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Differentiating Between Substantiated, Suspected, and Unsubstantiated Maltreatment in Canada

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The decision to substantiate is a key factor in determining eligibility for services and decisions to press criminal charges or to remove a child, and it is frequently the basis for selecting samples of maltreated children or to measure recidivism or intervention effectiveness. Although there is a growing body of research on case substantiation in the United States, few studies have examined this decision in other jurisdictions. Using data from the 2003 Canadian Incidence Study of Reported Child Abuse and Neglect, this study examines the profiles of a national sample of 10,010 investigations. Multivariate analyses reveal that substantiation decisions are generally made in a fashion that is relatively consistent with the clinical characteristics of cases. Along with severity of harm, parent risk factors, and housing risk factors, police referrals are among the most important predictors of case substantiation. Cases involving multiple forms of maltreatment are also more likely to be substantiated.

Keywords: *investigation; substantiation; child maltreatment*

The decision to substantiate child maltreatment is a complex judgment including the consideration of physical evidence, credibility of witnesses, determination of intentionality, consideration of community standards, and interpretation of statutes. In most Canadian jurisdictions and many jurisdictions in the United States, the decision to substantiate maltreatment is further complicated by statutes and investigatory guidelines that include situations where children have not yet been harmed but are at substantial risk of harm. Elucidating the factors that influence substantiation decisions is important for two primary reasons. First, in some jurisdictions the decision to substantiate maltreatment may determine eligibility for child protective services. The decision to substantiate maltreatment can also set into motion a series of decisions that have a significant impact on children and their families, such as the decision to press criminal charges or to remove a child from the family home. Second, substantiation status is frequently

used as an index of maltreatment in research, as the basis for defining samples of maltreated children, or to measure recidivism or intervention effectiveness (English, Bangdiwala, & Runyan, 2005; Leiter, Myers, & Zingraff, 1994). Prior substantiation status is often the only index of maltreatment history, although definitions of maltreatment and evidentiary standards vary across jurisdictions (Slep & Heyman, 2006). Thus, substantiation standards determine estimates of rates of maltreatment and shape research findings.

According to the 2003 Canadian Incidence Study of Reported Child Abuse and Neglect (CIS-2003) (Trocmé et al., 2005), nearly half (49%) of all child maltreatment investigations conducted in Canada, outside of Quebec, were substantiated, with maltreatment remaining suspected

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in another 12.7% of cases, close to double the rate of substantiation reported in the United States (U.S. Department of Health and Human Services—Administration on Children, 2006). Although there is a growing body of research examining maltreatment substantiation in the United States, this work has not extended to jurisdictions in other countries. This study examines factors associated with different levels of substantiation in a national sample of child maltreatment investigations conducted in Canada.

Literature Review

Studies examining the relationship between maltreatment substantiation and the information considered by investigating workers generally find that substantiation decisions are driven by clinical considerations. Information collected to establish the occurrence and severity of maltreatment, number of maltreatment incidents, and presence of injuries is significantly associated with substantiation decisions at the bivariate and multivariate level (Haskett, Wayland, Hutcheson, & Tavana, 1991; Winefield & Bradley, 1992). For example, in one of the most comprehensive studies examining the type of evidence considered in child maltreatment investigations, Scannapieco and Connell-Carrick (2005) found that chronicity of maltreatment, prior maltreatment, and presence of injuries significantly increased the odds of substantiation, with 85% to 88% of cases being substantiated in cases rated extreme in terms of chronicity or severity. Substantiation is also more likely in cases involving older children, presumably because it is easier to interview and interpret information from older children (Haskett et al., 1991).

Beyond considerations regarding the sufficiency of evidence to conclude that the incident under investigation occurred, it is clear that substantiation decisions are also driven by clinical considerations used to determine the risk of maltreatment. Clinical characteristics, in particular characteristics associated with parenting ability and stress, stand out in most studies as among the strongest predictors of substantiation (English, Marshall, Coghlan, Brummel, & Orme, 2002). Scannapieco and Connell-Carrick (2005) found that poor parental skill, inability to effectively communicate, lack of impulse control, use of harsh discipline, history of maltreatment within the family, and recent incidents of violence were strongly associated with substantiation of child maltreatment. Parent substance abuse has also been identified as one of the strongest predictors of substantiation (English et al., 2002; Trocmé, Tam, & McPhee, 1995).

Although cross-sectional studies relying primarily on information gathered by the investigating worker suggest

that substantiation decisions are appropriately driven by the investigator's assessment of the evidence and related risk factors, concerns about the arbitrariness of case substantiation decisions have arisen because substantiation rates in many jurisdictions appear to be higher for visible minorities (Ards et al., 2003) and for reports made by professionals, in particular by police (Eckenrode, Powers, Doris, Munsch, & Bolger, 1988; English et al., 2002; Kesner & Robinson, 2002). However, once one controls for demographic characteristics and for type and severity of maltreatment, the effect of the extraneous factors is generally not as pronounced (Levine, Doueck, Freeman, & Compaan, 1996). For example, analysis of substantiation decisions made in cases involving Aboriginal and non-Aboriginal children in the 1998 Canadian Incidence Study of Reported Child Abuse and Neglect (Trocmé et al., 2001) found that although cases involving Aboriginal children were 1.5 times more likely to be substantiated than were cases involving non-Aboriginal children, once one controlled for differences in case characteristics, there was no difference in the likelihood of substantiation (Trocmé, Knoke, & Blackstock, 2004). Using administrative data for Minnesota, Ards et al. (2003) found that racial disproportionality was artificially inflated by aggregating counties with large and small African American populations.

