded from this analysis because the short term service dispositions (including placement) for these investigations differed significantly from other maltreatment types (Black, Trocme, Fallon, & MacLaurin, 2008).

Measures

Outcome variable: Formal placement versus no formal placement. Workers were asked to select one category that best described the placement decision for the investigation. The categories included: no placement required; placement is being considered; informal placement; foster placement; group home placement; and residential/secure treatment center. The decision to place a child is a dichotomous variable: yes (informal placement; foster placement; group home placement; and residential/secure treatment center) or no (no placement required; placement is being considered).

Level one and level two variables. Key clinical variables were included in the model to reflect an ecological model of child maltreatment and to 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 related to child maltreatment or risk of child maltreatment were selected based on extant literature. Worker and organizational variables that influence services provided to children and families by child welfare agencies were chosen based on theoretical literature. Table 1 presents the operational definitions and codes used in the analysis.

Analysis plan

The analytic model chosen was multilevel logistic regression. The traditional way of fitting multilevel models is via linear mixed models (Sullivan, Dukes, & Losina, 1999), commonly known as hierarchical linear models (HLM). 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 relationships between predictor and outcome variables. An alternate framing of multilevel models is through the use of latent variables. The statistical software MPlus 5 (Muthén & Muthén, 1998–2007) is specifically designed for latent variable modeling, and allows regression equations with a logistic link function for binary outcome variables under maximum likelihood estimation (i.e., 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 reported were concordant in the models fitted by both Mplus and R software, as well as parameter estimates, with MPlus slightly more conservative.

A first set of descriptive analyses were conducted to evaluate the comparability of the 1998 and 2003 data, in particular with regard to the relationship of *Aboriginal status* and *Proportion of Aboriginal reports* with *placement*, using data from the nine

Table 1
Variable definitions.

Outcome variable	Measurement	Description
Placement	Dichotomous variable Placement (1) No placement (0)	Placement: formal kinship care, other family foster care, group home and residential/secure treatment No placement: no placement, considering placement and informal kinship care
Level 1 variables		
Child age	Dichotomous variable Child 6 years of age or younger (1) Child 7 years of age or older (0)	Children 15 years of age and under
Type of maltreatment	Four dichotomous variables Physical abuse; sexual abuse; neglect and emotional maltreatment	Primary form of maltreatment
Physical harm	Dichotomous variable Harm (1) No harm (0)	Defined as bruises/cuts/scrapes, burns and scalds, broken bones, head trauma, other health conditions
Mental or emotional harm	Dichotomous variable Emotional harm (1) No emotional harm (0)	Defined as the degree to which the child has been harmed by the action or inaction of the caregiver
Child functioning	Two dichotomous variables One child functioning concern (1) No concerns or two or more concerns (0); Two or more child functioning concerns (1) No concerns and one concern (0)	Functioning concerns include: depression/anxiety, ADD/ADHD, negative peer involvement, alcohol abuse, drug/solvent abuse, self-harming behavior, violence towards others, running (one incident and multiple incidents), inappropriate sexual behavior, other behavioral/emotional problems, learning disability, special education services, irregular school attendance, developmental delay, physical disability, substance abuse related birth defects, positive toxicology at birth, other health conditions, psychiatric disorder, Youth Criminal Justice Act involvement and other functioning issues.
Previous case opening	Dichotomous variable Yes (1) No (0)	Previous case opening for any caregiver in the family
Caregiver functioning	Three dichotomous variables One caregiver concern (1) No caregiver concerns and two or more concerns (0); Two caregiver concerns (1) No concern and one concern and three or more concerns (0); Three or more caregiver concerns (1) No concerns and one concern or two concerns (0)	Functioning concerns include: alcohol abuse, drug/solvent abuse, criminal activity, cognitive impairment, mental health issues, physical health issues, few social supports, maltreated as a child, victim of domestic violence, perpetrator of domestic violence
Income source	Two dichotomous variables Part time employment (1) All other situations (0); Benefits (including social assistance) (1) All other types of employment (0)	Primary sources of income included: full time employment, part time employment, multiple jobs, seasonal, employment insurance, social assistance, other benefits, no reliable source of income and unknown income source. Caregiver sources of income were combined to reflect the primary income source for the household.
Number of moves	Two dichotomous variables One move (1) No moves or two or more moves (0); Two or more moves (1) One move or no moves (0)	Number of moves reflects the number of moves the household had experienced in the past 12 months.

