CRIME AND JUSTICE

Bulletin

Personal stress, financial stress and violence against women

Don Weatherburn

Aim: *The aim of this study was to explore the association between financial stress, personal stress, social support and violence against women.*

Method: *The study used data from the General Social Survey, a large nationally representative sample survey conducted by the Australian Bureau of Statistics in 2006. Logistic regression models were used to examine the association between financial stress, personal stress, social support and violence against women.*

Results: *The risk of actual or threatened violence was significantly higher for women who lack social support or who in the last 12 months have experienced financial stress or personal stressors such as divorce or separation, death of a family member/close friend, serious illness, serious accident, mental illness, serious disability, inability to get a job, involuntary loss of job and gambling problems. The risk of actual or threatened violence for a woman at the lowest levels of financial and social stress was 4 per cent. At the upper end of the financial stress distribution (but the lowest end of the personal stress distribution), that risk jumped to nearly 15 per cent. At the upper end of the financial and personal stress distributions, the risk of actual or threatened violence was 36 per cent. These effects held up after controlling for age, being a sole parent, having alcohol and/or drug problems, level of social support and level of personal autonomy.*

Conclusion: *Financial stress, personal stress and lack of social support are strong independent correlates of violence against women. Further research is necessary, however, to determine whether these factors are causes or consequences of violence against women.*

Keywords: *financial stress, personal stress, social support, violence against women*

INTRODUCTION

More than 100 women fall victim to homicide in Australia every year. The majority of these homicides are committed by persons known to the victim (e.g. intimate partners, parents or other family members) (Virueda & Payne, 2010). Female homicide, however, is just the tip of a much larger problem. In 2005 the Australian Bureau of Statistics Personal Safety Survey (Australian Bureau of Statistics, 2006a) estimated that 242,000 Australian adult women (3.1 per cent of Australian women aged 18 years and over) had been physically assaulted in the 12 months preceding the survey. The same survey estimated that more than 2.2 million women in Australia had been assaulted at least once since the age of 15.

A great deal of research has been conducted into the correlates of violence against women. Though the causal mechanisms are

unclear, the evidence strongly suggests that women are more likely to have been subjected to violence if they experienced violence as a child, if they are sole parents, if they live in a relationship where alcohol is a problem or if they have a partner who is domineering or controlling (Australian Bureau of Statistics, 1996; Australian Bureau of Statistics, 2006a; Coumarelos & Allen, 1998; Ferrante et al., 1996; Johnson, 1996; Johnson, Ollus, & Nevala, 2008; Mouzos & Makkai, 2004). The results of studies that have examined the relationship between economic and social variables and violence against women have been more mixed. Some find that the risk of violence is higher among women experiencing economic and personal stress (e.g. Benson, Fox, DeMaris, & Van Wyk, 2003; Cunradi, Caetano, & Schaefer, 2002; Lauritsen & Schaum, 2004; MacMillan & Gartner, 1999; Van Wyk, Benson, Fox, & DeMaris, 2003) and lower among women who can call on others for

practical and emotional support (Van Wyk et al. 2003). No study to date, however, seems to have examined the joint effects of personal stress, financial stress and social support while controlling for other important predictors of violence against women (e.g. sole parent family status, alcohol abuse, age, male controlling behaviour). This makes it difficult to tell whether the putative effects of financial, personal stress and social support are real or simply artefacts of their association with each other and/or with other omitted variables.

The Australian Bureau of Statistics (2006b) periodically conducts a representative sample survey of the Australian population known as the General Social Survey (GSS). The survey contains a question asking respondents whether in the last 12 months they have been victims of actual or threatened violence. Unlike other Australian crime victimisation surveys, it also contains a large number of questions dealing with financial stress, personal stress and social support. This data does not appear to have been analysed in a study of violence against women. The study reported in this bulletin used the GSS to examine the relationship between violence against women and financial stress, personal stress and social support. Financial stress was measured using a set of questions directed at assessing the capacity of respondents to meet basic daily financial obligations (e.g. payment of rent, mortgage repayments). Personal stress was measured using a set of questions designed to see whether the respondent over the previous 12 months has experienced divorce or separation, death of a family member/close friend, serious illness, serious accident, mental illness, serious disability, inability to get a job, involuntary loss of job and gambling problems. Social support was measured using a single question designed to ascertain whether the respondent could call on help outside the family in a crisis.

The aim of the study was to see whether these factors are associated with violence against women and whether that association persists when other relevant factors are taken into account. The GSS does not contain any information about the victim-offender relationship. It is therefore impossible to restrict our attention to a particular form of violence against women, such as intimate partner violence (IPV). There are two points worth noting about this. Firstly according to the ABS personal safety survey (Australian Bureau of Statistics 2006a) 78.1% of the Australian women who were assaulted in the preceding 12 months were assaulted by someone they knew. Thus while the assailants in most cases are not intimate partners, they either have or have had a close personal relationship with the offender. Secondly, if financial and personal stress are both causes and consequences of violence there is no reason to believe that the association between violence and stress is limited to women who are assaulted by intimate partners. We would expect to find higher levels of financial and/or personal stress among all victims of violence.

PAST RESEARCH

There are two reasons for expecting a close association between stress and violence against women. Firstly, women who experience violence are known to suffer a variety of adverse outcomes, including mental and physical illness and drug and alcohol abuse (Loxton, Schofield, Hussain, & Mishra, 2006; Taft, Watson, & Lee, 2004). Women who leave their partners also often experience a significant loss of income (Weston, 1986). Secondly, some scholars have argued that stress and frustration lead to violent behaviour (Berkowitz, 1989; Dollard, Doob, Miller, Mowrer & Sears, 1939; Fagan & Browne, 1994; Felson, 1992; Linsky, Bachman and Straus, 1995). Fagan and Browne (1994), for example, have argued that life transitions which cause economic distress are particularly important precipitating factors for violence directed at women with whom men share an intimate relationship.

FINANCIAL STRESS

Early findings on the relationship between financial stress and violence were mixed. Hotaling and Sugarman (1986) examined 97 'risk markers' drawn from 52 studies on husband to wife violence conducted between 1970 and 1985. Three of four studies in their review that examined the relationship between violence and income found that income was negatively related to violence. Two of three studies that examined the effect of (the husband's) unemployment on violence found it to be positively associated with intimate partner violence. Seven of nine studies that examined the effect of family income/social class found it to be inversely related to violence. A subsequent meta-analysis by the same authors (Hotaling & Sugarman, 1990) cast some doubt on whether socioeconomic status remained a significant correlate of violence but Straus and Gelles (1990) reported a strong association between the rate of marital violence and social and financial stress (Straus & Gelles, 1990, p. 192).

