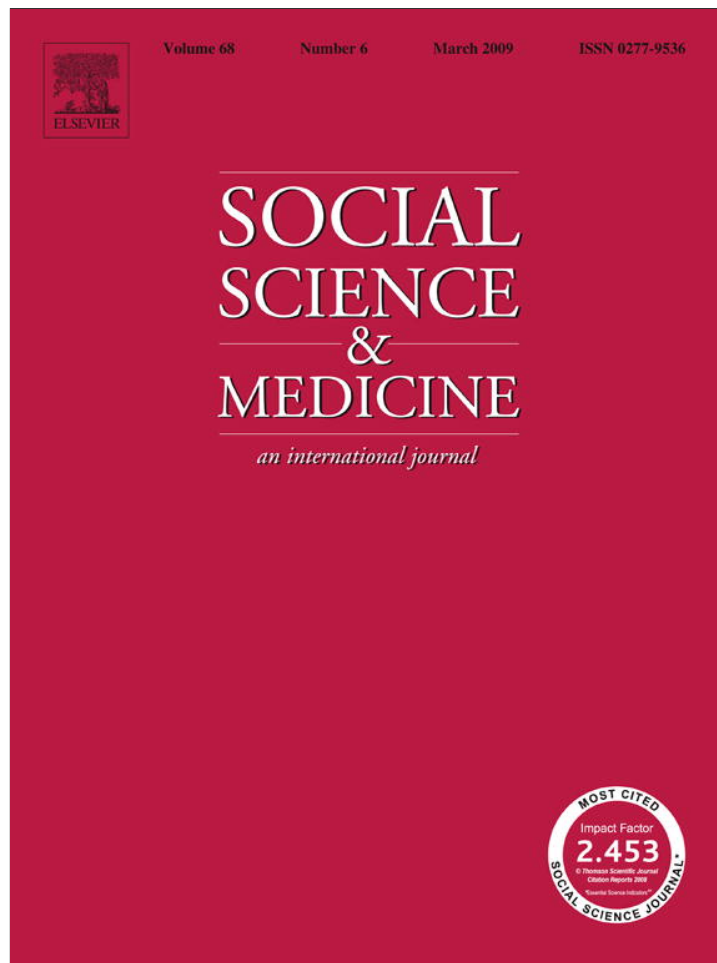


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Modelling the effects of intimate partner violence and access to resources on women's health in the early years after leaving an abusive partner[☆]

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ABSTRACT

Although the negative health effects of intimate partner violence (IPV) are well documented, little is known about the mechanisms or determinants of health outcomes for women who had left their abusive partners. Using data collected from a community sample of 309 Canadian women who left an abusive partner, we examined whether women's personal, social and economic resources mediate the relationships between the severity of past IPV and current health using structural equation modelling. A good fit was found between the model and data for hypothesized models of mental and physical health. In the mental health model, both the direct and total indirect effects of IPV were significant. In the physical health model, the direct effect of IPV on physical health was about four times as large as the total indirect effects. In both models, more severe past IPV was associated with lower health and women's personal, social, and economic resources, when combined, mediated the relationship between IPV and health. These findings demonstrate that the health outcomes of IPV for women who have left an abusive partner must be understood in context of women's resources.

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Intimate partner violence (IPV), a pattern of physical, sexual and/or emotional violence by an intimate partner in the context of coercive control (Tjaden & Thoennes, 2000), is a serious public health problem worldwide (World Health Organization, 2005). The relationship between IPV and a range of negative health outcomes has now been firmly established (Campbell, 2002; Golding, 1999). The health effects of IPV may result from physical injury and from women's physical and psychological responses to trauma (Plichta, 2004; Sutherland, Bybee, & Sullivan, 2002) as well as from increased health risk behaviors, such as smoking or substance abuse (Weaver & Resnick, 2004). The challenge for the coming decade is to better understand the pathways that explain the

impact of IPV on health outcomes (Dutton et al., 2006; Kendall-Tackett, 2005), leading to a more contextualized understanding of both the direct and indirect effects of IPV on health. The primary question must shift from *whether* abuse affects health to *how* varied abuse experiences cause health problems, *who* recovers from these problems, *who* is most at-risk of sustained poor health, and how the *conditions of women's lives* impact outcomes *over time* as a basis for developing more effective, evidence-based policies and services for women. Although most women eventually leave their abusive partners or manage to make the violence end (Campbell & Soeken, 1999), studies of the health effects of IPV have not distinguished women who have left their partners from those who have not. The consequences of IPV for women *after leaving* and the impact of women's resources on their health during this transition period are poorly understood. Women who have left abusive partners need to be healthy and functional for their own well-being and so that they can fulfill their social roles as parents, be economically self-sufficient, and contribute fully to society.

In this paper, we examine the role of women's access to personal, social and economic resources in mediating the

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relationships between the severity of past IPV and current mental and physical health by testing a theoretical model using cross-sectional, baseline data from an ongoing, longitudinal investigation, the *Women's Health Effects Study*. Data used in this analysis were collected between June 2004 and December 2005. This analysis begins the process of unravelling the relationships among these factors, and, in particular, in examining both the direct and indirect effects of IPV severity on health outcomes for women after leaving an abusive partner.

