



Does adolescent's exposure to parental intimate partner conflict and violence predict psychological distress and substance use in young adulthood? A longitudinal study

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ABSTRACT

Little is known about the extent to which parental conflict and violence differentially impact on offspring mental health and substance use. Using data from a longitudinal birth cohort study this paper examines: whether offspring exposure to parental intimate partner violence (involving physical violence which may include conflicts and/or disagreements) or parental intimate partner conflict (conflicting interactions and disagreements only) are associated with offspring depression, anxiety and substance use in early adulthood (at age 21); and whether these associations are independent of maternal background, depression and anxiety and substance use. Data ($n = 2,126$ women and children) were taken from a large-scale Australian birth-cohort study, the Mater University of Queensland Study of Pregnancy (MUSP). IPC and IPV were measured at the 14-year follow-up. Offspring mental health outcomes – depression, anxiety and substance use were assessed at the 21-year follow-up using the Composite International Diagnostic Interview (CIDI). Offspring of women experiencing IPV at the 14-year follow-up were more likely to manifest anxiety, nicotine, alcohol and cannabis disorders by the 21-year follow-up. These associations remained after adjustment for maternal anxiety, depression, and other potential confounders. Unlike males who experience anxiety disorders after exposure to IPV, females experience depressive and alcohol use disorders. IPV predicts offspring increased levels of substance abuse and dependence in young adulthood. Gender differences suggest differential impact.

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Introduction

Does adolescent's exposure to parental intimate partner conflict and violence predict psychological distress and substance use in young adulthood? A longitudinal study on parental intimate partner conflict (IPC) and violence (IPV) is not uncommon. UNICEF has estimated that between 133 million and 275 million children around the world witness frequent parental intimate partner conflict and or violence each year (Pinheiro, 2006). IPC generally involves arguments and/or disagreements

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with verbal expressions which contribute visible evidence of these disagreements to offspring. Routine communications and interactions are generally affected, for example one partner may leave the home for a period of time. IPV, by contrast, involves observable physical violence such as one partner striking the other. Such violence is often accompanied by interactions which include conflict and disagreements. A study from a nationally representative sample in the United States estimated that about 1 in 4 women and 1 in 7 men had experienced IPV in their lifetime (Breiding, Black, & Ryan, 2008). An earlier Australian population study found that 23% of women had ever experienced IPV (Mulroney, 2003), with perhaps 60% of these women having children in their care, and that some 66% of these children had witnessed the violence (Linacre, 2007). Although a recent study conducted among convenience samples of university students in 15 nations found that males and females were almost equally likely to perpetrate intimate partner violence, especially in North America (Straus & Michel-Smith, 2013), other studies suggest that the prevalence of male perpetrated IPV is much higher and more severe than the prevalence and severity of female perpetrated violence (Feder & MacMillan, 2012; Halford, Farrugia, Lizzio, & Wilson, 2010; MacMillan & Wathen, 2014; Tjaden & Thoennes, 2000). Our study focuses on the consequences for offspring of parental IPV against the mother using maternal reports of male-partner violence toward them.

In the context of increasing concern about the consequences of parental IPV on offspring (Paterson, Taylor, Schluter, & Lusitini, 2013), a number of questions remain to be resolved. Firstly do IPV and non-violent Inter-partner Conflict (IPC) have similar consequences for offspring outcomes? Secondly, to what extent is the association between IPV, IPC and offspring mental health a result of confounding? A variety of social and demographic factors may confound the association between IPV, IPC and offspring mental health and behavior, including teenage pregnancy, poverty/socioeconomic disadvantage, maternal mental health and alcohol use by caregivers (Fergusson, Horwood, & Ridder, 2005; Gilbert, El-Bassel, Chang, Wu, & Roy, 2012). Finally, relatively few previous studies have been able to resolve alternative cause-effect sequences. Thus, it is plausible that early onset of child mental health and behavior problems may lead to IPV or IPC rather than the reverse being the case. There is a need to test a causal sequence using a prospective cohort design (Kitzmann, Gaylord, Holt, & Kenny, 2003).