Several studies have examined the relationship between substantiation status and child outcomes. These studies test the assertion that substantiation status is a valid proxy measure for maltreatment, with the expectation of greater impact on child functioning. In a retrospective study of 15,812 juvenile court records in North Dakota, Thompson et al. (2001) found that having a case recorded as unsubstantiated lowered a youth's odds of subsequent offending by 55% relative to being abused. However, other longitudinal studies raise questions about the predictive validity of substantiation decisions. Concern about the distinction between substantiated and unsubstantiated maltreatment arose following a file study of reports to child protection authorities in North Carolina that found no significant differences in school outcomes and delinquency outcomes between substantiated and unsubstantiated cases (Leiter et al., 1994). Similarly, studies examining subsequent child protection involvement found little difference in re-referral rates (English, Marshall, Brummel, & Orme, 1999) and subsequent substantiation of maltreatment (Drake, Jonson-Reid, Way, & Chung, 2003), suggesting that substantiated cases were not more severe than unsubstantiated cases in terms of the likelihood of future child protective services involvement. Using results from the Longitudinal Studies of Child Abuse and Neglect (LONGSCAN) project, Hussey et al. (2005) found no significant differences in

behavioral and developmental outcomes for children with substantiated or unsubstantiated maltreatment. Concern about the unreliability of substantiation judgments (Slep & Heyman, 2006) and the subjective nature of this decision has led some critics to argue for more narrow standards for intervention (Besharov & Laumann, 1996).

Drake's (1996) harm/evidence model provides a two-dimensional framework for understanding the factors that influence the level of substantiation assigned. In brief, the model proposes that substantiated cases tend to have strong evidence that the maltreatment occurred and involve demonstrable harm or evidence of significant risk of harm. Unsubstantiated cases, on the other hand, may include cases involving harm but inconclusive evidence (e.g., cause of injury remains undetermined), or they may involve strong evidence that an act occurred but insufficient harm to classify the behavior as "maltreatment." In the latter cases, harm may not be sufficient to meet the policy or legal standard of maltreatment (e.g., in cases of corporal punishment). When applied to a three-tier classification system, the third "suspected" or "indicated" category includes cases in which there may be harm and the worker believes that maltreatment occurred, but available evidence is not sufficient to corroborate this suspicion. Erroneous or invalid reports compose a small portion of the unsubstantiated cases in the model and represent cases with little evidence of maltreatment or harm.

Following a review of research on the quality and accuracy of sexual abuse investigations, Herman (2005) concludes that accuracy of decisions would be improved if investigators were not required to make a forced choice between substantiated and unsubstantiated maltreatment. Many jurisdictions use a three-level classification system, including a third suspected or indicated category to include cases where maltreatment cannot be confirmed but remains suspected. Among jurisdictions that use a three-level system, rates of suspected maltreatment of between 5% and 15% are reported (U.S. Department of Health and Human Services—Administration on Children, 2005). Although some research suggests that the inclusion of a third category more accurately reflects workers' judgments (e.g., Herman, 2005; Zuravin, Orme, & Hegar, 1994), most studies simply combine suspected and substantiated cases (see, e.g., Sabol, Coulton, & Palousky, 2004; Sedlak & Broadhurst, 1996) or conversely combine suspected and unsubstantiated maltreatment (Trocmé et al., 1995). Little attention has been paid to assessing the extent to which suspected maltreatment differs from the other categories of substantiation, but two studies suggest that suspected cases may not be entirely distinct from the other categories. Using data from the third wave

of the National Incidence Study, King, Trocmé, and Thatte (2003) found that income, ethnic origin, prior abuse, and presence of an injury predicted substantiated versus indicated cases. However, the overall predictive model was limited. In addition, using risk factor ratings, English et al. (2002) were able to develop good predictive models for substantiated and unsubstantiated maltreatment but were less successful in predicting the inconclusive cases.

The CIS-2003 (Trocmé et al., 2005) provides an ideal data set to examine the distinction between levels of maltreatment because of its relatively large sample size; the broad array of child-, family-, and maltreatment-related information that it tracked, and its use of a three-tier substantiation classification (unsubstantiated, suspected, and substantiated). This article compares the profiles of substantiated, suspected, and unsubstantiated cases in the CIS-2003 to examine four questions:

1. To what extent can cases of suspected maltreatment be combined with unsubstantiated or substantiated cases?
2. Can substantiated cases be accurately differentiated from unsubstantiated cases?
3. If so, what factors differentiate substantiated and unsubstantiated cases? Drake's (1996) model suggests that substantiated cases should be more likely than unsubstantiated cases to have harm or significant risk of harm in addition to solid evidence that maltreatment occurred (e.g., histories of maltreatment).
4. Do different sets of factors drive the substantiation decision in cases of physical abuse, neglect, emotional maltreatment, and in those involving multiple forms of maltreatment?