Review of literature

Although studies examining the health consequences of IPV have often included women who have left or are in the process of leaving an abusive partner, whether these women differ from those who remain with their partners has not been systematically addressed. There are important reasons to focus specifically on women's health as they transition out of an abusive relationship. Contrary to the assumption that separation from the abusive partner eventually resolves the most significant problems that women face, including health problems, both improvements and deterioration in specific health outcomes have been documented in the few longitudinal studies in which mental health consequences of IPV have been examined (Campbell, Sullivan, & Davidson, 1995; Mertin & Mohr, 2001; Woods, 2000). Sutherland, Bybee and Sullivan (1998) found that symptoms of physical and mental health problems declined over a 14-month period after leaving a shelter while Campbell and Soeken (1999) found that physical health improved over a 3.5-year period only for women who were no longer experiencing abuse. Importantly, Rivara et al. (2007) found that, although health care costs declined over a 5-year period after separation, these costs remained 20% higher for abused versus non-abused women. These studies reinforce importance of identifying the most salient predictors of women's mental and physical health in the post-leaving period.

Transitions are characterized by greater openness to change and help seeking (Meleis, Sawyer, Im, Hilfinger Messias, & Schumacher, 2000) and women's use of services to support the leaving process has been well documented (Plichta, 1992). While these clinical encounters provide opportunities to address women's health and social problems, such practices need to be informed by research that considers the unique context of women's lives after leaving their abusive partners. There is growing evidence to suggest that women's health and lives after leaving an abusive partner are complex. Women often feel a profound sense of "freedom", relief, and an enhanced sense of control which facilitates their continued efforts to disengage from their partners (Anderson & Saunders, 2003; Ford-Gilboe, Wuest, & Merritt-Gray, 2005). Concurrent with growth and opportunity, multiple losses and life changes after leaving may lead to growing uncertainty and reinforce a sense of vulnerability (Wuest, Ford-Gilboe, Merritt-Gray, & Berman, 2003). Women's risk of continued violence from their ex-partners frequently intensifies after leaving (Tjaden & Thoennes, 2000). Furthermore, findings from a qualitative grounded theory study suggest that women and their children experience varying levels of "intrusion" or unwanted interference in their lives from multiple sources: harassment and/or ongoing abuse from the ex-partner, the demands of managing health problems, economic hardships, changes in living arrangements and social networks, and the personal "costs" of getting needed help (Wuest et al., 2003). Such intrusion makes it more difficult for women to care for themselves and their children (Ford-Gilboe et al., 2005; Wuest et al., 2003).

We contend that the context of women's lives after leaving is central to understanding their health. From a determinants of health perspective (Evans, Barer, & Marmor, 1994; Moss, 2002),

women's health is shaped by income and social status, education, social support networks, employment and working conditions, social environment, physical environments, personal health practices and coping skills, health services, healthy childhood development, gender, and culture (Health Canada, n.d.). However, existing studies of the health consequences of IPV have not consistently accounted for variation in women's health according to their life circumstances (Briere & Jordan, 2004), including their access to needed resources. These limitations may be due, in part, to an over-reliance on samples of women recruited from shelters, possibly limiting variation in factors that may affect health, such as socioeconomic status and social support (Sutherland, Sullivan, & Bybee, 2001). In this study, we address this problem by seeking to account for diversity in women's social location through recruitment of a community sample and by examining the impact of their access to resources on both mental and physical health.

The critical role of resources in women's lives while in the abusive relationship and during the process of leaving has been documented, but there is limited understanding of the role of resources beyond the initial period of separating from the partner. Resources are capacities of the woman and her social group, which are linked to health, and vary in magnitude from a deficit or disadvantaged position (i.e. low resources) to one of abundance/advantage (i.e. high resources). Resilience, a personal resource, is thought by some to develop out of exposure to adversity and, once developed, may shape how people respond to new challenges (O'Leary, 1998). While findings of qualitative studies portray women as "survivors", documenting personal strengths, such as resourcefulness, problem-solving and determination, as well as personal growth that often occurs after leaving (Campbell, Rose, Kub, & Nedd, 1998; Wuest & Merritt-Gray, 1999), the association between women's personal resources and health after leaving has not been well studied.

Social resources have both positive and negative dimensions which may affect health (Tilden & Galyen, 1987). In the context of IPV, family members and friends may provide refuge, resources, and emotional support, but may also minimize experiences of abuse and blame the woman (Barnett, 2001; Lempert, 1997). IPV is associated with social isolation and separation from a partner may further reduce social networks due to relocation or alignment of friends with the abusive partner (Walker, Logan, Jordan, & Campbell, 2004; Wuest et al., 2003). In cross-sectional studies of women who have experienced IPV, social support has been positively associated with general health status (Coker, Watkins, Smith, & Brandt, 2003), a reduction in symptoms of physical and psychological distress while in shelter (Humphreys, Lee, Neylan, & Marmor, 2001; Wang & McKinney, 1997) and lower levels of depression 6 months post-shelter (Campbell et al., 1995). Women's access to social resources (both positive and negative) may mediate the relationship between past abuse and current health, yet this relationship has not been systematically studied in the post-leaving period.