Table 1 (*Continued*)

| Outcome variable	Measurement	Description
Household level of cooperation	Dichotomous variable Cooperative (1) Not cooperative (0)	Household level of cooperation reflects 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.
Aboriginal status of child	Dichotomous variable Aboriginal (First Nations Status, First Nations non status, Métis, Inuit or other) (1) Not Aboriginal (0)	Worker indicated if the child was not Aboriginal, First Nations status, First Nations non status, Métis, Inuit or other Aboriginal.
Level 2 variables		
Worker position	Majority of investigations in the sample conducted by intake workers (51%) (1); Majority of investigations in the sample were conducted by other than intake workers (0)	Worker position refers to a worker who performs only an intake function; other workers perform investigation functions in addition to ongoing family and/or child cases or other responsibilities.
Location of organization	Investigations from Metropolitan agencies (1) Mixed urban rural and rural agencies (0)	Location of the organization responsible for conducting the investigation.
Staffing vacancies	Investigations with no unfilled staffing positions (1) Unfilled staffing positions (0)	Agencies reported whether there were any unfilled staffing positions.
Proportion of Aboriginal reports	Agencies with 45% or more investigations involving Aboriginal caregivers (1) Agencies with less than 20% of investigations involving Aboriginal caregivers (0)	The number of investigations involving Aboriginal children from each agency was determined. The choice of cut off point for *proportion of Aboriginal reports* was arrived in the following manner. Ten individual models were fitted for the 1998 and 2003 datasets, with *Aboriginal status* as the only first level variable, and 10 different *proportion of Aboriginal reports* (*PAM*), from 10% (PAM10) to 100% (PAM100), as sole second level variable. Fig. 2 displays regression parameters for *Aboriginal status* and *proportion of Aboriginal reports*; by inspection of the figure, PAM45 appears as optimal value for both the 1998 and 2003 cycles.
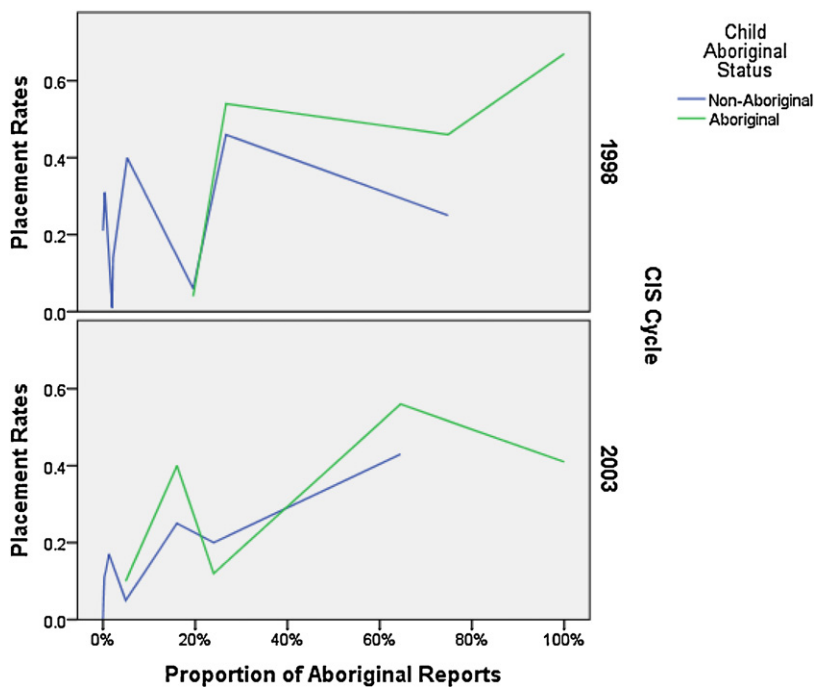
Fig. 2. Placement rates for paired sites by proportion of Aboriginal investigations by Aboriginal status of the child.