More recent studies have found a relationship between measures of financial stress and violence, even after controlling for a wide range of other important violence predictors (Benson et al., 2003; Cunradi et al., 2002; Fox, Benson, DeMaris, & Van Wyk, 2002; Lauritsen & Schaum, 2004; MacMillan & Gartner, 1999; Spriggs, Halpern, Herring & Schoenbach, 2009; Van Wyk et al., 2003). The relationship, however, has not always been clear or consistent.

MacMillan and Gartner (1999) found that women's labour force participation lowered the risk of spousal abuse when their male partners were also employed but increased the risk when their male partners were not employed. Johnson et al. (2008) found that low income predicted violence but the effect disappeared in a multivariate analysis controlling for respondent age, heavy drinking by male partners, partner's use of violence outside the home, partner's controlling or emotionally abusive behaviour

and victim experience of physical abuse as a child. Julian and McKendry (1993) found no relationship between household income and violence when comparing a sample of 42 male 'wife batterers' with a sample of 50 non-violent men. Mouzos and Makkai (2004) using Australian data from the International Violence Against Women Survey (IVAWS) found no relationship between violence and either (victim or offender) unemployment or household income. Johnson et al.'s (2008) analysis of the full IVAWS dataset revealed that the association between household income and violence held for some countries and not others.

In summary, while the bulk of evidence suggests a strong link between violence against women and financial stress, the evidence is neither clear nor consistent enough to put the issue beyond doubt.

SOCIAL STRESS

Compared with financial stress, the research literature examining the effects of personal stress on violence against women is comparatively small. Straus and Gelles (1990) used a stressful life event scale to examine the relationship between the level of personal stress in a relationship and the marital assault rate. Their scale was based on questions dealing with a large range of potential stressors, including disagreements with work colleagues; longer working hours; problems finding or keeping employment; death, illness and disability; problems with child-rearing; and troubles with police and/or courts. They found a significant association between personal stress and marital violence. The association was much stronger in relationships where men had either experienced violence as a child, saw violence as legitimate and believed husbands should 'have the final say'. The marital assault rate by men who believed the husband should have the final say, for example, was four times higher than among men who did not believe the husband should have the final say (Straus & Gelles, 1990, p. 183).

Cano and Vivian (2001) reviewed 17 studies that examined the relationship between life stressors and husband-to-wife violence. Thirteen of the studies found a strong relationship between these stressors and husband-to-wife violence. There were, however, notable exceptions. Mason and Blankenship (1987) found no association between life stressors and husband-to-wife violence in a study of 155 cohabiting or married undergraduates. Pan, Neidig and O'Leary (1994) found no relationship between work stress and violence in a sample of 11,830 military personnel. Cano and Vivian (2003) compared a clinic sample of 258 'maritally discordant couples' seeking therapy with a community sample of 54 happily married non-violent couples using a questionnaire that measured respondent experience of 37 life stressors in the previous year. They found that violent spouses reported significantly more stressors than non-violent spouses. The relationship disappeared, however, when controls were introduced for level of marital satisfaction.

Once again, then, while there is some evidence that personal stress is associated with a higher risk of violence against women, the evidence on this issue is not consistent.

SOCIAL SUPPORT

Studies of child abuse and neglect generally find that the risk of maltreatment is attenuated when caregivers have strong social supports (Weatherburn & Lind, 2001). Only a handful of quantitative studies have examined the effect of social support on violence against women. The results have been mixed. In a survey of 557 women conducted as part of a domestic violence-screening program, Carlson, McNutt, Choi and Rose (2002) found that both abused and non-abused women had similar levels of practical and emotional support outside the family. In contrast, using data from the 1994 National (US) Survey of Families and Households, Van Wyk et al. (2003) found that social support (as measured by frequency of a woman's contact with friends, family and relatives) reduced the risk of violence after controlling for race, disadvantage, financial stress, duration of relationship and marital status. Similar results were obtained in a survey of 1,212 women living in blue-collar work sites in North Carolina (Denham et al., 2007). Goodman, Dutton, Vankos and Weinfurt (2005) examined rates of re-abuse among 406 help-seeking African American women and found that social support acted as a protective factor for women who had no experience of serious violence but was not a protective factor for women with such experience. Interestingly, Agoff, Herrera and Castro (2007) found evidence that strong social ties in a context where violence is condoned contributes to violence rather than reduces it. The evidence on social support is too equivocal to draw any firm conclusions.

THE CURRENT STUDY

One limitation in many of the studies examined so far is that they have tended to measure economic stress via household income or employment status. In doing so, they tacitly assume that individuals on lower incomes and those who are unemployed experience more financial stress than those who are on higher incomes or who have a job. This may be true as a rough generalisation but the level of financial stress experienced by an individual depends not just on their income but also on their financial commitments and liabilities. A sole parent with two children and an income of $20,000 is likely to experience a great deal more financial stress than a person on the same income who lives with her parents and has no children. As Fox et al. (2002) point out, the adequacy of income is more a function of the income-to-needs ratio than a simple function of income. Poor measurement of financial stress may be one reason for the inconsistent results obtained in studies of the relationship between financial stress and violence.

A second limitation is that some studies treat income as a continuous rather than as a categorical variable. This is only reasonable where the relationship between income and the probability of violence is linear. There is good reason to doubt this. Benson et al. (2003) grouped respondents from the US National Survey of Families and Households into quartiles based on their score on a general disadvantage index. Over the first three quartiles there was no relationship between disadvantage and violence. In the last quartile, the rate of violence nearly doubled. They also compared objective and subjective measures of financial strain. Objective stress was measured by computing the ratio of household income to the poverty line. Subjective stress was measured by asking respondents whether they were satisfied with their finances and how often they worry about their income. When subjective and objective financial stress measures were included in a multivariate analysis controlling for age, education, alcohol/drug problems and social support, the objective measures ceased to be significant predictors of violence. The subjective measure, however, remained highly significant. This suggests that financial stress ought to be measured either subjectively or in terms reflective of the gap between income and expenditure.