Economic resources are a key determinant of health, yet being in an abusive relationship typically restricts women's economic independence, making employment difficult (Davis, 1999; Swanberg, Logan, & Macke, 2005; Tolman & Rosen, 2001), limiting access to income and impeding women's self-sufficiency after leaving (Moe & Bell, 2004). Willingness to give up financial support or marital assets in exchange for greater custody and less visitation (Davis, 1999) and the costs of multiple moves, legal bills, security measures, counselling, medications and debts incurred by ex-partners (Varcoe & Irwin, 2004; Wuest et al., 2003) erode women's financial resources over time. The stress associated with financial problems may lead to or exacerbate health problems (Carlson, McNutt, Choi, & Rose, 2002; Sutherland et al., 2001), yet the impact

of women's economic resources on health after leaving has been largely ignored in previous research.

This study begins the process of building a context-specific understanding of women's health after leaving by addressing the role of women's personal, social and economic resources in mediating the relationship between the severity of past abuse and current mental and physical health. This knowledge is essential for developing more effective ways to assist women in regaining and improving their health after separation from an abusive partner (Ford-Gilboe, Wuest, Varcoe, & Merritt-Gray, 2006).

Theoretical model

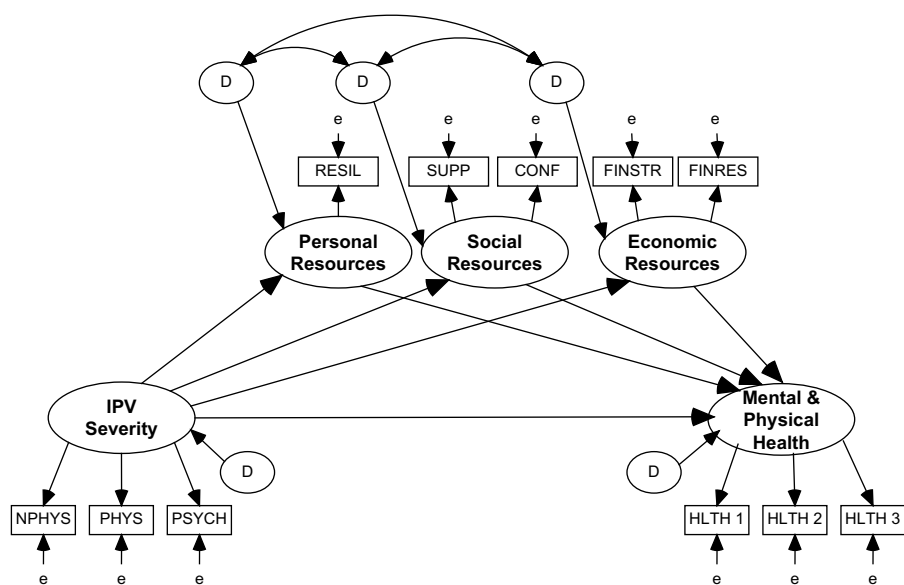
Based on previous research and a determinants of health perspective (Health Canada, n.d.), a structural equation model was constructed to assess the effect of past IPV and current resources on women's mental and physical health (Fig. 1). This model contains 5 latent variables and 11 indicators. Detailed information about the indicators used to represent each latent variable is provided in the measurement section of this paper. The hypothesized relationships

between the latent variables of primary interest are represented by bold straight arrows. *IPV Severity* is proposed to have a direct negative effect on both *Physical Health* and *Mental Health*. *Personal Resources*, *Social Resources* and *Economic Resources* are proposed to exert direct positive effects on women's *Mental Health* and *Physical Health* and to mediate the relationship between *IPV Severity* and health outcomes, such that more severe past IPV results in greater erosion of women's resources, leading to poorer health outcomes. The three mediating variables were hypothesized to correlate freely among themselves. Given that the relationship between age and health is well established, the manifest variable *Age* (not shown on the diagram) was included in the model as a control variable.

Method

Sample

A community sample of 309 English-speaking women who were between the ages of 18 and 65 years of age, had experienced IPV in the past 3 years and were no longer living with an abusive male



Latent Variable	Indicators	Alpha ¹	Factor Loadings	
			MH ²	PH ³
IPV Severity	ISA Non-Physical Abuse Score (NPHYS).	.83	.83	.84
	ISA Physical Abuse Score (PHYS)	.84	.70	.70
	WEB total score (PSYCH)	.82	.70	.69
Personal Resources	Resilience Scale Total Score (RESIL)	.91	1.00	1.00
Social Resources	IPRI Social Support Score (SUPP)	.92	.53	.57
	IPRI Social Conflict Score (CONF)	.91	-.62	-.58
Economic Resources	Financial Strain Index Total Score (FINSTR)	.90	-.90	-.90
	"Overall, how difficult it is to live on your income right now?" (FINRES)		.84	.84
Physical Health	SF12v2 Physical Health Index (HLTH 1)	.85	---	.90
	Chronic Pain Scale Intensity Score (HLTH2)	.84	---	-.71
	PASS GI Symptom Frequency Score (HLTH3)	.65	---	-.55
Mental Health	SF12v2 Mental Health Index (HLTH1)	.82	.85	---
	CESD Total Score (HLTH2)	.93	-.92	---
	DTS overall score (HLTH3)	.95	-.60	---

Fig. 1. Hypothesized structural equation model with latent variables and indicators. Note: ¹Alpha = Cronbach's alpha internal consistency reliability coefficients for each scale; ²MH = mental health model; ³PH = physical health model. D = variance in endogenous latent variables that is not accounted for in the model.

partner, was recruited from three Canadian provinces. Exposure to IPV in the relationship with the woman's ex-partner was confirmed using a modified version of the Abuse Assessment Screen (AAS) (Parker & McFarlane, 1991) which included four items (one each for physical abuse, forced sex, fear of partner, and experiences of coercive control). An affirmative response to at least one of four screening questions was considered positive for IPV. Although there is no standard method for calculating sample size for testing structural equation models, there is growing consensus that samples of 200–400 result in the most stable estimates across different fit indices (Hoyle, 1995; Jackson, 2001). The sample size for this study was determined taking these recommendations into account.