Method

The CIS-2003 (Trocmé et al., 2005) is the third child abuse and neglect incidence study to be conducted in Canada. The CIS-2003 tracked a sample of 14,200 child maltreatment investigations conducted during the fall of 2003 in 63 of 400 child welfare sites across Canada. Because of the large amount of missing data in the Québec portion of the study, this analysis examines the core sample of 11,562 investigations involving children under the age of 16 investigated outside of Québec. Information about the alleged maltreatment, the children, their families, and the results of the investigations was obtained directly from investigating workers using a three-page Maltreatment Assessment Form.

In interpreting the results of the study, several limitations of the design should be noted. The data collected are limited to information that workers gathered during their standard investigation; no additional instruments were used to collect information from children or families. The

Table 1
Form of Maltreatment by Substantiation Status

Form of Maltreatment Investigated	Unfounded		Suspected		Substantiated		Total	
	%	N	%	N	%	N	%	N
Only physical abuse	51.0	1,097	11.8	253	37.2	801	100	2,151
Only sexual abuse	67.1	357	12.6	67	20.3	108	100	532
Only neglect	49.2	1,533	11.0	342	39.8	1,238	100	3,113
Only emotional maltreatment	39.7	425	16.4	176	43.9	470	100	1,071
Only exposure to domestic violence	15.1	234	9.0	140	75.9	1,178	100	1,552
Multiple forms	25.0	785	15.7	493	59.3	1,865	100	3,143
Total	38.3	4,431	12.7	1,471	49.0	5,660	100	11,562

Source: Trocmé et al. (2005).

Note: N = 11,562.

study only examined cases that were open for investigation by a child welfare authority and did not track screened-out reports or internal reports on already open cases or sexual abuse cases investigated by the police only. Finally, the study sample is only designed to be nationally representative when the study weights are applied. Because the weights were not applied for the analyses in this article, results must not be interpreted as necessarily being nationally representative.

Analysis

To examine the factors associated with the substantiation of maltreatment investigations, bivariate and multivariate analyses were conducted. Preliminary analyses were conducted on the core CIS-2003 sample of 11,562 investigations. However, the 1,552 cases involving exposure to domestic violence as the only form of maltreatment were dropped from subsequent analyses because the substantiation rate in exposure to domestic violence cases (75.9%, Table 1) was considerably higher than the rate for other forms of maltreatment (44.7%). The substantiation process in domestic violence cases may focus more on establishing the occurrence of domestic violence rather than child maltreatment due to exposure per se.

Chi-square bivariate analyses were used to examine the relationship between case characteristics and whether the investigation was classified by the worker as unsubstantiated, suspected, or substantiated. Multinomial regression was conducted to determine whether investigations that were substantiated and unsubstantiated could be differentiated from investigations involving suspected maltreatment. Subsequent logistic regression analyses examine specifically the factors that differentiate substantiated from unsubstantiated maltreatment. Additional logistic regression analyses were conducted to examine whether forms of

maltreatment differ in the sets of factors that influence the decision to substantiate.

Independent Variables

The set of CIS-2003 variables included in the analyses represents a range of household, caregiver, and child-level factors that may influence the probability that a maltreatment investigation is substantiated.

Forms of maltreatment. The primary type of investigated maltreatment and up to two secondary types were coded using 22 forms of maltreatment. These were grouped for these analyses into six categories: physical abuse only, neglect only, sexual abuse only, emotional maltreatment only, exposure to domestic violence only, and multiple forms of maltreatment. Because the substantiation process is very different in exposure to domestic violence cases, with the exception of Table 1, cases involving only exposure to domestic violence were excluded from the analyses.

Substantiation status. Each of up to three forms of maltreatment was classified by the worker as unfounded, suspected, or substantiated. Workers were instructed to indicate that maltreatment was substantiated if the balance of evidence indicated that it occurred. Maltreatment was classified as suspected if the evidence was insufficient for the worker to substantiate but the occurrence of maltreatment could not be ruled out. Unfounded was selected when the balance of evidence indicated that maltreatment had not occurred. If the primary or a secondary form of maltreatment was substantiated, the case was considered substantiated. Because the term *unfounded* is used in the CIS in the same sense as *unsubstantiated*, we use the more commonly used term *unsubstantiated* in this article.

Source of referral: A list of 19 possible sources of referral was collapsed into six categories: nonprofessional referrals (parent, child, friend, neighbor, relative), school, other professional referral source (physician, public health nurse, hospital, mental health, social assistance worker, crisis service/shelter, community/recreation center, day care, community agency, other child welfare service), police referral, anonymous, or other referral.

Housing risk: Housing risk was derived from four variables. Each of the following characteristics was given a score of one: Family residing in a shelter, public housing, or other housing; unsafe housing; overcrowded home; and two or more moves in the 12 months prior to the investigation. Scores were collapsed into no housing risk, one risk, or two or more housing risks.

Caregiver ethno-racial status. Ethno-racial status of the primary caregiver (listed as Caregiver A on the CIS Maltreatment Assessment Form) was used in the present analyses. Eight ethno-racial categories were collapsed into: White, Aboriginal, and "Other" minority.