Life Course Stage and Witnessing IPC

It is not known whether there are critical or sensitive periods for the child's exposure to IPV. Child behavior manifests marked changes particularly around the period of pubertal development (Najman et al., 2008) and post pubertal offspring health may be affected by the witnessing of marital conflict and/or violence during this stage of development. Focusing on young adult mental health and behavior outcomes in a causal model is also likely to provide a better prediction of adult life course trajectories than assessing pre-pubertal outcomes. In addition, large-scale population-based prospective studies using diagnostic measures of outcome are rare (Fergusson, Boden, & Horwood, 2008) and no previous such studies have addressed the question of whether adolescent exposure to IPV predicts young adult outcomes. The current study will compare the impact of offspring exposure to parental non-violent intimate partner conflict (IPC) and intimate partner violence (IPV) in adolescence (child age 14 years); as these predict offspring mental health and substance use at 21 years of age using DSM-IV measures of outcome.

Consequences of IPC Versus IPV

Growing-up in a home characterized by ongoing non-violent conflict, whether or not it is accompanied by divorce, is associated with greater psychological distress and lower levels of well-being in young adulthood (Amato & Sobolewski, 2001; Turner & Kopiec, 2006). These outcomes have been largely reported in cross sectional designs (Kim, Jackson, Conrad, & Hunter, 2008). We have been unable to find specific studies assessing the possibility of differential outcomes when the child is exposed to IPV compared to children experiencing IPC.

Exposure to IPV in Adolescence

IPV is arguably a severe form of IPC (Martinez-Torteya, Bogat, von Eye, & Levendosky, 2009). There is some evidence to suggest that IPV impacts on offspring may be manifested in aggression, substance use, emotional withdrawal, attention problems, and psychiatric symptoms (Harris, Lieberman, & Marans, 2007; Nayak, Lown, Bond, & Greenfield, 2012; Turner & Kopiec, 2006; van der Kolk, 2005). Moreover, these negative consequences may be carried into offspring adulthood and affect the offspring's broader social environment (Harris et al., 2007; Lieberman, Chu, Van Horn, & Harris, 2011).

There is a dearth of longitudinal studies of the effects of IPV on adolescent offspring. Among longitudinal studies that were conducted on adolescents – one longitudinal U.S. national survey among adolescents ages 12–17 ($N=3,614$ at wave 1) examined whether exposure to IPV at wave 1 was associated with posttraumatic symptoms, delinquency, depression and binge drinking in wave 2 and 3 conducted about 1 and 2 years later respectively. Exposure to IPV at wave 1 was associated with offspring depression, delinquent acts and binge drinking at wave 3 (Cisler et al., 2012). Similarly, another study conducted by the same research group using the latter dataset found associations between children experiencing physical abuse, sexual assault, witnessing inter-parental conflict or community violence at wave 1 and substance use at wave 2 some 15 months later (Begle et al., 2011). However, the analyses aggregated all types of victimization together. Despite these findings it is generally the case that there are few studies using longitudinal design assessing the impact of IPV on adolescents, and to our best knowledge, none that have followed adolescents into young adulthood. In addition, while most studies which have

examined the effect of IPV on children and adolescents used self-report or mother report scales (usually Child Behavior Check-list; CBCL, see for example, [Howell, 2011](#); [Lamers-Winkelman, Willemen, & Visser, 2012](#)), the present study uses structured clinical interviews based on DSM criteria to assess the young adults depression, anxiety and substance use.

Exploring Gender Differences in the Consequences of IPC and IPV

The impact of parental IPV and IPC on offspring may differ by gender. While many studies have controlled for gender, very few studies have examined gender differences directly. Studies that have assessed gender differences do not report on gender differences or have not found significant differences ([Kitzmann et al., 2003](#); [Lamers-Winkelman et al., 2012](#); [Wolfe, Crooks, Lee, McIntyre-Smith, & Jaffe, 2003](#)). Two recent studies have examined gender differences in the context of child exposure to family violence. One was based on longitudinal data from the Project on Human Development in Chicago Neighborhoods including 1,421 adolescents aged 16–22 (wave III of this study) who were 10–16 years when family conflict was assessed (wave I) ([Skeer et al., 2011](#)). The main dependent variable was substance use and dependence. For males, living in families with high levels of conflict was not a risk factor for either substance use or symptoms of anxiety or depression while for females, living in families with high conflict was associated with conduct problems and substance use and dependence ([Skeer et al., 2011](#)). In contrast, a U.S. nationally representative sample of 3,614 adolescents aged 12–17 years which examined gender differences in outcomes following the witnessing of IPV found males were more affected than females ([Begle et al., 2011](#)). There remains a need to explore gender differences in offspring outcomes of IPC and IPV directly.