Women were recruited using advertisements placed in community settings (e.g. libraries and community centers), service agencies (e.g. shelters and health clinics) and through media coverage. Women contacted the research team by telephone or email, were screened for eligibility, and, if eligible, were provided with a verbal description of the study and invited to participate. Of the 353 women who met the study inclusion criteria, all agreed to participate and 309 (87.5%) completed wave 1. The reasons for loss of 49 participants from screening to interview were: unable to locate the woman and/or set up an interview ($n = 26$); woman changed her mind about taking part ($n = 21$); increased health problems ($n = 1$) or safety risks ($n = 1$) prevented participation.

Considerable variability is evident with respect to demographic characteristics and abuse histories of women in the sample. The mean age of participants was 39.4 years ($SD = 9.80$, range 19–63) and women had completed an average of 13.4 years of education ($SD = 2.60$, range 6–22 years). Slightly more than half (56.3%, $n = 174$) were parenting a child under the age of 18 years. Although almost half (45%, $n = 139$) of participants were employed, the vast majority (90%) of women reported difficulty living on their current incomes. Annual income ranged from \$0 to \$95,000 Canadian per year, with a mean income of \$20,391 ($SD = 17,145$, Median \$15,684). Although the majority of women were Caucasian, 16.8% ($n = 51$) identified themselves as members of a visible minority group and 7.4% ($n = 23$) reported that they were Aboriginal. Most (66.0%) reported experiences of abuse when they were children, 40% had experienced a sexual assault as an adult not including the relationship with their ex-partner and 59% had been in more than one abusive partner relationship. All participants had experienced coercive control in the relationship with their former partner (as indicated by a score > 19 on the Women's Experiences of Battering (WEB) Scale). Not surprisingly, although women had left their abusive partners an average of 20 months previously (range 3–40, $SD 10.2$), 40% reported that abuse from their ex-partner was ongoing.

Study procedures

Data were collected in two phases through completion of a structured interview designed to elicit information about women's resources, service use and demographic characteristics, followed within 2–3 weeks by an in-depth abuse history and health assessment conducted by a Registered Nurse. A combination of standardized self-report measures, survey questions and bio-physical tests were used to measure the variables of interest. Data were collected in a private location of the women's choice (e.g. home or community agency) by trained interviewers, with each session lasting 60–90 min. The few women who lived more than 2 h from a study sites were given the option of completing the structured interview by telephone. Computer assisted data entry (CADE), supported by SPSS Data Entry Enterprise Software (<http://www.spss.com/dataentry>) was used, with data entered as they were obtained using a laptop computer. Women were offered

a participation fee of \$30 for each session completed and reimbursed for childcare and transportation costs. Ethics approval was obtained from the Research Ethics Board at each study site prior to recruitment and written consent was obtained from each woman prior to data collection. A detailed safety protocol, including guidelines for debriefing women at the end of each session, was used to guide all interactions between women and the research team.

Measurement

Since the latent variables are theoretically complex, multiple indicators were selected to represent varied dimensions of each. Scores derived from established scales as well as responses to individual survey items were used as indicators of each latent variable, with all scores reflecting higher levels of the variables being measured (see Fig. 1). Internal consistency of each scale was > 0.80 , with the exception of the gastrointestinal symptom frequency score of the Partner Abuse Symptom Scale, a newer scale containing only five items ($\alpha = 0.65$). Age, a manifest variable, was measured using women's self-report of their current age in years.

IPV severity

The intensity of past physical and non-physical violence directed toward a woman while she was living with the intimate partner she recently left (i.e. the *index partner*), was measured using three indicators. Total scores for physical (11 items) and non-physical (19 items) abuse, derived from the 30-item Index of Spouse Abuse (ISA) (Hudson & McIntosh, 1981), were used as the first two indicators of IPV Severity. On the ISA, women were asked to rate the frequency of abusive acts directed toward them by the index partner ranging from "never" (0) to "very frequently" (4). Using standard scoring for the ISA, overall and subscale scores (physical and non-physical abuse) were computed by weighting individual items for severity and summing these weighted scores, for a possible range of 0–100 (Hudson & McIntosh, 1981). To complement the ISA focus on abusive acts, the total score on the 10-item Women's Experiences of Battering (WEB) scale was used to tap into women's experiences of loss of power and control in the context of IPV (Smith, Earp, & DeVellis, 1995; Smith, Smith, & Earp, 1999) on a 6-point Likert scale ranging from strongly agree (1) to strongly disagree (6). Items on the WEB were reversed scored and their values summed to produce a total score ranging from 10 to 60. Sample items include: "I felt owned and controlled by him", "I felt like I was programmed to act a certain way with him."