Caregiver risk factors. Workers indicated whether each of nine primary caregiver risk factors were present at the time of investigation: Alcohol abuse, drug abuse, criminal activity, cognitive impairment, mental health concerns, physical health concerns, few social supports, domestic violence, and caregiver maltreated as child. A risk factor was considered present if the worker indicated that it was suspected or confirmed. The number of risk factors noted was summed for the primary caregiver. Because the distribution of risk factors was positively skewed, the number of risk factors was collapsed into four categories: none, one, two, and three or more risk factors.

Caregiver cooperation with the investigation. For each caregiver, workers indicated whether contact with the caregiver in response to investigation was cooperative. Responses for caregivers were collapsed into one or both caregivers were uncooperative, or caregivers were cooperative.

Maltreatment history. Refers to whether previous maltreatment was substantiated for the investigated child.

Child functioning concerns. Three domains of child functioning were derived for these analyses in cases where a concern was suspected or confirmed: (a) cognitive/physical health (developmental delay, physical disability, learning disability, substance-abuse-related birth defect, other health condition, specialized education services, and positive toxicology at birth); (b) child mental/emotional health (depression or anxiety, self-harming behavior, and

psychiatric disorder); and (c) behavioral concerns (negative peer involvement, attention deficit disorder with or without hyperactivity, drug/solvent abuse, violence toward others, running away, irregular school attendance, inappropriate sexual behavior, youth Criminal Justice Act involvement, and other behavioral or emotional problems).

Physical or emotional harm. Workers indicated whether either physical or emotional harm was noted as caused by substantiated maltreatment.

Findings

Rates of Substantiation

Table 1 presents the rates of substantiation by form of maltreatment. Rates of substantiation vary from a low of 20% for child sexual abuse to a high of 76% in cases of exposure to domestic violence. Physical abuse, neglect, and emotional maltreatment were substantiated at similar rates of 37%, 40%, and 44%, respectively. Rates of substantiation were significantly higher in cases involving multiple forms of maltreatment (59%). Overall, in 13% of investigations, it was not possible to determine whether or not maltreatment had occurred. The rate of suspected maltreatment was fairly consistent across most forms of maltreatment, with rates being slightly higher in cases involving emotional maltreatment or multiple forms of maltreatment. Cases were less likely to be classified as unsubstantiated if the investigated maltreatment involved exposure to domestic violence only or multiple forms of maltreatment. Only one in six cases investigated for exposure to domestic violence only was classified by the worker as unsubstantiated. One in four investigations involving more than one form of maltreatment was considered unsubstantiated.

Bivariate Analyses

Table 2 presents bivariate relationships between substantiation status and a variety of case characteristics in the sample of 10,010 children, excluding children with only exposure to domestic violence.

Multinomial Regression

The results of the multinomial regression analysis are presented in Table 3. The table summarizes the effect of each case characteristic on the odds of being suspected rather than unsubstantiated or substantiated rather than suspected, controlling for the effect of the other characteristics in the model.

Table 2
Level of Substantiation by Case Characteristics

CIS-2003 Variables	Unsubstantiated		Suspected		Substantiated		Total	
Referral source***								
Any nonprofessional referral	46%	1,213	14%	377	40%	1,045	100%	2,635
Police referral	23%	313	11%	150	66%	917	100%	1,380
School	46%	1,232	13%	346	41%	1,086	100%	2,664
Other professional referral	39%	926	14%	335	46%	1,089	100%	2,350
Anonymous	64%	308	10%	46	26%	124	100%	478
Other referral source	41%	194	16%	75	44%	208	100%	477
Housing risk***								
None	47%	3,235	13%	881	40%	2,778	100%	6,894
One	36%	859	13%	322	51%	1,213	100%	2,394
Two or more	14%	103	18%	128	68%	491	100%	722
Family structure**								
Two-parent biological	44%	1,388	12%	374	44%	1,402	100%	3,164
Two-parent blended/partner	43%	871	14%	288	43%	881	100%	2,040
Single parent	40%	1,668	14%	585	46%	1,924	100%	4,177
Other	43%	270	13%	84	44%	275	100%	629
Ethno-racial status***								
White	45%	3,117	13%	895	43%	2,991	100%	7,003
Aboriginal	32%	512	15%	246	53%	859	100%	1,617
Other minority	42%	371	14%	144	46%	418	101%	1,365
No. primary caregiver risk factors***								
None	62%	2,140	10%	325	28%	968	100%	3,433
One	42%	879	14%	301	44%	913	100%	2,093
Two	38%	577	15%	223	47%	712	100%	1,512
Three or more	20%	601	16%	482	64%	1,889	100%	2,972
One/both caregivers uncooperative***	23%	279	16%	191	61%	752	100%	1,222
Prior substantiated maltreatment***	29%	809	13%	361	58%	1,593	100%	2,763
Signs of emotional harm***	11%	165	16%	241	73%	1,126	100%	1,532
Any physical harm***	15%	115	12%	93	72%	542	99%	750
Child behavior concerns***	31%	1,224	15%	580	54%	2,111	100%	3,915
Child emotional concerns***	24%	432	16%	281	60%	1,064	100%	1,777
Child physical health concerns***	32%	776	15%	349	53%	1,272	100%	2,397
Child age (mean in years)**	7.7	4,197	7.8	1,331	8.1	4,482	7.9	10,010

Source: Trocmé et al. (2005).