Contextual Confounders in the Associations Between IPV, IPC and Early Adult Mental Health

Exposure to domestic violence is associated with an increased rate of symptoms of anxiety and depression for the victim of violence ([Fergusson et al., 2005](#); [Gao et al., 2010](#); [Lindhorst & Beadnell, 2011](#); [Straus & Mickey, 2012](#)). The severity of the negative consequences of IPV on children may depend upon the extent to which the mother shows symptoms of depression and anxiety and whether she succeeds in being supportive to her child ([Howell, 2011](#); [Renner & Boel-Studt, 2013](#)). For example, Holmes recent study using secondary data analysis from the National Survey of Child and Adolescent Well-Being (NSCAW) found that inter-parental violence was associated with maternal poor mental health, i.e., major depressive episodes, heavy alcohol use, and substance use in the past year, which in turn was significantly associated with child's (ages 3–8 years) aggressive behavior ([Holmes, 2013](#)). Regardless of IPC or IPV, prenatal smoking is associated with offspring externalizing and internalizing problems at childhood and adolescence even after controlling for numerous covariates ([Ashford, van Lier, Timmermans, Cuijpers, & Koot, 2008](#)). Thus, while there might be a direct association between offspring exposure to parental IPV and/or IPC and their emotional and behavioral distress ([Yoo & Huang, 2012](#)), the impact of IPV or IPC on offspring may be in part mediated by maternal distress ([Renner & Boel-Studt, 2013](#)), prenatal smoking ([Wakschlag, Pickett, Kasza, & Loeber, 2006](#)), maternal substance use ([Skeer, McCormick, Normand, Buka, & Gilman, 2009](#); [Skeer et al., 2011](#)), family structure (single versus intact families) and low income ([Turner, Finkelhor, Hamby, & Shattuck, 2013](#)). These potential confounders should therefore be controlled when examining the effects of experiencing IPC or IPV in adolescence, on the offspring psychological and SUDs in early adulthood.

In summary, little is known about whether IPV (mainly domestic violence) and IPC have similar consequences on offspring mental health problems and substance (licit and illicit) using behaviors. No previous studies have examined the possibility that the consequences of IPV may differ from those associated with IPC. Much of the available research is cross sectional rather than longitudinal and does not adequately control for a range of potential confounders. Finally there is a need to determine whether there are gender differences in the impact of IPC and IPV on offspring.

Research Questions

1. Is offspring exposure to parental IPV or IPC in adolescence (age 14) associated with offspring depression, anxiety and substance use in early adulthood (at age 21)?
2. Are associations between offspring exposure to parental IPV or IPC in adolescence and subsequent anxiety, depression and substance use independent of maternal background, depression and anxiety and substance use?
3. Are the consequences of adolescent exposure to parental IPV greater than the effects of exposure to IPC?
4. Are the associations between offspring exposure to IPV or IPC in adolescence and subsequent anxiety, depression or substance use in early adulthood differ by gender?

Methods

Data are taken from a large-scale and long running birth cohort study, the Mater-University of Queensland Study of Pregnancy (MUSP) and its outcomes. Briefly, some 8,556 consecutive pregnant women were approached at their first clinic visit over the period 1981–1983 and invited to participate in the study. The cohort consists of 7,223 live singleton babies who were not adopted out and their 6,703 mothers ([Fischer, Najman, Williams, & Clavarino, 2012](#)). These mothers and their children were followed up 3–5 days after the birth and then at 6 months, 5, 14 and 21 years. For this paper IPC and IPV in the past year are measured at the 14-year follow-up, and child mental health outcomes are assessed at the 21-year

follow-up (more details are in [Najman et al., 2005](#)). This study is based on data from 2,126 mothers and their children. Because of limited funding the Composite International Diagnostic Interview (CIDI II) was only administered to some 2,600 respondents. Because of non-response to earlier phases of data collection there is a further decline sample numbers. We have undertaken extensive analyses of the impact of loss to follow-up on our findings (see [Najman et al., 2005](#)) and generally find that loss to follow-up has the impact of providing conservative estimates of the true likely association. This is because those lost to follow-up are disproportionately the most disadvantaged and emotionally impaired respondents in the study. In the sample available for analysis 1,561 (73.4%) did not report IPC or IPV; 404 (19.0%) reported parental IPC, and 161 (7.6%) reported parental IPV.

Measurement

Parental intimate partner conflict (IPC). IPC was measured using seven items from the Spanier ([Spanier, 1976](#)) Dyadic Adjustment Scale (DAS). The scale includes items like “how often do you and your partner leave home after “a fight?” At the 14-year follow-up $\alpha = .88$.