A third problem with past research is that, while some studies involve large representative samples of women (e.g. Coumarelos & Allen, 1998; Johnson, 1996; Johnson et al., 2008; Lauritsen & Schaum, 2004; Loxton et al., 2006; Taft et al., 2004), many studies do not. Many use either small samples, non-representative samples or samples that are large but representative of a limited population, such as intimate partners (e.g. Straus & Gelles, 1990; Van Wyk et al., 2003).

A fourth problem is lack of adequate control for other things that might predict violence against women. Studies of the effects of financial stress, for example, rarely include any control for personal stress. Studies of the effect of personal stress, on the other hand, rarely include any control for financial stress. Inadequate control also clouds our interpretation of studies examining the impact of social support. No study seems to have examined the joint effects of personal stress, financial stress and social support while controlling for other important predictors of violence against women (e.g. sole parent family status, alcohol abuse, age, male controlling behaviour). This makes it difficult to tell whether the putative effects of financial, personal stress and social support are real or simply artefacts of their association with each other or with other omitted variables. Joint analysis of the relationship between financial stress, personal stress, social support and violence gets around this problem and also allows us to explore the possibility that financial stress, personal stress and social support interact in their effect on violence against women.

Given this backdrop, the two questions of most concern in the present study are:

1. Is there a relationship between financial stress and violence against women?

2. If so, is this relationship mediated by personal stress and/or social support?

The general strategy adopted to answer these questions is to conduct a series of regression analyses to see whether (after controlling for other factors) there is any association between becoming a victim of violence and being under financial stress, personal stress or unable to access social support. The next section of this bulletin describes the methods used to address these questions in more detail.

METHOD

DATA SOURCE

The data for the study are drawn from the General Social Survey (GSS) (Australian Bureau of Statistics, 2006b), which is a representative sample survey of the Australian population. Approximately 86.5 per cent of eligible households responded fully or adequately to the survey, yielding a total sample for the survey of 13,375 private dwellings. All (7,125) female respondents to the survey were included in this analysis. As noted earlier, the GSS does not contain information on the relationship between victim and offender. Past studies of violence against women in Australia (Australian Bureau of Statistics, 2006a), however, have shown that nearly 80 per cent of Australian women who were assaulted in the past 12 months were assaulted by someone they knew.

DEPENDENT VARIABLE

The GSS measure of violence is drawn from a question asking respondents whether in the previous 12 months they have been the victim of actual or threatened violence. The variable constructed from this question, which we label victim, was coded '1' if the respondent answered yes and '0' otherwise.

INDEPENDENT VARIABLES

The key independent variables in the study are financial stress (finstress), personal stress (pstress) and social support (socsupp).

The GSS measures financial stress by asking respondents a series of questions about what it calls 'cashflow' and 'dissaving' problems. Under the heading of 'cashflow' problems, respondents were asked whether (in the last 12 months) they had difficulties paying electricity gas or telephone bills on time, paying mortgage or rent payments on time, paying for car registration or insurance on time, or making minimum payments on credit cards; whether in the last twelve months they had pawned or sold something because cash was needed; gone without meals; been unable to heat their home; sought financial help from friends or family; and/or sought assistance from welfare/community organisations.

Under the heading 'dissaving' problems, respondents were asked whether (in the last 12 months) they had reduced home loan repayments; drawn on accumulated savings/deposits; increased the balance owing on credit cards by $1,000 or more; entered into a loan agreement with family/friends; taken out a personal loan; sold household goods or jewellery; sold shares, stocks or bonds and/or sold other assets. The GSS measure of financial stress is constructed by summing positive responses to each of the questions on cashflow and dissaving. The measure of finstress used here is identical to the ABS measure except that we group values of the ABS financial stress variable into four: '0 or 1'; '2 or 3'; '4 or 5' 'more than 5'. Financial stress is treated as a categorical variable because this avoids assuming that the relationship between financial stress and violence is linear.

The GSS measures personal stress by asking respondents whether they have experienced any of the following over the preceding 12 months: divorce or separation; death of a family member/close friend; serious illness; serious accident; alcohol or drug problems; mental illness; serious disability; inability to get a job; involuntary loss of job; witness to violence, abuse or violent crime; trouble with the police; and gambling problems. The ABS measure of personal stress is created by summing positive responses to all of these questions. The present study uses the same approach but some personal stressors examined by the ABS had to be excluded, either because they were separately measured (drug and alcohol problems)[1] or because of the risk that they may act as proxies for the dependent variable (whether the respondent was a witness to violence, whether the respondent had experienced abuse or violent crime and whether the respondent had problems with police). Personal stress in the current study was measured by summing the number of personal stressors experienced by a respondent from the following reduced list: divorce or separation; death of a family member/close friend; serious illness; serious accident; mental illness; serious disability; inability to get a job; involuntary loss of job; and gambling problems. Values of the measure of personal stress (pstress) were grouped into four categories ('0 or 1'; '2 or 3' '4 or 5' 'more than 5').

The GSS does not have a specific social support scale comparable to the scales it has for financial and social stress. It does have items on the respondent's social network (frequency of contact with family and friends) and friendships (e.g. whether the respondent has ex-household members she feels close to and can confide in) but the extent to which these social networks and friendships provide emotional and practical support is unclear. The only question that explicitly addresses the issue of social support is one which asks respondents whether they are able to get support in times of crisis from someone living outside the household. The question permits only two answers: 'yes' and 'no'. Preliminary analyses indicated that, whereas the network and friendship responses were unrelated to risk of violence, the

variable measuring social support (hereafter labelled socsupp) was strongly related. Respondents who reported being unable to get support were much more likely to have experience actual or threatened violence than respondents who were able to get support. This variable was therefore chosen as the measure of social support and coded '1' if the respondent reported being able to get support in times of crisis from someone outside the household and '0' otherwise.

CONTROLS

To be sure that any association between financial stress, personal stress, social support and violence against women is not an artefact of some other unmeasured factor, controls were introduced for other factors known to be related to violence against women. As noted in the introduction, women are known to be more at risk of violence if they are young, sole parents, live in a relationship where alcohol is a problem, have a partner who is domineering or controlling, or have experienced violence as a child. Some of these factors can be measured directly using the GSS, some can only be measured indirectly and one cannot be measured at all (viz. an individual's experience of violence as a child).