agencies that were sampled in both 1998 and 2003 (Fig. 2 depicts these relationships). The term "proportion of Aboriginal reports" refers to the proportion of investigations at an agency involving Aboriginal children. Although the 1998 data shows greater variability in placement rates (most likely due to a smaller sample size); there are no major inconsistencies, providing some basis for the assertion that the 1998 and 2003 samples can be fruitfully compared through models developed for the *CIS-1998* data. Descriptive statistics are shown for all level one and level two variables (Table 2).

Construction of the 2003 regression models went as follows. First, a model including all first-level variables was fitted (Table 3). From this model, predictors without a statistically significant relationship ($p < .05$) to the decision to place a child were dropped. The model was then run with this smaller set of predictors, and again only significant predictors ($p < .05$) were retained. This last set of independent variables leads to a model where all regression coefficients were significantly different from zero ($p < .01$) (Table 4). A multilevel model was then fitted with the previously retained first-level variables, adding four agency indicators. These second-level variables were also available for the 1998 CIS data analysis (Fluke et al., 2010). Extracting agency-level variables without a significant relationship, using a critical value of $p = .05$, we arrived at our final model (Table 5), where all relationships are statistically significant ($p < .01$).

For this analysis, a binary proportion of Aboriginal reports variable that would be maximally adequate for both the 1998 and 2003 cycles was chosen in order to facilitate the comparison. Results from ten runs of a simple multilevel model including only Aboriginal status at the first level and increasing proportion of Aboriginal reports as binary variables are presented in Fig. 3, from which a value of 45% or more Aboriginal reports was selected as optimal for both samples. Table 6 presents the 1998 data rerun with the 45% cut point for Aboriginal reports and Table 7 is included from the original paper for reference. The cut point used for Aboriginal reports in the original paper was 20%.

Results

Characteristics of first level variables

Twenty-two percent of investigations opened for ongoing child welfare services resulted in an out-of-home placement (Table 1). Twenty-three percent of investigations were physical abuse investigations; less than 1% of children were the focus of a sexual abuse investigation; 52% were neglect investigations, and in 23% of investigations the worker's primary concern was emotional maltreatment. Fourteen percent of the sample had been physically harmed, and in slightly more than one third of the sample emotional harm was evident. In over half of the investigations, the worker noted at least two concerns for the child.

Thirty-nine percent of households in the sample had moved at least once in the past 12 months, and 49% of caregivers in the sample were either on social assistance or other income maintenance benefits or were employed only part-time. In

Table 2
Characteristics of investigations involving children receiving services ($n = 2061$).

Variable	N	%
Dependent variable: placement indicated	444	21.5
Independent variables:		
Child and family characteristics – level one (report child pair)		
Child age (6 or over)	1339	65.0
Type of maltreatment (presence of type)		
Physical abuse	472	22.9
Sexual abuse	52	.03
Neglect	1064	51.6
Emotional maltreatment	473	23.0
Physical harm (present)	287	13.9
Mental or emotional harm (present)	712	34.7
Child functioning		
Presence of one concern	300	14.6
Presence of two or more concerns	1103	53.5
Previous case opening (present)	1543	76.4
Caregiver functioning		
Presence of one concern	231	11.2
Presence of two concerns	298	14.5
Presence of three or more concerns	1380	67.0
Income source		
Part time employment only	268	13.8
Social assistance only	677	34.9
Number of moves		
One move	336	16.3
Two or more moves	371	22.4
Cooperation (present)	1713	84.4
Child ethnicity (aboriginal)	536	26.2
Organizational characteristics – level two (local CPS agency)		
Worker position (majority are specialist intake workers)	1251	60.7
Location of organization (metropolitan agency)	1179	57.2
Staff vacancies (vacant positions)	935	50.9
Aboriginal investigations (45% or more of investigations are aboriginal caregivers)	915	44.4

93% of investigations, workers noted at least one caregiver functioning concern and in 67% of investigations, workers noted three or more concerns. In 26% of investigations, the caregiver or the child was of Aboriginal heritage.