Note: N = 10,010; CIS-2003 = 2003 Canadian Incidence Study of Reported Child Abuse and Neglect.

** $p < .01$. *** $p < .001$.

Unsubstantiated versus suspected. Several factors were associated with the decision to classify an investigation as suspected rather than unsubstantiated. Investigations involving referrals by police, caregivers of Other minority status, two or more housing risks, uncooperative caregiver(s), and a child with one or more behavioral concerns were more likely to be suspected than unsubstantiated. The presence of caregiver risk factors, and in particular, three or more risk factors, significantly increased the likelihood that the investigation would be suspected.

Compared to physical abuse (the reference category), investigations for allegations of emotional maltreatment and multiple forms of maltreatment were more likely to

be suspected than unsubstantiated. Maltreatment was also more likely to be classified as suspected if any physical or emotional harm was present. Only two factors increased the likelihood that an investigation would be unsubstantiated. Investigations involving neglect were more likely than cases involving physical abuse to be unsubstantiated than suspected. Referrals from anonymous sources were also more likely than referrals from nonprofessionals to be unsubstantiated.

Substantiated versus suspected. The presence of physical or emotional harm increased the likelihood that maltreatment was substantiated by a factor of 1.8 and 1.5, respectively. Compared to cases referred by nonprofessional

Table 3
Multinomial Regression

	Exp(B) for Unsubstantiated Versus Suspected ^a	Exp(B) for Substantiated Versus Suspected ^b
Form of maltreatment		
Physical abuse only		
Sexual abuse only	1.23	0.48*
Neglect only	1.31*	1.12
Emotional abuse only	0.71*	0.80
Multiple forms	0.54*	1.05
Referral source		
Any nonprofessional referral		
Police referral	0.61*	2.33*
School	0.98	1.06
Other professional referral	0.87	1.14
Anonymous	1.72*	0.97
Other	0.77	0.96
Housing risk		
None		
One	0.88	1.06
Two or more	0.31*	1.16
Family structure		
Two-parent biological		
Two-parent blended/partner	1.01	0.74*
Single parent	0.94	0.81*
Other	0.81	0.86
Ethno-racial status		
White		
Aboriginal	0.86	0.94
Other minority	0.67*	0.99
No. primary caregiver risk factors		
None		
One	0.52*	0.89
Two	0.47*	0.95
Three or more	0.28*	1.08
One/both caregivers uncooperative	0.58*	1.08
Prior substantiated maltreatment	0.99	1.41*
Signs of emotional harm	0.31*	1.53*
Any physical harm	0.34*	1.84*
Child behavior concerns	0.75*	0.99
Child emotional concerns	0.87	0.94
Child physical health concerns	1.07	0.98
Child age	1.00	1.01

Source: Trocmé et al. (2005).

Note: * $p < .05$. $N = 10,010$.

a. Suspected is the comparison category. The Exp(B) reflects the effect of the odds that the cases will be unsubstantiated rather than suspected. The smaller the Exp(B), the less likely it is that the investigation will be unsubstantiated. In other words, smaller values reflect increased likelihood of suspected maltreatment.

b. Suspected is the comparison category. The Exp(B) reflects the effect of the odds that the cases will be substantiated rather than suspected. The larger the Exp(B), the greater the likelihood that the investigation will be substantiated.

sources, investigations for which referrals were made by police were more likely to be classified as substantiated rather than suspected. In addition, maltreatment was more likely to be substantiated if the investigated child was the subject of a prior substantiated report.

Two factors increased the likelihood that a maltreatment investigation was suspected rather than substantiated: blended or single-parent family and allegations involving sexual abuse.

Classification accuracy. Overall, the substantiation status predicted by the model corresponded to the substantiation decisions made by workers for 63.7% of the 10,010 investigations. The level of accuracy attained varied by substantiation status. Seventy-one percent and 76% of the substantiated and unsubstantiated investigations, respectively, were accurately classified by the model. However, none of the investigations in the suspected category were correctly classified by the model. Sixty percent of the investigations coded by workers as suspected maltreatment were classified by the model as substantiated and 40% as unsubstantiated.

Logistic Regression

Five logistic regression analyses were conducted to identify the factors that influence substantiation decisions (Table 4). The first examines substantiated and unsubstantiated investigations, collapsing across all forms of maltreatment. Subsequent analyses examine, by form of maltreatment, the factors associated with substantiated as compared to unsubstantiated investigations. The four forms of maltreatment examined are only physical abuse, neglect only, emotional maltreatment only, and multiple forms of maltreatment, which includes investigations in which more than one form of maltreatment is alleged. The relatively small number of sexual abuse investigations ($N = 462$) precluded examining investigations involving sexual abuse only. The subset of variables examined in the multinomial analyses is examined in logistic regression.