The GSS contains information on the age of respondents, whether they are sole parents and whether the respondent had experienced alcohol or drug problems in the last 12 months. The variable age was grouped into the following categories: 18-24, 25-34, 35-44 and 45+. Sole parent status (solepar) was coded '1' if the respondent was a sole parent and '0' otherwise. The variable measuring drug and/or alcohol problems (D&A) was coded '1' if a respondent reported having experienced drug and alcohol problems in the previous 12 months and '0' otherwise.

The GSS contains no question that directly measures male controlling behaviour but it does contain a question that asks respondents whether they feel able to have a say with family and friends on important issues. Women in relationships with controlling partners, family members or friends are not likely to feel comfortable raising questions with family and friends on important issues. This variable, which is labelled *autonomy* in this study, is used to capture a woman's sense of personal freedom in a relationship. It is '1' if a woman reported feeling mostly or always feeling able to have a say with family and friends on important issues.

We include one other control of particular relevance to Australia. Rates of assault are known to be substantially higher in the Northern Territory than in any other State of Australia (Australian Bureau of Statistics, 2011). This is probably because rates of violence against Indigenous women are much higher than among non-Indigenous women (Fitzgerald & Weatherburn, 2001) and the Northern Territory has a high proportion of Indigenous residents. The GSS contains no variable measuring a respondent's Indigenous status. To control for this 'Northern

Territory effect', therefore, a dummy variable (NT) was included that took the value '1' if the respondent resided in the Northern Territory and '0' otherwise.

ANALYSIS TECHNIQUE

The analysis began with an examination of the relationships between the probability of being a victim of violence and each of our independent and control variables. Four logistic regression models were then constructed.

In the first model, the likelihood of being a victim was regressed against the measures of financial and personal stress plus all control variables (respondent's age, whether respondent was a sole parent, whether the respondent had drug and alcohol problems, respondent 'autonomy' and whether respondent resided in the Northern Territory). This first model includes no interaction terms.

In the second, the likelihood of being a victim was initially regressed against the same variables plus an interaction term reflecting the joint effects of financial and personal stress. The aim in this part of the analysis was to see whether the effects of financial stress were exacerbated in the presence of personal stress. The number of respondents with both high personal and financial stress, however, turned out to be too low for reliable coefficient estimates to be obtained. The levels of financial and personal stress were therefore reduced to two (no stressor v one or more stressors) and the interaction term (finstress x pstress) was redefined as the product of these two modified variables. The likelihood of being a victim of violence was then regressed against finstress, pstress, finstress x pstress plus the control variables.

The third model was the same as model two, except that the interaction term finstress x pstress was removed and replaced with the interaction term finstress x socsupp, measuring the interaction between financial stress and social support. The aim here was to see whether social support reduced strength of the relationship between financial stress and violence.

The fourth model was the same as model three, except that the interaction term finstress x socsupp was replaced with a term pstress x socsupp measuring the interaction between personal stress and social support.

All analyses were conducted using SPSS version 17. All models were assessed using standard model-fit statistics (Hosmer-Lemeshow chi-square, AUC, Nagelkerke). High levels of multicollinearity (viz. high correlations among independent variables) can result in biased estimates of model parameters. Multicollinearity was assessed by running the logistic regression models as OLS regressions and inspecting standard diagnostic tests provided by SPSS in conjunction with such models.

RESULTS

Table 1 provides descriptive statistics for variables included in the study.

Table 1: Descriptive statistics for variables included in the study

Variable		Frequency	Percentage
age	18-24	611	8.6
	25-34	1,273	17.9
	35-44	1,501	21.1
	45+	3,740	52.5
NT	Northern Territory	667	9.4
	Elsewhere	6,458	90.6
D&A	Yes	704	9.9
	No	6,421	90.1
solepar	Yes	972	13.6
	No	6,153	86.4
autonomy	Never or rarely able to have a say	1,148	16.1
	Always of mostly able to have a say	5,977	83.9
finstress	0 or 1	5,709	80.1
	2 or 3	818	11.5
	4 or 5	344	4.8
	More than 5	254	3.6
pstress	0 or 1	5,257	73.8
	2 or 3	1,536	21.6
	4 or 5	197	2.8
	More than 5	135	1.9
socsupp	Yes	6,719	94.3
	No	406	5.7
victim	Yes	678	9.5
	No	6,447	90.5

Table 2 shows the association between the dependent variable and each of the independent variables included in the analysis. The percentage of respondents reporting that they had been victims of actual or threatened violence in the last 12 months is significantly higher for younger women, women living in the Northern Territory, women who have experienced drug and alcohol problems, women who are sole parents, women who feel they are never or rarely able to have a say with family and friends on important issues, women who have experienced a personal stress, women who have experienced higher levels of financial stress and women who lack social support.

Table 3 shows the association between the dependent variable and each of the personal stressors included in the composite personal stress variable.

Table 2. Bi-variate comparisons with victimisation

Variable		Victims (%)	*p*-value (χ^2)
age	18-24	18.0	<.001
	25-34	13.8	
	35-44	12.3	
	45+	5.6	
NT	Northern Territory	17.2	<.001
	Elsewhere	8.7	
D&A	Yes	28.7	<.001
	No	7.4	
solepar	Yes	23.6	<.001
	No	7.3	
autonomy	Never or rarely able to have a say	13.8	<.001
	Always of mostly able to have a say	8.7	
finstress	0 or 1	6.1	<.001
	2 or 3	17.1	
	4 or 5	26.7	
	More than 5	39.4	
pstress	0 or 1	7.1	<.001
	2 or 3	13.5	
	4 or 5	23.4	
	More than 5	37.8	
socsupp	Yes	9.1	<.001
	No	18.8	

Table 3. Personal stressors and victimisation

Variable		N	Victims (%)	*p*-value (χ^2)
Divorce or separation	No	6,160	8.1	<.001
	Yes	965	18.5	
Death of family member/ close friend	No	5,493	8.4	<.001
	Yes	1,632	13.3	
Serious illness	No	5,363	8.4	<.001
	Yes	1,762	12.9	
Serious accident	No	6,713	8.9	<.001
	Yes	412	20.1	
Mental illness	No	6,176	8.0	<.001
	Yes	949	19.5	
Serious disability	No	6,595	9.0	<.001
	Yes	530	15.8	
Inability to get a job	No	6,266	8.3	<.001
	Yes	859	18.4	
Involuntary loss of job	No	6,764	9.0	<.001
	Yes	361	18.6	
Gambling problems	No	6,901	8.9	<.001
	Yes	224	28.1	

The percentage of respondents reporting that they have been victims of actual or threatened violence in the last 12 months is significantly higher for women who in the last 12 months have experienced divorce or separation, death of a family member or close friend, a serious illness, a serious accident, mental illness, a serious disability, inability to get a job, involuntary loss of job and/or gambling problems.