Second level variables

Fifty-one percent of investigations originated from an agency with unfilled staffing positions and 61% of investigations were conducted by workers with an investigation specialist or intake designation. Fifty-seven percent of organizations were located in a metropolitan area. Forty-four percent of investigations were conducted in agencies that had more than 45% children of Aboriginal origin reported for maltreatment-related concerns.

Table 3
Model A (level one only) – CIS 2003.

|	Estimate	S.E.	Est./S.E.	*p*-value	Odds ratio	95% Confidence interval	
Physical abuse	−.576	.406	−1.419	.156	.56	.25	1.25
Neglect	−.169	.383	−.440	.660	.84	.40	1.79
Emotional maltreatment	−.587	.404	−1.452	.147	.56	.25	1.23
Physical harm (present)	.599	.197	3.037	.002	1.82	1.24	2.68
Mental or emotional harm (present)	.721	.164	4.394	.000	2.06	1.49	2.84
Presence of one child functioning concern	−.089	.243	−.365	.715	.91	.57	1.47
Presence of two or more child functioning concerns	.086	.194	.444	.657	1.09	.75	1.59
Previous case opening (present)	.289	.186	1.550	.121	1.34	.93	1.92
One move in past 12 months	.328	.173	1.900	.057	1.39	.99	1.95
Two or more moves in past 12 months	.087	.178	.491	.624	1.09	.77	1.55
Part time employment	.241	.205	1.174	.240	1.27	.85	1.90
Benefits	.085	.166	.509	.611	1.09	.79	1.51
Presence of one caregiver concern	−.352	.347	−1.017	.309	.70	.36	1.39
Presence of two caregiver concerns	−.757	.339	−2.232	.026	.47	.24	.91
Presence of three or more caregiver concerns	−.616	.296	−2.081	.037	.54	.30	.96
Household level of cooperation present	−.708	.176	−4.024	.000	.49	.35	.70
Aboriginal status of child	.767	.154	4.991	.000	2.15	1.59	2.91
Child age (6 or over)	−.206	.165	−1.250	.211	.81	.59	1.12

Table 4
Model B (parsimonious level one and full level two) – CIS 2003.

	Estimate	S.E.	Est./S.E.	p-value	Odds ratio	95% Confidence interval	
Physical harm (present)	.657	.169	3.895	.000	1.93	1.39	2.69
Mental or emotional harm (present)	.382	.131	2.927	.003	1.47	1.13	1.89
Household level of cooperation (present)	−.978	.152	−6.422	.000	.38	.28	.51
Aboriginal status of child	.645	.161	3.996	.000	1.91	1.39	2.61
Level 2							
Staff vacancies (vacant positions)	.071	.271	.263	.793	1.07	.63	1.83
Worker position (majority are specialist intake workers)	.466	.276	1.692	.091	1.59	.93	2.74
Aboriginal investigations (45% or more of investigations are aboriginal caregivers)	.735	.300	2.453	.014	2.09	1.16	3.75
Location of organization (metropolitan agency)	.172	.269	.637	.524	1.19	.70	2.01

Table 5
Model C (parsimonious level one and parsimonious level two) – CIS 2003.