Parental intimate partner violence (IPV). IPV in the past year was measured at the 14-year follow-up, using seven items. The first four items asked about whether during a disagreement with their partner any of the following had occurred; (he) threw something at you, pushed, grabbed or shoved you, tried to hit you, hit you; and then there were additional questions about whether, after a disagreement with their male partner, they had been physically hurt, had needed medical attention or they had called the police. These items are similar to items included in other studies of domestic violence (e.g., [Hegarty, Hindmarsh, & Gilles, 2000](#)). The $\alpha = .80$ for these seven items. While the cut-off for “caseness” is somewhat arbitrary, in the context of the sample we have available for analysis we have categorized the highest decile of scores as being in a violent relationship. To meet this standard, respondents had to report that at least two of the above had occurred.

Offspring depression, anxiety and substance abuse. Offspring depression, anxiety and substance use at age 21 were measured using the Composite International Diagnostic Interview ([World Health Organization, 1992](#)) administered by trained interviewers. The CIDI-Auto is a structured diagnostic interview that can produce DSM-IV and ICD-10 diagnosis for mental health problems and substance abuse and dependence. The CIDI has high concurrent validity ([McLaughlin et al., 2012](#)).

Confounding variables. Maternal age and maternal marital status in pregnancy were self-report at the first clinic visit. Mean family income categories were reported by respondents at each phase of data collection (seven categories) from categories provided. Respondents were grouped into two categories: experiencing poverty over the first five years after the birth of the baby or not. Maternal anxiety and depression was measured by the seven item subscale of the Delusions Symptoms State Inventory ([Bedford & Foulds, 1977](#)). We also sought self-reports for maternal smoking, alcohol use and cannabis use in pregnancy.

Results

Table 1 shows that poor maternal mental health (anxiety and depression) are both strongly associated with IPC and IPV. While these data are all obtained at the 14yr follow-up, the likely causal sequence is that conflict and violence predict poor maternal mental health ([Holmes, 2013](#); [Huang, Wang, & Warrener, 2010](#); [Zarling et al., 2013](#)). Women who experienced IPC were an estimated 4.43 times more likely to meet the DSSI criteria for depression and, for IPV were 7.64 times more likely to be depressed. Women who had experienced IPV at the 14-year follow-up were substantially more likely to have been teenage mothers (2.49 times), to be non-married at the time of recruitment and to have been living in poverty over the first five years after the birth (4.28 times). Women reporting IPV were also more likely to be both smoking tobacco and using cannabis in pregnancy.

Table 2 provides details on the association between maternal reports of IPC and IPV at the 14-year follow-up and offspring CIDI DSM-IV diagnostic mental illness outcomes at the 21-year follow-up. Offspring who are exposed to parental IPC or IPV are more likely to subsequently experience a lifetime ever cannabis use disorder. However, while the effect of IPC on cannabis use disorder diminishes after adjustment for maternal background (age, marital status in pregnancy and income – adjustment b), the effect of IPV on cannabis use disorder maintains after adjustment for maternal anxiety and depression, background, and substance use in pregnancy (adjustment c). Offspring who are exposed to parental IPV are also more likely to subsequently experience depression and anxiety disorder, nicotine and alcohol use disorders. However, the effect of offspring exposure to IPV on subsequent depression diminishes after adjustment for maternal depression and anxiety (adjustment a).

In **Table 3** we examine the previous associations separately for male and female offspring. For young adult male offspring exposure to parental IPV at 14 years of age is associated with anxiety disorder, nicotine and cannabis use disorders. These effects remain after adjustment for maternal anxiety and depression, background, and substance use in pregnancy (adjustment c). For young adult female offspring, exposure to IPV at 14 years of age is associated with alcohol and cannabis disorders and these effects remain after adjustment for maternal anxiety and depression, background, and substance use in pregnancy (adjustment c). Female offspring exposure to IPV is also associated with depression disorder but only in the unadjusted model. While male offspring exposure to IPC at 14 years of age is not associated with any mental health or substance use disorders that were measured in the present study, female offspring exposure to IPC is associated with subsequent cannabis and other illicit drug use after adjustment for maternal anxiety and depression, background, and substance

Table 1
Associations between maternal characteristics and parental intimate partner conflict (IPC) and Intimate Partner Violence (IPV).