Table 4 shows the results of regressing the probability of actual or threatened violence against all the variables shown in Table 2. The high Nagelkerke value and the AUC of .789 indicates that the model is acceptable (Hosmer & Lemeshow, 2000). The Hosmer Lemeshow test result is significant but this is not surprising given the large sample size. An examination of predicted versus observed frequencies revealed no evidence of any major departure. No problems of multicollinearity were encountered.

An odds ratio greater than one indicates that the variable in question increases the risk of actual or threatened violence

Table 4. Model with main effects only

Comparison	Parameter estimate	*p*-value	Odds ratio (with CI)
age		<.001	
25-34	-0.33	.025	0.72 (0.54-0.96)
35-44	-0.54	<.001	0.58 (0.44-0.78)
45+	-0.99	<.001	0.37 (0.28-0.49)
NT	0.61	<.001	1.84 (1.45-2.35)
D&A	1.05	<.001	2.86 (2.30-3.55)
solepar	0.97	<.001	2.65 (2.17-3.24)
autonomy	-0.29	.008	0.75 (0.60-0.93)
socsupp	-0.47	.004	0.63 (0.45-0.86)
finstress		<.001	
2 or 3	0.68	<.001	1.97 (1.57-2.49)
4 or 5	0.97	<.001	2.64 (1.97-3.51)
More than 5	1.38	<.001	3.96 (2.89-5.37)
pstress		<.001	
2 or 3	0.33	.001	1.40 (1.14-1.70)
4 or 5	0.51	<.012	1.66 (1.12-2.47)
More than 5	1.20	<.001	3.34 (2.18-5.10)
intercept	-2.34	<.001	N/A

AUC = .789, Hosmer Lemeshow = .004, Nagelkerke = .212

Table 5. Model with main effects only (excluding divorced or separated women)

Comparison	Parameter estimate	p-value	Odds ratio (with CI)
age		<.001	
25-34	-0.52	.001	0.56 (0.43-0.82)
35-44	-0.78	<.001	0.46 (0.33-0.63)
45+	-1.13	<.001	0.33 (0.24-0.44)
NT	0.72	<.001	2.06 (1.57-2.71)
D&A	1.10	<.001	2.99 (2.30-3.90)
solepar	0.88	<.001	2.42 (1.90-3.10)
autonomy	-0.29	.023	0.75 (0.59-0.96)
socsupp	-0.45	.014	0.64 (0.45-0.92)
finstress		<.001	
2 or 3	0.78	<.001	2.19 (1.70-2.83)
4 or 5	0.92	<.001	2.54 (1.77-3.58)
More than 5	1.34	<.001	3.81 (2.62-5.55)
pstress		<.001	
2 or 3	0.40	.001	1.49 (1.19-1.88)
4 or 5	0.43	<.085	1.54 (0.93-2.45)
More than 5	1.33	<.001	3.79 (2.18-6.61)
intercept	-2.69	<.001	N/A

AUC = .782, Hosmer Lemeshow < .01 Nagelkerke = .191

Table 6. Model with financial-personal stress interaction

Comparison	Parameter estimate	p-value	Odds ratio (with CI)
age		<.001	
25-34	-0.35	.014	0.70 (0.53-0.93)
35-44	-0.57	<.001	0.57 (0.43-0.75)
45+	-1.01	<.001	0.34 (0.26-0.44)
NT	0.60	<.001	1.82 (1.43-2.32)
D&A	1.19	<.001	3.27 (2.66-4.02)
solepar	1.02	<.001	2.76 (2.27-3.37)
autonomy	-0.32	.003	0.73 (0.59-0.90)
socsupp	-0.49	.002	0.61 (0.45-0.84)
finstress	0.43	<.010	1.54 (1.11-2.13)
pstress	0.45	.001	1.57 (1.20-2.11)
finstress x pstress	0.36	.069	1.43 (0.97-2.10)
intercept	-2.49	<.001	N/A

AUC = .784, Hosmer Lemeshow = .019, Nagelkerke = .198

against women. An odds ratio less than one indicates that the variable in question reduces the risk. The odds ratios in Table 4 indicate that financial and personal stress both have strong positive associations with the risk of violence against women, while social support has a negative association. It would be of considerable interest to know to what extent financial and personal stress are consequences of violence (or separation following violence) and to what extent they are causes of violence. This question cannot be resolved in a cross-sectional study but we can obtain some hints as to which way the causal relationship might run. If personal and financial stress is purely a result of violence and/or the separation/divorce that follows it, we might expect the odds ratios associated with financial and personal stress to diminish in magnitude or cease to be significant if we remove women from the sample who have experienced divorce or separation over the past 12 months. Table 5 shows the results of applying model 1 to such a sample.

There is no systematic trend toward lower odds ratios when recently divorced or separated women are absent from the sample. The odds ratio for social support remains almost unchanged. The odds ratios for the lowest values of financial and personal stress and the highest value of personal stress are slightly higher. The odds ratios for the 4 to 5 financial and personal stress contrasts (relative to 0 or 1 stressors) are slightly lower.

Table 6 shows model 2, which tests for an interaction between financial and personal stress.

Comparing the odds ratios in Tables 4 and 6, it is evident that the main statistical effects of control variables are identical in sign and very similar in magnitude to the model that included only main effects. The odds ratio for interaction term (finstress x pstress) is greater than one, suggesting that the statistical effects of financial and personal stress might be multiplicative rather than additive (i.e. an interaction effect). The *p*-value for the interaction term, however, is slightly above the conventional five percent level of statistical significance. This suggests that if there is an interaction between financial stress and personal stress, it is not very strong.

Table 7 shows model 3, which tests for an interaction between financial stress and social support. The control variables all have the correct signs and are significant – however neither the variable measuring the effect of financial stress or the variable measuring the interaction between financial stress and social support are significant. The variable measuring the effect of social support is only weakly significant.

Table 8 shows model 4, which tests for an interaction between personal stress and social support. The control variables all have the expected sign and are significant. The variable measuring social support (socsupp) is not significant. The interaction term (pstress x socsupp) is significant but this effect should be treated with caution as the confidence interval surrounding the odds ratio is very large and tests showed evidence of multicollinearity.