	Estimate	S.E.	Est./S.E.	p-value	Odds ratio	95% Confidence interval	
Physical harm (present)	.703	.158	4.458	.000	2.02	1.48	2.75
Mental or emotional harm (present)	.422	.124	3.396	.001	1.53	1.20	1.94
Household level of cooperation (present)	−.898	.148	−6.064	.000	.41	.30	.54
Aboriginal status of child	.623	.160	3.887	.000	1.86	1.36	2.55
Level 2							
Aboriginal investigations (45% or more of investigations are Aboriginal caregivers)	.795	.301	2.641	.008	2.21	1.23	3.99
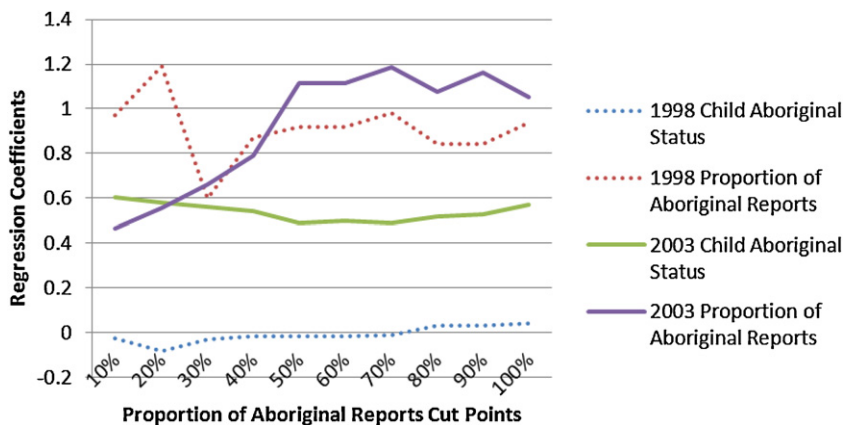
Fig. 3. Regression models of child Aboriginal status and proportion of Aboriginal reports by proportion of aboriginal reports cut points (CIS-1998 and CIS-2003).

Table 6
Model C1 (parsimonious level one and parsimonious level two) – CIS 1998.

	Estimate	S.E.	Est./S.E.	p-value	Odds ratio	95% Confidence interval	
Neglect	.720	.174	4.139	.000	2.05	1.46	2.89
Physical harm (present)	.619	.208	2.977	.003	1.86	1.24	2.79
Mental or emotional harm (present)	1.144	.174	6.574	.000	3.14	2.23	4.42
Two or more moves in past 12 months	1.283	.244	5.260	.000	3.61	2.24	5.82
Level 2							
Aboriginal investigations (45% or more of investigations are aboriginal caregivers)	1.166	.336	3.465	.001	3.21	1.66	6.20

Table 7
Model C2 (parsimonious level one and parsimonious level two) – original CIS 1998 model.

	Estimate	S.E.	Est./S.E.	*p*-value	Odds ratio	95% Confidence interval	
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
Two or more moves in past 12 months	1.067	.246	4.329	.000	2.907	1.795	4.708
Presence of three or more caregiver concerns	.900	.174	5.174	.000	2.46	1.749	3.459
Household level of cooperation (present)	−.580	.232	−2.499	.012	.56	.355	.882
Level 2							
Aboriginal investigations (20% or more of investigations are Aboriginal caregivers)	1.124	.328	3.425	.001	3.077	1.618	5.853

The statistically significant first level variables were emotional harm, physical harm, household level of cooperation, the presence of two or more caregiver concerns and the presence of three of more caregiver concerns and the Aboriginal status of the child (Table 3). When combined with level two variables, the final retained first-level predictors were physical harm, emotional harm, caregiver cooperation, Aboriginal status, all at *p* < .01 level of significance (Table 4).

Table 5 represents the final 2003 model. Only significant level one and level two variables were retained. The proportion of Aboriginal reports at the agency level remains a significant factor, almost identical to its counterpart in 1998, with a slightly tighter confidence interval. The final model was run on 100 random subsamples half the size of the 2003 dataset, producing an average regression coefficient estimate of 1.09 with a standard error of .02, indicative of strong stability of the effect of the proportion of Aboriginal reports, making notable overfitting implausible.