		IPC		IPV	
		OR (95% CI)	% within each category	OR (95% CI)	% within each category
No inter-parental conflict		1		1	
Maternal socio-demographic characteristics					
Maternal age in pregnancy	13–19 (n=619)	0.89 (0.58; 1.35)	17.4	2.49 (1.29; 4.80)**	14.5
	20–34 (n=3,609)	0.91 (0.62; 1.32)	19.3	1.13 (0.60; 2.12)	7.1
	35+ (n=176)	1	21.0	1	6.3
Marital status in pregnancy	Single (n=340)	1.18 (0.88; 1.58)	19.1	2.95 (2.16; 4.02)**	17.9
	Separated/Widowed/Divorced (n=66)	1.43 (0.77; 2.65)	21.2	3.81 (2.04; 7.12)**	21.2
	Married/Living together (n=3,965)	1	19.0	1	7.1
Mean family income (annual) – first five years	Consist Poverty (n=128)	1.20 (0.71; 2.05)	17.2	4.28 (2.28; 8.06)**	18.0
	Mid Income (n=2,873)	1.22 (0.94; 1.60)	19.7	1.54 (0.98; 2.42)	7.3
	High Income (n=437)	1	17.2	1	5.0
Maternal depression at 14 yrs	Depressed (n=321)	4.43 (3.40; 5.78)**	38.0	7.64 (5.61; 10.40)**	25.2
	Non depressed (n=4,078)	1	17.6	1	6.8
Maternal anxiety at 14 yrs	Anxious (n=775)	3.36 (2.81; 4.03)**	33.9	4.27 (3.36; 5.43)**	16.9
	Non anxious (n=3,622)	1	16.0	1	6.3
Maternal lifestyle in pregnancy					
Maternal smoking in last trimester	Yes (n=1,613)	1.19 (1.02; 1.39)*	20.2	1.77 (1.42; 2.20)**	10.8
	No (n=2,777)	1	18.5	1	6.6
Maternal alcohol use in last trimester	Yes (n=1,607)	1.05 (0.90; 1.23)	19.7	0.92 (0.73; 1.16)	7.7
	No (n=2,779)	1	18.7	1	8.4
Maternal cannabis use in last trimester	Yes (n=84)	1.58 (0.92; 2.71)	22.6	3.88 (2.25; 6.69)**	22.6
	No (n=4,300)	1	19.1	1	7.8

Note. OR = odds ratio; CI = confidence interval.

* p < .05.

** p < .01.

use in pregnancy (adjustment c). Female offspring exposure to IPC is also associated with depression disorder but only in the unadjusted model.

Discussion

The present study has examined adolescents' exposure to parental IPC and IPV and their subsequent mental health and substance use in young adulthood. Four research questions were addressed. For the first research question we find that offspring exposure to IPV in adolescence predicts anxiety and substance use in young adulthood, and in response to the

Table 2
Prediction of DSM-IV offspring mental health and substance abuse at 21 years by parental intimate partner conflict (IPC) and Intimate Partner Violence (IPV): unadjusted and adjusted models.^{a,b,c}

	Unadjusted coefficient (n=2,126)		Adjusted coefficient ^a (n=2,118)		Adjusted coefficient ^b (n=1,692)		Adjusted coefficient ^c (n=1,685)	
	IPC (14 yr) (N=161)	IPV (14 yr) (N=404)	IPC (14 yr) (N=161)	IPV (14 yr) (N=404)	IPC (14 yr) (N=125)	IPV (14 yr) (N=324)	IPC (14 yr) (N=123)	IPV (14 yr) (N=323)
Offspring mental health	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Depression (lifetime)	1.28 (0.99; 1.66)	1.54 (1.07; 2.23)	1.15 (0.87; 1.52)	1.31 (0.88; 1.94)	1.14 (0.84; 1.56)	1.33 (0.85; 2.07)	1.16 (0.85; 1.58)	1.27 (0.81; 2.01)
Anxiety (lifetime)	1.11 (0.86; 1.43)	1.68 (1.18; 2.38)	1.01 (0.76; 1.34)	1.57 (1.07; 2.30)	1.13 (0.83; 1.54)	1.70 (1.10; 2.62)	1.15 (0.84; 1.57)	1.56 (1.00; 2.43)
Nicotine disorder (lifetime)	1.01 (0.74; 1.37)	1.82 (1.24; 2.68)	0.85 (0.63; 1.15)	1.58 (1.08; 2.31)	0.82 (0.57; 1.13)	1.71 (1.13; 2.61)	0.81 (0.58; 1.14)	1.62 (1.06; 2.49)
Alcohol disorder (lifetime)	1.26 (0.99; 1.60)	1.62 (1.15; 2.27)	1.12 (0.85; 1.47)	1.52 (1.03; 2.24)	1.18 (0.87; 1.60)	1.66 (1.07; 2.57)	1.18 (0.87; 1.61)	1.67 (1.07; 2.59)
Cannabis abuse and dependence (lifetime)	1.52 (1.18; 1.96)	1.99 (1.39; 2.84)	1.38 (1.05; 1.82)	1.89 (1.29; 2.76)	1.31 (0.96; 1.78)	2.11 (1.38; 3.22)	1.33 (0.97; 1.81)	2.16 (1.40; 3.31)
Other illicit drug abuse and dependence (lifetime)	1.35 (0.95; 1.93)	1.03 (0.58; 1.83)	1.25 (0.93; 1.68)	1.01 (0.63; 1.61)	1.27 (0.92; 1.77)	0.99 (0.58; 1.69)	1.28 (0.92; 1.78)	0.96 (0.56; 1.65)