Table 7. Model with financial stress-social support interaction

| Comparison	Parameter estimate	p-value	Odds ratio (with CI)
age		<.001	
25-34	-0.35	.015	0.70 (0.53-0.93)
35-44	-0.57	<.001	0.57 (0.43-0.75)
45+	-1.01	<.001	0.34 (0.26-0.44)
NT	0.60	<.001	1.82 (1.43-2.31)
D&A	1.19	<.001	3.27 (2.67-4.02)
solepar	1.01	<.001	2.75 (2.27-3.35)
autonomy	-0.32	.003	0.73 (0.59-0.90)
socsupp	-0.53	.050	0.59 (0.35-1.00)
finstress	0.56	.389	1.74 (0.49-6.19)
pstress	0.63	.001	1.89 (1.55-2.29)
finstress x socsupp	0.07	.843	1.07 (0.56-2.01)
intercept	-2.49	<.001	N/A

AUC = .780, Hosmer Lemeshow = .066, Nagelkerke = .197

Table 8. Model with personal stress-social support interaction

Comparison	Parameter estimate	p-value	Odds ratio (with CI)
age		<.001	
25-34	-.470	<.001	0.63 (0.52-0.75)
35-44	-.682	<.001	0.51 (0.42-0.61)
45+	-1.226	<.001	0.29 (0.25-0.35)
NT	.493	<.001	1.64 (1.39-1.92)
D&A	1.090	<.001	2.97 (2.57-3.44)
solepar	.651	<.001	1.92 (1.63-2.26)
autonomy	-.198	.007	0.82 (0.71-0.95)
socsupp	-.108	.566	0.89 (0.62-1.29)
finstress	.574	<.001	1.78 (1.58-1.99)
pstress	1.004	<.001	2.73 (1.79-4.18)
pstress x socsupp	-.479	.034	0.62 (0.39-0.96)
intercept	-2.503	<.001	0.082

AUC = .780, Hosmer Lemeshow = .126, Nagelkerke = .198

Figure 1. Risk of assault by financial and personal stress
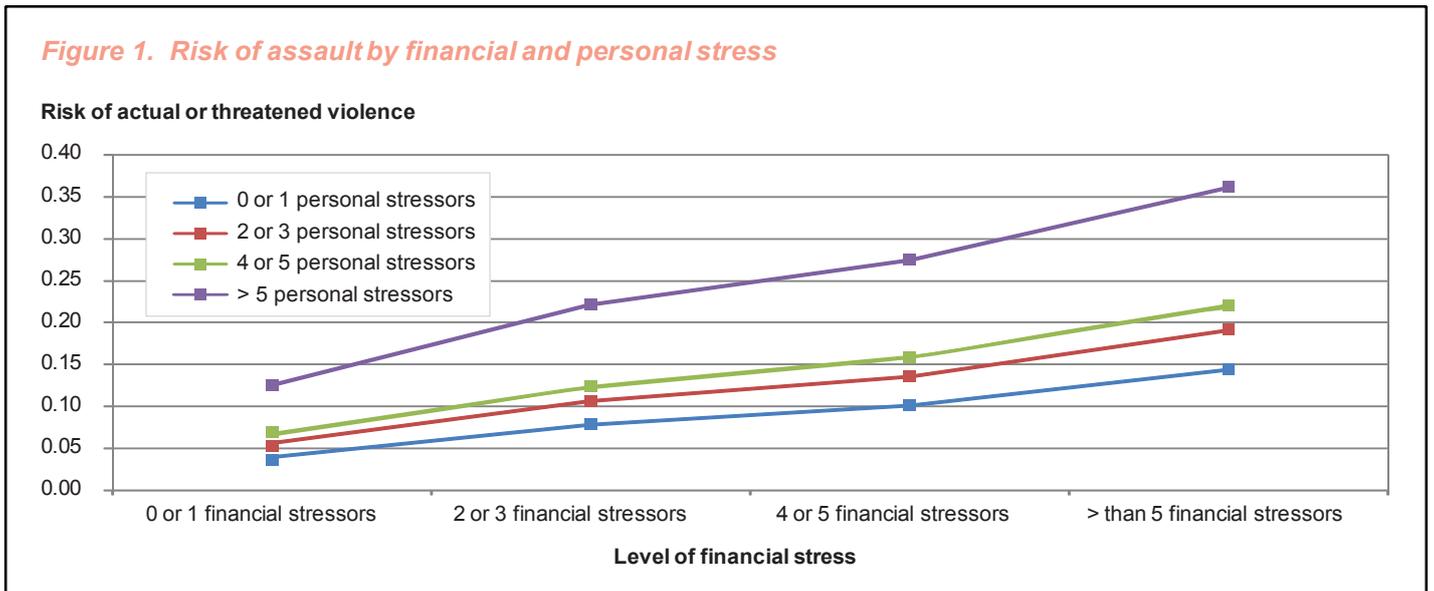
Finally, to illustrate the joint effects of financial stress and personal stress, Figure 1 shows the marginal effect on risk of actual or threatened assault of changes in the level of financial stress and personal stress. The base case for these comparisons is a respondent aged 25-34 who lives outside the Northern Territory, who has no drug or alcohol problems, is not a sole parent and who feels able to have a say with family and friends on important issues.

There is clearly a strong relationship between the probability of actual or threatened violence and the number of financial stressors at each level of the personal stress variable. The risk of actual or threatened violence for a woman at the lowest levels of financial and social stress is 4 per cent. At the upper end of the financial stress distribution (but the lowest end of the personal stress distribution, that risk jumps to nearly 15 per cent. At the upper end of the financial and personal stress distributions, the risk of actual or threatened violence is 36 per cent.

DISCUSSION

The aim of this study was to answer two questions of interest about violence against women:

1. Is there a relationship between financial stress and violence against women?

2. If so, then is this relationship mediated by personal stress and/or social support?

The results indicate that higher levels of financial and personal stress are strongly associated with an increased risk of violence against women, even after controlling for age, location (of residence), drug and alcohol problems, parental status (sole parent vs other) and personal autonomy. In the median (most common) case, the risk of actual or threatened violence is about four per cent. The corresponding risk at the top end of the financial or personal stress distribution is three to four times higher. These results are consistent with the findings of MacMillan & Gartner (1999), Cunradi et al. (2002), Van Wyk et al. (2003), Benson et al. (2003) and Lauritsen & Schaum (2004).