Substantiated versus unsubstantiated. A number of case variables were identified as significant predictors of whether a maltreatment investigation was substantiated rather than unsubstantiated. Compared to nonprofessional referral sources (the reference category), referrals made by police and other professional referrals were 3.8 and 1.3 times more likely to the substantiated than unsubstantiated, respectively.

Other minority ethno-racial status, housing and caregiver risk factors, and lack of cooperation by one or both

Table 4
Logistic Regression Results: Effect on the Odds of an Investigation
Being Substantiated Versus Unsubstantiated

	Logistic Regression (all forms including sexual) (N = 8,679)	Physical Abuse Only (N = 1,898)	Neglect Only (N = 2,771)	Emotional Maltreatment Only (N = 895)	Multiple Forms (N = 2,650)
Form of maltreatment					
Physical abuse only					
Sexual abuse only	0.40*				
Neglect only	0.87*				
Emotional abuse only	1.15				
Multiple forms	1.90*				
Referral source					
Any nonprofessional referral					
Police referral	3.80*	1.07	4.27*	4.06*	7.54*
School	1.06	0.70*	1.10	0.86	1.31
Other professional referral	1.28*	0.89	1.15	1.82*	1.71*
Anonymous	0.57*	0.11*	0.62*	0.46	0.80
Other referral source	1.27	0.56*	2.19*	1.52	0.88
Housing risk					
None					
One	1.29*	1.14	1.68*	1.07	1.01
Two or more	3.37*	2.98*	3.98*	3.66*	2.43*
Family structure					
Two-parent biological					
Two-parent blended/partner	0.75*	0.97	0.63*	1.07	0.74*
Single parent	0.87*	0.83	0.85	1.13	0.88
Other	1.14	0.81	1.96*	1.75	1.16
Ethno-racial status					
White					
Aboriginal	1.10	1.20	1.18	0.86	1.15
Other minority	1.45*	1.85*	1.37*	1.03	1.58*
No. primary caregiver risk factors					
None					
One	1.79*	2.00*	1.72*	1.51	2.59*
Two	2.03*	1.46*	1.91*	2.05*	3.68*
Three or more	3.83*	2.36*	3.60*	3.30*	7.81*
One/both caregivers uncooperative	1.81*	2.06*	1.42*	1.16	2.77*
Prior substantiated maltreatment	1.39*	1.26	1.31*	2.24*	1.45*
Signs of emotional harm	4.80*	3.74*	4.07*	4.16*	6.56*
Any physical harm	5.25*	4.48*	8.51*		7.08*
Child behavior concerns	1.35*	1.37*	1.25	1.46	1.68*
Child emotional concerns	1.09	0.57*	1.29	1.88	1.21
Child physical health concerns	0.94	0.89	1.25	0.84	0.88
Child age	1.01	1.09*	0.97*	0.95*	1.01
Model accuracy					
Pseudo R^2	37%	24%	33%	32%	44%
Overall accuracy	73%	70%	72%	71%	77%
Accuracy in predicting substantiated	71%	50%	61%	85%	96%
Accuracy in predicting unsubstantiated	76%	84%	80%	55%	30%

Source: Trocmé et al. (2005).

* $p < .05$.

caregivers were associated with greater likelihood of substantiation. In comparison with households comprising two biological parents, blended families and single-parent households were significantly less likely to be substantiated than unsubstantiated.

Forms of maltreatment differed in their likelihood of substantiation. Controlling for the other factors in the model, sexual abuse and neglect were less likely than physical abuse to be substantiated. Investigations for more than one form of maltreatment were almost twice as likely as physical abuse to be substantiated. If physical or emotional harm was noted by the worker, the odds of the investigation being substantiated increased dramatically, by a factor of 5.3 and 4.8, respectively. In addition, substantiation was more likely if a prior report of maltreatment of the child was substantiated. Of the three categories of child functioning examined, only the presence of child behavioral functioning concerns increased the likelihood of substantiation.

Classification accuracy. The model explained 37% of the pseudo variance in the decision to substantiate investigations. Classification as substantiated or unsubstantiated was consistent with actual case decisions in 73% of investigations. Moreover, the classification accuracy was similar for both substantiated and unsubstantiated decisions (71% and 76%, respectively).¹

Analyses by Form of Maltreatment

For each case characteristic, the effect on the odds of substantiation, controlling for the influence of other factors in the model, is summarized in Table 4 by form of maltreatment. Across forms, considerable consistency was evident in the case characteristics that increased the likelihood of substantiation. Variables with the most consistency and the greatest effect on the odds of substantiation were two or more housing risks, caregiver risk factors, and the presence of harm. Referrals made by police were much more likely to be substantiated for all forms but physical abuse. The influence of other referral source categories varied slightly by form of maltreatment, but the magnitude of their effect was small relative to the impact of police referral. Other variations were noted. For example, with the exception of emotional maltreatment, cases involving Other minority ethno-racial status and those involving one or more uncooperative caregivers were more likely to be substantiated than unsubstantiated. A history of prior substantiated maltreatment for the child also significantly increased the likelihood that the investigation would be substantiated for all but physical

abuse. Child age had a significant inverse effect for neglect and emotional maltreatment, indicating that investigations involving younger children were more likely than those involving older children to be substantiated. However, older child age was associated with greater probability that a physical abuse investigation would be substantiated. The child functioning concerns related to substantiation varied by form of maltreatment, with child behavioral concerns increasing the odds of substantiation for physical abuse and emotional concerns increasing the probability that emotional maltreatment was substantiated.