Physical harm is also present in the new final model for the 1998 data (Table 6), and its regression parameter's estimate (.619) is very similar to what we find in 2003. Emotional harm has a similar effect in both cycles, though attenuated in 2003.

Discussion

This is the second study to examine the overrepresentation of Aboriginal children in Canada placed in out-of-home care while controlling for individual and organizational variables. The current multi-level analysis attempts to replicate the findings from CIS-1998 using CIS-2003 data, and rerunning the 1998 analysis in order to directly compare the findings.

In the multi-level study using the CIS-2003 data, findings suggested that both physical and emotional harm variables at the individual level contributed to increased likelihood of placement. Unlike the CIS-1998 analysis, the Aboriginal status of the child contributed to the placement decision. Somewhat counter intuitively, when caregiver concerns were present using an index variable, there was a decreased likelihood of placement. Caregivers' cooperation with the investigation also decreased the likelihood of placement. Among several candidate variables at the organizational level, only one significantly contributed to the model, namely agencies with more than 45% Aboriginal children as a proportion of their investigations.

There were similarities and differences in the findings of this replication study and the original analysis conducted with CIS-2003 data. At the individual level, emotional and physical harm were significantly associated with placement both in 1998 (Fluke et al., 2010) and the present analysis, reflecting the importance of case factors in the decision making ecology. This is consistent with the results of other CIS analysis and the findings of other studies (Black et al., 2008; Tonmyr, Williams, Jack, & MacMillan, 2011; Trocmé et al., 2008). The child's Aboriginal ethnicity was significantly related to placement in the current replication study using 2003 data but not using 1998 data. This could possibly be related to the increase in the number of Aboriginal agencies participating in the 2003 study, from three in 1998 to eight in 2003, thus augmenting the sample of Aboriginal children and the potential of detecting significant findings. As the sample of Aboriginal children in the CIS-2003 study is larger than the sample in CIS-1998, there is more power to detect racial bias and therefore the influence of racial bias at the individual level cannot be excluded as a factor in placement decisions. Understanding this finding remains a central question in Canadian child welfare services given the overrepresentation of Aboriginal children in the child welfare system at each point in the service continuum (Sinha et al., 2011). There are markedly few studies that explore this relationship.

At the organizational level, reflecting the decision making ecology, the proportion of Aboriginal children investigated by the agency as a percentage of all clients was statistically significant in both analyses. Proportion of Aboriginal families served may be seen as an indicator of poverty at the community level where the agency is situated. This may demonstrate that practice or resources are different in these agencies. This analysis does not include important contextual variables such as colonization and racism which may also impact the decision to place a child (Blackstock, 2009).

In interpreting these findings, the following CIS-specific and analytical decisions from the original analysis need to be kept in mind. There have been some changes between cycles. One difference is that for 2003 the child's Aboriginal status in addition to the caregiver's ethnicity was defined. The analysis was limited by the availability of variables, most notably by the lack of robust family level poverty variables and at the worker level; stress, organizational support, burnout, casework skills, and workload. Family income data would have been useful to include as measures of poverty since it is known that

Aboriginal people are more likely to be poor and to experience deeper levels of poverty as compared to the rest of the Canadian population (Auditor General of Canada, 2008; Blackstock, 2005). Some visible minorities were included in the same category as White families. However, other CIS (1998 and 2003) analyses have shown that visible minorities, Aboriginal and White people differ on many characteristics (Blackstock, Trocmé, & Bennett, 2004; Lavergne, Dufour, Trocmé, & Larrivée, 2008). Complex multi-level models optimally use dichotomous variables (Muthén & Muthén, 1998–2007), thus it is possible that the non-significant result for age is related to the dichotomization of age. Although caregiver concerns has shown to be a useful index in previous CIS analysis (e.g., Trocmé, Knoke, Fallon, & MacLaurin, 2009; Wekerle, Wall, Leung, & Trocmé, 2007; Williams, Tonmyr, Jack, Fallon, & MacMillan, 2011) it was not statistically significant in our analysis. It is possible that certain caregiver variables in Aboriginal families are more important than in non Aboriginal families, and that results might be different if the caregiver variables were analyzed separately. This was constrained by the requirement for compatibility with the 1998 analysis. Data from Aboriginal families in the Australia, Canada and the USA have shown poverty, substance misuse and mental health problems influence placement decisions (Blackstock & Trocmé, 2005; Carter, 2010; Zhou & Chilvers, 2008). However, in the CIS it is impossible to know if these problems exist to a higher degree in Aboriginal families, since the study presented the child protection worker's perception, and the measure is not independently validated.