Mental Health

The two health outcome variables were defined to include both symptoms experienced by women and their everyday functioning. *Mental Health* was assessed using three indicators. Using the Short-Form Health Survey version 2 (SF-12v2) (Ware, Kosinski, Turner-Bowker, & Gandek, 2002), a general index of past month mental health was created by summing and averaging subscale scores for emotional, role performance, vitality, social functioning, mental health, resulting in a continuous variable with a range of 0–100. Measures of symptoms of depression and PTSD were also included due to the prevalence of these potentially debilitating problems in IPV survivors (Golding, 1999). The total score on the 20-item Center for Epidemiologic Studies-Depression (CES-D) Scale (Comstock & Helsing, 1976; Radloff, 1977) was used to measure depressive symptomology. Women's ratings of symptom frequency in the past week on a 4-point scale (1 = rarely or none of the time to 4 = most of the time) were summed to produce total scores (range 0–60). Finally, the overall score on the 17-item Davidson Trauma Scale (DTS) (Davidson, 1996; Davidson et al., 1997) was used to assess the

presence of PTSD symptomology. Women who identified themselves as having experienced a traumatic event were asked to rate the past week frequency and severity of symptoms consistent with DSM-IV diagnostic criteria for PTSD. Separate frequency and severity scores were computed by summing the responses to applicable items (range 0 = 56), while the overall score was created by summing the frequency and severity scores (range 0–136).

Physical health

Physical Health was measured by three indicators. First, a general index of past month physical health was created by summing and averaging scores for physical role performance, physical functioning, pain, and general health on the SF12v12 (Ware et al., 2002). Since chronic pain is a serious and often disabling problem for women who have experienced IPV (Coker, Smith, & Fadden, 2005), pain intensity measured using the pain intensity score from Von Korff, Ormel, Keefe, and Dworkin's (1992) 7-item chronic pain scale was the second indicator of physical health. Total pain intensity scores (range 0–10) represent the mean of women's ratings of current pain, worst pain and average pain in the last 6 months on scales ranging from 0 (no pain) to 10 (worst pain imaginable). The third indicator of *Physical Health*, frequency of gastrointestinal symptoms, was measured using the 5-item gastrointestinal symptom frequency score of the Partner Abuse Symptom Scale (PASS; Ford-Gilboe et al., unpublished manuscript). The PASS was developed to measure the pattern and severity of injuries and symptoms associated with IPV. On the symptom profile, women rated 44 symptoms or health problems along five dimensions. Past month frequency was rated on a 4-point scale ranging from 0 (never) to 4 (very frequently). Symptoms reflect six domains (gastrointestinal, reproductive, neurological, pain, cardio-respiratory and mental health), with this structure validated through confirmatory factor analysis in MPLUS. For symptom frequency, total and subscale scores are computed by summing responses to applicable items and dividing them by the number of items in the scale (range 0 = 4) (Ford-Gilboe et al., unpublished manuscript).

Personal resources

The internal strengths or capacities (i.e. knowledge, beliefs, skills, behaviors) of the woman, were measured using a single indicator, the total score on the Resilience Scale (RS; Wagnild & Young, 1993), a 25-item summated rating scale used to assess women's capacity to persevere and adapt when facing adversity. The RS uses a 7-point response format (1 = strongly agree to 7 = strongly disagree) and the total score ranges from 25 to 175. Sample items include: "My belief in myself gets me through hard times", "I am determined", "I do not dwell on the things I cannot do anything about". The RS has demonstrated strong reliability and validity among community dwelling adults (Wagnild & Young), mothers of preschool children (Black & Ford-Gilboe, 2004; Monteith & Ford-Gilboe, 2002) and homeless adolescents (Rew, Taylor-Seehafer, Thomas, & Yockey, 2001).

Since relationships have both positive and negative dimensions, two indicators of *Social Resources*, one positive and one negative, were included in this study. Social support, the quality of emotional and tangible aid provided by the woman's network, was measured using the 13-item support scale of the Interpersonal Resources Inventory (IPRI; Tilden, Hirsch, & Nelson, 1994), while social conflict, perceived discord or stress within relationships was measured on the 13-item conflict scale. Ratings used a 5-point scale and responses to applicable items were summed to produce separate scores for social support and social conflict (range 0–65).

Economic resources

Monetary and material assets that are tied to financial stability or stress, were measured using two indicators which reflect the

stress associated with limited resources. The total score on the Financial Strain Index (FSI; Ali & Avison, 1997) was used as an indicator of stress associated with specific financial obligations. Participants rated the difficulty they experienced in meeting their financial commitments in 14 areas (e.g. housing, transportation, debt repayment) on a 4-point Likert scale ranging from 1 (very difficult) to 4 (not at all difficult). A total score was computed by reverse scoring and summing responses to all items (range 0–56). The second indicator of *Economic Resources* was a single item that provided a more global assessment of economic strain: "Overall, how difficult is it for you to live on your total household income right now"? Women responded to this item using a 5-point scale ranging from not at all difficult (1) to very difficult or impossible (5).