Classification accuracy. Table 4 compares the overall predictive accuracy of the model for each form of maltreatment and the predictive accuracy for substantiated and unsubstantiated cases by form. Overall accuracy was similar across forms of maltreatment. In 70% to 77% of the investigations, there was concordance between workers' substantiation decisions and classifications generated by the model. However, the false positive and false negative rates varied by form. The model was better able to predict substantiation for cases involving multiple forms of maltreatment (96%) and emotional maltreatment (85%) than those involving physical abuse (50%) and neglect (61%). Unsubstantiated cases were more accurately predicted than substantiated cases for the latter two forms of maltreatment.

Discussion

The present study examined several issues related to the substantiation of child maltreatment. First, the ability to differentiate suspected from unsubstantiated and substantiated maltreatment was examined. Several factors increased the likelihood that maltreatment would remain suspected rather than classified as unsubstantiated. A police referral, the presence of physical harm or emotional harm, caregiver risk factors, and Other minority ethno-racial status, child behavior concerns, housing risk, and lack of caregiver cooperation made it more likely that investigations would be classified as suspected rather than unsubstantiated.

Several factors also increased the likelihood that maltreatment would be substantiated rather than remain suspected. Police referral, the presence of physical harm or emotional harm, Other minority ethno-racial status, and having one or more prior substantiated maltreatment investigations were associated with greater chances that maltreatment would be substantiated. There was some overlap in the subsets of factors that increased the

likelihood that maltreatment was classified as suspected versus unsubstantiated and those that increased the likelihood that maltreatment would be substantiated rather than suspected. Police referral and the presence of physical harm or emotional harm increased the likelihood that maltreatment would be classified as suspected rather than unsubstantiated and also that maltreatment would be substantiated. In other words, they appear to influence both the decision to classify maltreatment as suspected and the decision to substantiate. This overlap suggests that the presence of these case characteristics makes it difficult for workers to dismiss the possibility that maltreatment occurred, but other case features must be present to warrant substantiation. Caregiver risk factors, child behavior concerns, housing risk, and caregiver cooperation influenced decisions between unsubstantiated and suspected, but these factors did not increase the likelihood that maltreatment was substantiated rather than suspected. Within the context of Drake's (1996) harm/evidence model, these factors may rouse workers' suspicions that maltreatment occurred, but insufficient evidence to corroborate allegations and a lack of harm render the decision inconclusive rather than substantiated.

Despite these differences, the multivariate analyses indicated that suspected maltreatment could not be accurately differentiated from unsubstantiated or substantiated cases. In other words, there was more overlap in characteristics than there are differences. Sixty percent of investigations with suspected maltreatment were classified by the model as substantiated; the remainder had case characteristics that resembled unsubstantiated cases, and the multinomial model was unable to correctly classify a single case of suspected maltreatment. Thus, there was not a sufficiently consistent pattern to warrant combining suspected cases under either category. This finding has implications for researchers contemplating collapsing categories for analysis. These findings are consistent with the findings reported by English et al. (2002) and with Herman's (2005) argument that the results of maltreatment investigations should not be forced into unsubstantiated versus substantiated classification categories.

The next set of analyses examined whether unsubstantiated and substantiated cases could be differentiated and the types of factors that distinguished these cases. Multivariate analyses of unsubstantiated versus substantiated maltreatment indicated that these categories are distinguished by a number of case features. As with previous studies, we found that signs of emotional or physical harm and previous known maltreatment were

strong predictors of case substantiation (Haskett et al., 1991). However, in contrast to these studies, we did not find that child age was associated with substantiation decisions for overall maltreatment. Analyses by form of maltreatment revealed that older child age increased the likelihood of substantiation in cases of physical abuse, but younger children were more likely than older children to have neglect and emotional maltreatment substantiated. Our results are also consistent with previous studies' findings that caregiver and environmental risk factors play an important role in the case substantiation decision (English et al., 2002; Scannapieco & Connell-Carrick, 2005; Trocmé et al., 1995).

Child functioning concerns were associated with substantiation in the maltreatment-specific analyses, and collapsing across forms of maltreatment, the manifestation of child behavioral difficulties increased the likelihood that maltreatment was substantiated. It is important to consider these findings in light of the prior set of analyses, which included suspected cases. Caregiver, child behavioral concerns, and housing risk factors did not differentiate suspected and substantiated decisions. Thus, these case characteristics may be associated with a reduced likelihood of having maltreatment classified as unsubstantiated, but on their own, they may be insufficient bases for substantiating maltreatment.