Strength and limitations

The CIS is an excellent source of information for this type of analysis, since it reflects data on placement decision from the responsible worker and it captures data on children at the initial investigation stage. However, limitations of this study should be considered, since we did not control for the non-independence of siblings in the sample, and the data are cross sectional.

The presence of concerns regarding child functioning was related to an increased likelihood of placement, but these findings were not statistically significant. It is possible that the child functioning variables were not statistically significant since not all child functioning concerns were applicable to all ages. For instance, infants do not have irregular school attendance or criminal behavior. We chose to capture only the primary form of child maltreatment, which represents the child protection workers' overriding concerns. However, co-occurrence of different types of maltreatment may also increase the likelihood of placement.

Limitations of CIS dataset/differences between 1998 and 2003

There are limitations in the design of the CIS-2003. 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 thirty 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. The non-Aboriginal group includes children that may be ethnic and racially diverse (approximately 10% of sample is not white or Aboriginal). 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. These findings cannot be generalized to Québec as data from this province were not included in the analyses.

The primary objective of the CIS-2003 was to provide a reliable estimate of the incidence of child maltreatment in Canada. Although information was collected about workers and agencies, these variables were collected to provide context with respect to the primary objective. Thus, key concepts in the literature related to human resources, such as worker stress, worker burnout, and levels of social support were not measured. These factors are theorized in the literature as having influence in the delivery of child welfare services. The study was not designed to collect precise organizational measures and therefore the proportion of Aboriginal reports is likely a proxy for a number of constructs including a lack of services and resources. More research is needed to develop more precise organizational measures that are able to deconstruct this contribution. Similarly, the measure used to assess organizational culture was the rating assigned to the agency by the research assistant responsible for data collection. It did not reflect an internal rating of organizational culture and therefore may be inadequate.

Implications

There is clear evidence that both case and organizational level factors influence the placement decision as described in the decision making ecology. Aboriginal children are overrepresented in the Canadian child welfare system. The results of this study, in contrast to the 1998 model, finds that whether or not the child is Aboriginal is a predictor of placement, however, the results of this study do not prove that this is related to differential decision making. Consistent with the CIS-1998 analysis, greater levels of Aboriginal families in the investigation caseloads were associated with an increased likelihood of placement in the presence of other variables in the context of a multi-variate, and multi-level analysis. For the current

study, the analysis leads us to reject the hypothesis that agencies with greater Aboriginal caseloads are not associated with increased odds of placement. As noted for CIS-1998 data one possible explanation is that there are discrepancies in resources provided to Aboriginal agencies, and there is less voluntary sector support (Auditor General of Canada, 2008; Blackstock, 2005). Further analysis needs to be conducted to further understand individual and organizational level variables that may influence decisions regarding placement of Aboriginal children. There is also a need for research that is sensitive to differences among, and between, Métis, First Nations and Inuit communities. Not only has the legacy of colonialism left Aboriginal peoples disproportionately ranked among the poorest of Canadians, a marked difference in the level of income inequality persists (Wilson & Macdonald, 2010). 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) and remedying outstanding inequities in child welfare resources (Auditor General of Canada, 2008, 2011; Standing Committee on Public Accounts, 2009).

Conflict of interest

Acknowledgments

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