Data analysis

The hypothesized model was analyzed using structural equation modelling (SEM) techniques (Bollen, 1989). SEM simultaneously estimates the relationships between observed and latent variables (the measurement model) and among latent variables themselves (the construct model), providing estimates of both direct and indirect, or mediating, effects. Since preliminary data analysis revealed that all variables in the models satisfied the assumptions of normality and multicollinearity and there were no outliers, Maximum Likelihood (ML) using MPLUS version 4.1 (Muthen & Muthen, 2006) was used for data analysis. No differences were observed between the bootstrapped estimates of the standard errors and those obtained in the maximum-likelihood model, indicating that the model did not violate the assumption of a normal distribution. MPLUS offered the additional benefit of formally testing the significance of direct and indirect effects. To assign a scale to each of the latent variables, the metric of one of the indicators, the reference indicator, was used.

Of the 309 women participating in this study, 50 women failed to provide responses to all items. A listwise deletion of these cases would have resulted in the loss of about 16% of the total sample. Thus, the proposed model was first estimated using a listwise deletion method and then re-estimated using a full-information, maximum-likelihood (FIML) technique, taking into account all observed data points. The results from the full-information, maximum-likelihood model are discussed here, since the parameter estimates were almost identical using these two methods, both in magnitude and in the level of significance.

Several criteria were used to evaluate fit of the proposed models, including the χ^2 test (Jöreskog & Sörbom, 1989), the Comparative Fit Index (CFI; Bentler, 1990), the Incremental Fit Index (IFI; Bollen, 1989), and Root Mean Square Error of Approximation (RMSEA; Browne & Cudeck, 1989). The generally agreed upon critical values for assessing model fit are 0.90 or higher for CFI and IFI (Kline, 2005) and less than 0.07 for RMSEA. Modification indices were computed for each parameter that was constrained to zero within the model. However, the decision to add paths suggested by these indices was made on theoretical, not empirical, grounds.

Results

Model fit

Initial analysis revealed a good fit between the model and data for both hypothesized models using standards recommended by Bentler and Bonett (1980) and Browne and Cudeck (1989). The mental health model was found to have excellent fit, χ^2 (41) = 71.04, $p = 0.003$; CFI = 0.977; TLI = 0.962; RMSEA = 0.049. The physical health model also fit the data well, χ^2 (41) = 94.67, $p < 0.001$; CFI = 0.946; TLI = 0.914; RMSEA = 0.065. Furthermore,

Table 1
Descriptive statistics for indicators of latent variables (N = 309).

Variable/indicator	Mean	SD	Range
Severity of physical IPV	48.6	23.47	7.2–100
Severity of non-physical IPV	65.4	18.63	18.5–100
Women's responses to abuse	53.3	7.00	21–60
Resilience	133.8	22.33	42–173
Social support	51.6	10.27	16–65
Social conflict	42.0	11.59	13–65
Financial strain	41.0	11.58	14–56
Overall difficulty living on income	3.3	1.42	1–5
General physical health	45.3	12.76	14.4–68.7
Chronic pain intensity	49.0	25.80	0–100
Gastrointestinal symptom frequency	0.98	0.88	0–4
General mental health	36.8	12.70	2.7–64.4
Depressive symptom severity	25.2	13.03	0–54.7
PTSD symptomology	47.5	30.78	0–125

the modification indices for each model were modest and did not suggest changes to further improve model fit. Thus, both proposed models accounted adequately for the observed co-variances among the indicators, providing general support for the hypothesized models.

Measurement model

Descriptive statistics for the indicators used in the measurement model are presented in Table 1. An inspection of the parameter estimates and *t* values provides support for the hypothesized structure of the measurement model. The factor

loadings were all statistically significant and of substantial magnitude (0.53–0.92) (Fig. 1). There were no unreasonable parameter estimates, such as negative variances or correlations greater than one, and all appeared to be in the expected range of values.

Direct versus indirect effects of IPV

In the mental health model, both the direct ($B = 0.19, t = -3.20$) and total indirect ($B = 0.15, t = -2.24$) effects of IPV were significant and of similar magnitude. While significant direct ($B = 0.35, t = -5.08$) and total indirect ($B = 0.09, t = -2.30$) effects were also observed in the physical health model, the direct effect of IPV on physical health was about four times as large as the total indirect effects. Thus, in both models, when combined, women's resources significantly mediated the relationship between IPV and health as hypothesized. However, each type of resource was not a significant mediator on its own, after controlling for the effects of the other two resources. In comparing the magnitude of direct effects across the models, *IPV Severity* exerted a stronger direct effect on *Physical Health* than on *Mental Health* ($\beta = -0.35$ versus -0.23). As expected, more severe past IPV was associated with poorer health in both models, also supporting our hypothesis. In Fig. 2, for each model, the Standardized regression coefficients (*B*) for each individual path are shown in bold type, while the unstandardized coefficients (β) are shown in brackets. These path coefficients represent the "pure" relationships between each set of variables in the model, after controlling for the effects of all other variables. The combined