There is some (albeit highly tentative) evidence of an interaction between violence against women, financial stress and personal stress. The correlation between financial stress and actual or threatened violence appears more pronounced among those who are exposed to high levels of personal stress and vice versa. There is also some (but, again, highly tentative) evidence of an interaction between violence, personal stress and social support, whereby risk of violence is higher among women exposed to personal stress and where they have no social support to draw upon. There is no evidence, on the other hand, that the association between violence and financial stress is affected by whether or not the victim has social support.

The present study has three significant limitations that need to be acknowledged. The principal limitation of the study is that it is cross sectional in nature. This makes it impossible to resolve questions about cause and effect. A second limitation is that some of the variables used to control for known correlates of violence (e.g. male controlling behaviour, social support) are less than ideal. A final limitation is that, while we know from other Australian surveys that the vast majority of women are assaulted by someone they know, in the present case we cannot separate violence inflicted by strangers from violence inflicted by persons known to the victim. These are significant limitations but they need to be weighed against the fact that this is the first time the effects of financial and personal stress have been shown to hold up in the presence of each other and in the presence of a range of other controls, including social support, age, drug and alcohol abuse, respondent autonomy and family structure (i.e. sole parent family vs other). Our results show that the relationship between violence, financial stress, personal stress and social support remains strong even after adjusting for these factors

and even after removing women from the sample who have experienced divorce or separation over the last 12 months.

There are two (mutually compatible) ways of interpreting these findings. The first is to suppose that financial and personal stress increase the risk of violence against women, while social support buffers that risk. This explanation makes sense if we assume that the conditions which victims report as having affected them (e.g. financial stress) also affected their assailants, either directly or through their effects on the pattern of interactions between victim and offender. There is some evidence to support this. In their study of intimate partner violence (IPV) in a New Zealand birth cohort of 828 men and women assessed at age 25, Fergusson, Boden and Horwood, (2008) noted that the predictors of IPV perpetration were 'strikingly similar' to those of IPV victimisation. Those correlates included family economic circumstances, exposure to abuse in childhood, parental use of physical punishment, inter-parental violence and parental drug/ alcohol use.

The alternative explanation is that women who experience violence are more likely (as a consequence) to experience financial and personal stress and/or more likely to lack social support. This explanation is also plausible. Women who experience intimate partner violence are known to suffer a variety of adverse physical and mental health outcomes, including mental and physical illness and drug and alcohol abuse (Loxton et al., 2006; Taft et al., 2004). These problems alone may generate financial stress but even if they do not, separation often produces a substantial fall in female income. (Weston, 1986).

Although it is impossible to test causal relationships in a cross-sectional study, there are reasons for doubting that the causal pathway runs solely from violence to financial stress, personal stress and lack of social support. To begin with, 75 per cent of the women who reported having been victims of violence in the preceding 12 months said that they had not experienced divorce or separation over this period. Secondly, as we saw earlier, when respondents who had been divorced or separated over the last 12 months were excluded from the analysis, the effects of financial stress, personal stress and social support held up. Thirdly, the risk of violence was not just higher for women experiencing financial stress. The risk increases more or less linearly with the level of financial stress (see Figure 1). It is easy to see why divorce and separation would result in victims of violence being more financially stressed on average than non-victims. If the association between financial stress and violence is just a consequence of women experiencing financial stress after leaving violent relationships, it is hard to understand why risk of violence increases progressively with the level of financial stress.

Given the qualifications surrounding the present results it is impossible to draw firm conclusions regarding their significance for violence prevention policy. To make effective use of the current findings we need to determine which way the causal effects in the stress-support-violence relationship actually run. If financial and personal stress increase the risk of violence against women and social support attenuates that risk, the provision of social support may help prevent violence against women. If, on the other hand, financial stress, personal stress and lack of social support are all consequences of violence against women, victim support services may need to be strengthened to address these problems. The task of unravelling the causal relationships is part theoretical and part empirical. The theoretical challenge is, as Lori Heise (1998) pointed out more than a decade ago, to move beyond single factor theories toward explanations that reflect 'the full complexity and messiness of real life (Heise, 1998, p. 262). That will require integrated explanations for violence against women incorporating multiple factors operating at different levels (see Johnson & Dawson, 2011). It may also require different explanations for different forms of violence against women (e.g. violence by men toward their partners, violence against women by other women).

The empirical challenge is to find better ways of testing these integrated theories. In Australia this will require a shift away from investment in multi-purpose cross-sectional surveys such as the GSS toward investment in longitudinal surveys specifically designed to test hypotheses about the cause and effects of violence against women. Only in longitudinal surveys can we properly determine the causal order of the events we are trying to explain. It may also require a shift in focus from surveys of victims of violence to surveys of domestic violence offenders. In most studies of violence against women we are trying to understand its causes indirectly; through the experiences and characteristics of their victims.

ACKNOWLEDGEMENTS

NOTES

1   Drug and alcohol problems were measured separately because to have included them in the measure of personal stressors might not have provided adequate control for their effects.

REFERENCES

Agoff, C., Herrera, C., & Castro, R. (2007). The weakness of family ties and their perpetuating effects on gender violence: A qualitative study in Mexico. *Violence Against Women*, *13*(11), 1206-1220.

Australian Bureau of Statistics (1996). *Women's safety Australia 1996*. (ABS Cat. No. 4128.0). Canberra: Australian Bureau of Statistics.

Australian Bureau of Statistics (2006a). *Personal Safety Survey Australia*. (ABS Cat. No. 4906.0). Canberra: Australian Bureau of Statistics.

Australian Bureau of Statistics (2006b). *General Social Survey*. (ABS Cat. No. 4159.0). Canberra: Australian Bureau of Statistics.

Australian Bureau of Statistics (2011). *Crime victimisation Australia, 2009-10*. (ABS Cat. No. 4530.0). Canberra: Australian Bureau of Statistics.

Benson, M.L., Fox, G.L., DeMaris, A., & Van Wyk, J. (2003). Neighbourhood disadvantage, individual economic distress and violence against women in intimate relationships. *Journal of Quantitative Criminology*, *19*(3), 207-235.

Berkowitz, L. (1989). The frustration-aggression hypothesis: An examination and reformulation. *Psychological Bulletin*, *106*, 104-122.

Cano, A., & Vivian, D. (2001). Life stressors and husband-to-wife violence. *Aggression and Violent Behaviour*, *6*, 459-480.