Somewhat surprisingly, investigations involving single parents or a step-parent were less likely to be substantiated compared to two-parent families. It is not clear why, controlling for parent risk factors and forms of maltreatment, cases involving two biological parents would be more likely to be substantiated. Controlling for maltreatment severity, form of maltreatment and housing problems, a history of prior substantiated maltreatment, source of referral, lack of caregiver cooperation, and to a lesser extent ethno-racial background were significantly related to the decision to substantiate maltreatment. In fact, along with severity of harm, caregiver and housing risk factors and referral by police were among the most important predictors of case substantiation. The influence of police referral, even after controlling for type and severity of maltreatment, suggests that police referrals may be perceived to be more credible and is consistent with previous studies that have found that referrals from the police are more likely to be substantiated (Eckenrode et al., 1988; English et al., 2002; Kesner & Robinson, 2002).

We also found that cases involving Other minority caregivers were more likely to be substantiated than were cases involving White caregivers. This finding is consistent with previous studies that have found evidence

of some ethno-racial bias in maltreatment substantiation decisions (Church, Gross, & Baldwin, 2005; Haskett et al., 1991; King et al., 2003). It is possible that with the inclusion of a valid index of socioeconomic status (a poor measure in the CIS), some of these differences may prove to be insignificant. Overall, classification accuracy was adequate, and 37% of the variance in substantiation was explained by the characteristics included in the model. However, the false negative rate was 24%, and 29% of the cases were false positives. Factors relevant to these decisions may be missing from the model. It is also possible that there is some inconsistency across workers in the criteria used to substantiate maltreatment investigations.

Finally, the factors that differentiate unsubstantiated from substantiated cases were examined for each form of maltreatment. Although rates of substantiation varied significantly by form of maltreatment, the maltreatment-specific analyses did not reveal dramatically different substantiation criteria by form of maltreatment. Classification accuracy generally did not improve for the maltreatment-specific models, other than for cases involving multiple forms of maltreatment, which correctly classified 77% of cases with a pseudo R^2 of .44. However, the false positive rate was high, with only 30% of unsubstantiated cases correctly classified. Across forms of maltreatment, there was substantial consistency in the variables identified as most influential. There were some noteworthy differences with respect to the effect of child age in the role of child functioning problems and in the role played by referral sources. Although Scannapieco and Connell-Carrick (2005) argue that it is important to analyze substantiation decisions by type of maltreatment, their findings are consistent with ours in that there were few differences between the factors associated with the substantiation of neglect compared to physical abuse. It is important to note, however, that when applied to different forms of maltreatment, the model yielded different false positive and false negative rates. Some factors relevant to the decision to substantiate maltreatment may be missing from the model. Alternatively, case characteristics may interact to create synergistic effects on the likelihood of substantiation. Interaction terms were not included in the models.

Conclusion

One purpose of these analyses was to assist researchers in making decisions about how to include suspected cases in their studies. Although a variety of factors may influence the likelihood that an investigation will be suspected

rather than substantiated or unsubstantiated, the multinomial analysis suggests that suspected maltreatment is a mixed category that is not entirely distinct from the other two levels of substantiation. There was sufficient overlap in the case characteristics for 60% of the suspected cases to be misclassified as substantiated. The other 40% of suspected cases were misclassified as unsubstantiated. These findings suggest that in analyzing statistics from jurisdictions using a suspected maltreatment category, the suspected cases should not be collapsed into the substantiated or the unsubstantiated category.

A series of logistic regression analyses was employed to examine the factors that influenced substantiation decisions and whether the factors related to the decision to substantiate differed by form of maltreatment. Analyses of the CIS-2003 data indicate that a number of case characteristics differentiate with reasonable accuracy substantiated from unsubstantiated maltreatment. Analyses also indicate that substantiation decisions are generally made in a fashion that is relatively consistent with the types of clinical factors that seem reasonable to consider in such cases. Along with severity of emotional or physical harm, parent risk factors, and housing risk factors, police referrals were among the most important predictors of case substantiation. Cases involving multiple forms of maltreatment were also much more likely to be substantiated. Although some relationships (e.g., effect of child age) varied by form of maltreatment, there was considerable consistency in the case characteristics that increased the likelihood that maltreatment would be classified as substantiated rather than unsubstantiated. Differences in the relative accuracy of the model across forms of maltreatment suggest that greater model refinement is needed.

There is a growing body of research in the United States on the factors that influence the decision to substantiate maltreatment. This study extends these investigations to a large Canadian sample. Our analyses indicate that these decisions appear to be driven primarily by clinical information used to establish the occurrence and severity of maltreatment. Although the ability to differentiate substantiated and unsubstantiated cases does not attest to the validity of those decisions (whether maltreatment really occurred), findings do not support the suggestion that the decision to substantiate is an arbitrary one.

Note

1. To assess the robustness of these findings, the sample was divided randomly into two subsamples ($N_1 = 4,302$ and $N_2 = 4,311$), with the same logistic regression model applied to each. With the

exception of three effects, the pattern of findings and accuracy of the models were comparable. In one model, other professional referral, blended family structure, and having one housing risk factor did not significantly increase the odds of substantiation. These effects were significant in the second model. Accuracy for N1 was 73.8% overall, with 76.0% and 71.6% of unsubstantiated and substantiated cases accurately classified, respectively. Similarly, overall accuracy for N2 was 73.9% overall, with 76.6% and 70.3% of unsubstantiated and substantiated cases accurately classified, respectively.

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