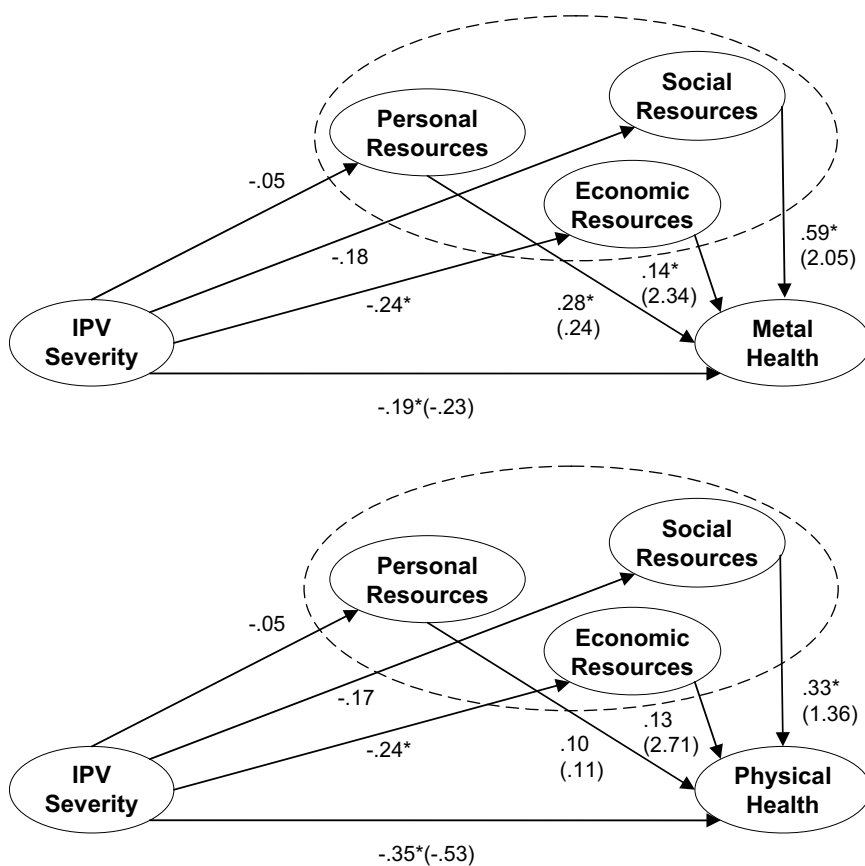


Fig. 2. Results of testing hypothesized causal models – direct and total indirect effects. Notes: standardized path coefficients = *B* (used to compare within models). Unstandardized path coefficients = betas (used to compare across models). Space enclosed within the dotted line (---) illustrates the combined mediating effect of resources **p* < 0.05.

mediating effect of resources is illustrated by enclosing these variables in the space marked by a dotted line (---).

Other direct effects

Although the purpose of this analysis was to test whether *IPV Severity* exerted both direct and indirect effects on women's health, inspection of the regression coefficients for individual paths in the model also produced some relevant and interesting findings (Fig. 2). In the mental health model, *IPV Severity* exerted a direct negative effect on Economic Resources, but had no direct effect on Personal Resources or Social Resources. As expected, more severe past *IPV* was associated with poorer economic resources. In addition, each of the mediator variables had direct positive effects on Mental Health, with Social Resources exerting the strongest effects ($B = 0.59$). With respect to the physical health model, *IPV Severity* also exerted direct negative effects on Economic Resources. In contrast to the mental health model, only one of the mediator variables, Social Resources, exerted a direct positive effect on Physical Health.

Discussion

Our findings suggest that past *IPV* continues to exert direct negative effects on women's mental and physical health an average of 20 months after leaving and that the extent of this impact depends on the *severity* of abuse. These findings are particularly salient because they reinforce the emerging understanding that the problems experienced by women attempting to escape by leaving remain intrusive for varying lengths of time (Wuest et al., 2003). In doing so, the findings also contradict the common assumption that the act of leaving ends the problems associated with being in an abusive relationship.

Our results also extend the findings of our previous qualitative research (Ford-Gilboe et al., 2005; Wuest et al., 2003) addressing women's lives and health after leaving by documenting specific causal associations between severity of past *IPV*, current resources and mental and physical health. In particular, this study contributes to understanding the mechanisms by which past *IPV* and current access to resources affect women's mental and physical health after leaving an abusive partner. Significant direct and indirect effects were noted in testing both causal models, suggesting that the impact of past *IPV* on women's health after leaving must also be understood in the context of women's access to resources.

Consistent with a determinants of health perspective (Health Canada, n.d.; Moss, 2002), women's current personal, social and economic resources exerted direct positive effects on their mental and physical health and together, these resources mediated the relationship between the severity of past *IPV* and current health. Although the total indirect effects in each model were substantial and significant, no specific mediating paths emerged as significant on their own. This is not surprising given that resources in one domain shape, and are shaped by, resources in other domains, making it difficult to disentangle the impact of specific resources. Indeed, all three types of resources were substantially correlated ($r = 0.21$ – 0.46). We interpret this as reflecting the coherence of women's lives, reminding us that distinguishing among types of resources is largely an analytical exercise given that, in real life, they are experienced as intertwined.

These findings are also consistent with evolving theoretical perspectives that call for an intersectional understanding of women's health (Anderson, 2006; Nazim, 2005) and violence against women (Crenshaw, 1994; Hankivsky & Varcoe, 2007). Such an analysis draws attention to the ways in which structural and social conditions mutually construct one another to affect health (Denton, Prus, & Walters, 2004) suggesting that past abuse and

current resources must be simultaneously considered within the context of broader structural conditions.