Cano, A., & Vivian, D. (2003). Are life stressors associated with marital violence? *Journal of Family Psychology*, *17*(3), 302-314.

Carlson, B.E., McNutt, A., Choi, D., & Rose, I. (2002). Intimate partner abuse and mental health. *Violence Against Women*, *8*(6), 720-745.

Coumarelos, C., & Allen, J. (1998), Predicting violence against women: The 1996 Women's Safety Survey. *Crime and Justice Bulletin* (No. 42). Sydney: NSW Bureau of Crime Statistics and Research.

Cunradi, C.B., Caetano, R., & Schafer, J. (2002). Socioeconomic predictors of intimate partner violence among white, black, & Hispanic couples in the United States. *Journal of Family Violence*, *17*(4), 377-389.

Denham, A.C., Frasier, P.Y., Hooten, E.G., Newton, W., Gonzalez, P., Begum, M., & Campbell, M.K. (2007). Intimate partner violence among Latinas in Eastern North Carolina. *Violence Against Women*, *13*(2), 123-140.

Dollard, J., Doob, L.W., Miller, N.E., Mowrer, O., & Sears, R.R. (1939). *Frustration and aggression*. New Haven: Yale University Press.

Fagan, J., & Browne, A. (1994). Violence between spouses and intimates: Physical aggression between men and women

in intimate relationships. In A.J. Reiss, Jr. and J.A. Roth (Eds.), *Understanding and preventing violence*. Washington D.C.: National Academy Press, pp. 115-192.

Felson, R.B. (1992). 'Kick 'em when they're down': Explanations of the relationship between stress and interpersonal aggression and violence. *The Sociological Quarterly*, *33*(1), 1-16.

Fergusson, D.M., Boden, J.M., & Horwood, L.J. (2008). Developmental antecedents of interpartner violence in a New Zealand birth cohort. *Journal of Family Violence* 23, 737-753.

Ferrante, A., Morgan, F., Indermaur, D., & Harding, R. (1996). *Measuring the extent of domestic violence*. Sydney: The Hawkins Press.

Fitzgerald, J., & Weatherburn, D. (2001). Aboriginal victimisation and offending: The picture from police records. *Bureau Brief* (No. 17). Sydney: NSW Bureau of Crime Statistics and Research.

Fox, G.L., Benson, M.L., DeMaris, A.A., & Van Wyk, J. (2002). Economic distress and intimate violence: Testing family stress and resources theories. *Journal of Marriage and Family*, *64*(3), 793-807.

Goodman, L., Dutton, M.A., Vankos, N., & Weinfurt, K. (2005). Women's resources and use of strategies as risk and protective factors for re-abuse over time. *Violence Against Women*, *11*, 311-336.

Heise, L. (1998). Violence against women: An integrated, ecological framework. *Violence Against Women*, *4*(3), 262-290.

Hosmer, D.W., & Lemeshow, S. (2000). *Applied logistic regression.* Second Edition. NJ: John Wiley & Sons.

Hotaling, G.T., & Sugarman, D.B. (1986). An analysis of risk markers in husband to wife violence: The current state of knowlege. *Violence and Victims*, *1*(2), 101-123.

Hotaling, G.T., & Sugarman, D.B. (1990). A risk marker analysis of assaulted wives. *Journal of Family Violence*, *5*(1), 1-13.

Johnson, H. (1996). *Dangerous domains: Violence against women in Canada.* Toronto: Nelson Canada.

Johnson, H., & Dawson, M. (2011). Violence against women in Canada: Research and policy perspectives. Toronto: Oxford University Press.

Johnson, H., Ollus, N., & Nevala, S. (2008). *Violence against women: An international perspective*. New York: Springer.

Julian, T.W., & McKendry, P.C. (1993). Mediators of male violence toward female intimates. *Journal of Family Violence*, *8*(1), 39-55.

Lauritsen, J.L., & Schaum, R.J. (2004). The social ecology of violence against women. *Criminology*, *24*(2), 323-357.

Linsky, A.S., Bachman, R., & Straus, M.A. (1995). *Stress, culture and aggression*. New Haven: Yale University Press.

Loxton, D., Schofield, M., Hussain, R., & Mishra G. (2006). History of domestic violence and physical health in midlife. *Violence Against Women*, *12*(8), 715-731.

MacMillan, R., & Gartner, R. (1999). When she brings home the bacon: Labor-force participation and the risk of spousal violence against women. *Journal of Marriage and the Family*, *61*, 947-958.

Mason, A., & Blankenship, V. (1987). Power and affiliation: Motivation, stress, and abuse in intimate relationships. *Journal of Personality and Social Psychology*, *52*, 203-210.

Mouzos, J., & Makkai, T. (2004). Women's experiences of male violence: Findings from the Australian component of the International Violence Against Women Survey (IVAWS). *Research and Public Policy Series* (No. 56). Canberra: Australian Institute of Criminology.

Pan, H.S., Neidig, P.H., & O'Leary, K.D. (1994). Predicting middle and severe husband-to-wife physical aggression. *Journal of Consulting and Clinical Psychology*, *62*, 975-981.

Spriggs, A.L., Halpern, C.T., Herring, A.H., & Schoenbach, V.J. (2009). Family and school socioeconomic disadvantage: Interactive influences on adolescent dating violence victimisation. *Social Science and Medicine, 68*, 1956-1965.

Straus, M.A. & Gelles, R.J. (1990). *Physical violence in American families, risk factors and adaptations to violence in 8,145 families*. New Brunswick, New Jersey: Transaction Publishers.

Taft, A.J., Watson, L.F., & Lee, C. (2004). Violence against young Australian women and association with reproductive events: A cross sectional analysis of a national population sample. *Australian and New Zealand Journal of Public Health, 28*(4), 324-329.

Van Wyk, J.A., Benson, M.L., Fox, G., & DeMaris, A. (2003). Detangling individual-, partner- and community-level correlates of intimate partner violence. *Crime and Delinquency*, *49*(3), 412-448.

Virueda, M., & Payne, J. (2010). *Homicide in Australia: 2007-08 National Homicide Monitoring Program annual report*. Canberra: Australian Institute of Criminology.

Weatherburn, D., & Lind, B. (2001). *Delinquent-prone communities*. Cambridge: Cambridge University Press.

Weston, R. (1986). Changes in household income circumstances. In P. McDonald (Ed.), *Settling up: Property and income distribution on divorce in Australia*. Sydney: Prentice Hall.