These findings have important implications for practitioners and policy makers. Although it is impossible to erase women's abuse histories, services and policies directed at improving women's access to personal, social and economic resources after leaving may result in improvements in health. Few studies have tested interventions for women who are in the process of leaving an abusive partner (Wathen & MacMillan, 2003). However, the effectiveness of post-shelter advocacy in increasing women's capacity to access needed resources, improving social support and quality of life and reducing re-victimization has been demonstrated in a series of studies (Bybee & Sullivan, 2002; Sullivan, 2003; Sullivan & Bybee, 1999). The development and evaluation of health promotion interventions that support improve women's access to needed resources after leaving is an important area of future study (Ford-Gilboe et al., 2006).

Our findings reveal that the relative impact of *IPV* and women's collective resources varied for mental versus physical health. While the magnitude of direct and indirect effects was similar for mental health, the direct effect of *IPV* on physical health was 4 times as strong as the indirect effect. This suggests that different mechanisms may underlie the direct and indirect impact of *IPV* on mental versus physical health. It is possible that the stronger direct effect of *IPV* severity on physical health may reflect the way in which *IPV* was conceptualized and measured. Although indicators of non-physical abuse were used to measure *IPV* severity, the scoring of the *ISA* results in the highest scores for severity being assigned to those acts of abuse that result in most significant physical injury. This "injury bias" in the measurement of *IPV* may help to explain why severity of *IPV* would be more strongly associated with physical versus mental health. It is important to note that these injuries continue to adversely affect women's health long after their immediate occurrence and supposed healing.

Our findings reinforce the idea that social resources are important determinants of women's health after leaving. The degree of conflict inherent in social relationships has been a better predictor of health outcomes than perceived social support (Stewart & Tilden, 1995), yet the positive aspects of social relations have been emphasized in research, with little attention paid to the social conflict. During the crisis of leaving, social support has been positively associated with women's mental and physical health (Campbell et al., 1995; Humphreys et al., 2001), but social relations may be strained as those in the woman's network take sides with the abusive partner, make demands on the woman as a condition of receiving help or interfere with her ability to make her own decisions (Wuest et al., 2003). Our findings extend the literature by suggesting that both dimensions of social resources are theoretically important factors that shape the health of women after leaving. However, further research is needed to address the way in which these two dimensions of social resources affect each other and, ultimately, the impact on health outcomes.

The findings of this study suggest that women's economic resources directly affect their mental health but also mediate the relationship between *IPV* severity and health outcomes. Consistent with this finding, World Health Organization (2005) recently identified economic resources as key to eradicating violence against women and called for research that explores the causal associations between economic inequality, weak safety nets, unemployment and poverty. Programs and policies that help women acquire economic resources may be important supports for health, yet women face many barriers to finding and obtaining good jobs post-leaving, particularly if they have dependent children (Swanberg et al., 2005). *IPV* results in significant disability for some women, making employment difficult or impossible (Coker

et al., 2005). Thus, state-sponsored economic programs that are not tied to the ability to work or which incorporate specific provisions for abused women (Tolman & Rosen, 2001) are also critical resources for women's health after leaving.

Although there has been a shift from thinking about women as victims of abuse to considering how they are survivors, research and theory addressing women's resilience is in the early stages of development and lacks conceptual clarity. Consistent with the literature on women's resilience (Brodsky, 1999; O'Leary, 1998; Wagnild & Young, 1990), we contend that resilience reflects women's capacity to adapt, change and grow in the face of ongoing stress or adversity, both in terms of how they see the world and how they live it in. Although our findings suggest that women's resilience affects their health after leaving, the mechanisms underlying this effect are complex and require further study (Agaibi & Wilson, 2005). For women who have left abusive partners, developing a sense of control is foundational to surviving and positioning for the future (Ford-Gilboe et al., 2005). The effectiveness of capacity-building interventions that reinforce women's strengths and support their control over decisions may be the key to developing a research agenda designed to promote the health and quality of life of women who have left abusive partners.

Several strengths of this study contribute to its relevance for understanding the health of women exposed to IPV. Although convenience sampling was used, the sampling approach directly addressed two of the most significant critiques of existing research on the health consequences of IPV: an over-reliance on samples of women recruited from shelters (Carlson, McNutt, & Choi, 2003) and on samples of exclusively low income women (Sutherland et al., 2001). The use of a relatively diverse, community sample of women makes a unique contribution to the literature, allowing inferences to be made to a wider group of women who have left abusive partners. At the same time, the use of a convenience sample of volunteers suggests that caution be exercised in generalizing the study findings beyond samples of women with similar characteristics as those in the study (i.e. English-speaking Canadian women from diverse socioeconomic backgrounds). The determinants of health perspective which guided this study supported a comprehensive analysis of health in post-leaving period, with a particular focus on women's resources. Furthermore, although the data were collected concurrently, women's reports of the severity of past IPV add a longitudinal dimension, strengthening the evidence for causal associations between the variables. While recall bias is a potential threat to validity in this study, in general, lower recall of abuse is associated with longer recall periods (Yoshihama & Gillespie, 2002). By confining the period since leaving to a maximum of 3 years (average 20 months), the problem of recall bias was limited. Testing the model with longitudinal data will provide more definitive support for causation between the latent variables and enable an examination of how changes in women's exposure to violence and access to resources predict changes in health over time. Additional analyses that test causal associations among the resource variables in the theoretical model will provide a more nuanced understanding of the ways in which specific resources are implicated in women's health after leaving that is essential for informing both services and policies.

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