Note. OR = odds ratio; CI = confidence interval. The bold values implicate significant Odd Ratios.

^a Adjusted for maternal depression and anxiety, offspring depression and anxiety, and maternal report on openness/problems family communication. All measures were taken when offspring was 14 years old.

^b Adjusted for (a) plus maternal age and marital status in pregnancy and income from child birth to 5 years.

^c Adjusted for (a) and (b) plus maternal smoking, alcohol use and cannabis use in pregnancy, last trimester.

* p < .05.

Table 3

Prediction of DSM-IV offspring mental health and substance abuse at 21 years by parental intimate partner conflict (IPC) and intimate partner violence (IPV): gender differences, unadjusted and adjusted models^c

	Males		Females		Males		Females	
	Unadjusted coefficient (n = 1,035)	IPV (14 yrs) (N = 404)	Unadjusted coefficient (n = 1,091)	IPV (14 yrs) (N = 404)	Adjusted coefficient ^c (n = 817)	IPV (14 yrs) (N = 324)	Adjusted coefficient ^c (n = 868)	IPV (14 yrs) (N = 323)
Offspring mental health	IPC (14 yrs) (N = 161) OR (95% CI)	IPV (14 yrs) (N = 404) OR (95% CI)	IPC (14 yrs) (N = 161) OR (95% CI)	IPV (14 yrs) (N = 404) OR (95% CI)	IPC (14 yrs) (N = 125) OR (95% CI)	IPV (14 yrs) (N = 324) OR (95% CI)	IPC (14 yrs) (N = 123) OR (95% CI)	IPV (14 yrs) (N = 323) OR (95% CI)
Depression (lifetime)	1.10 (0.71; 1.70)	1.30 (0.69; 2.44)	1.42 (1.02; 1.99) [*]	1.69 (1.06; 2.70) [*]	0.94 (0.58; 1.51)	1.25 (0.61; 2.56)	1.36 (0.89; 2.09)	1.24 (0.68; 2.27)
Anxiety (lifetime)	1.35 (0.87; 2.10)	2.68 (1.54; 4.68) [*]	1.02 (0.73; 1.41)	1.28 (0.81; 2.02)	1.56 (1.00; 2.43)	3.30 (1.80; 6.07) [*]	1.01 (0.65; 1.57)	0.95 (0.51; 1.77)
Nicotine disorder (lifetime)	1.08 (0.70; 1.68)	2.71 (1.59; 4.62) [*]	0.95 (0.62; 1.46)	1.22 (0.69; 2.17)	0.78 (0.48; 1.27)	2.59 (1.41; 4.78) [*]	0.83 (0.52; 1.34)	1.14 (0.62; 2.12)
Alcohol disorder (lifetime)	1.36 (0.99; 1.86)	1.32 (0.81; 2.13)	1.16 (0.77; 1.73)	2.27 (1.38; 3.74) [*]	1.13 (0.73; 1.74)	1.29 (0.64; 2.58)	1.32 (0.83; 2.10)	2.78 (1.59; 4.87) [*]
Cannabis abuse and dependence (lifetime)	1.32 (0.94; 1.85)	1.98 (1.21; 3.22) [*]	1.93 (1.29; 2.89) [*]	2.27 (1.32; 3.92) [*]	1.01 (0.65; 1.58)	2.17 (1.11; 4.24) [*]	1.95 (1.26; 3.01) [*]	2.83 (1.60; 4.98) [*]
Other illicit drug abuse and dependence (lifetime)	1.29 (0.80; 2.07)	0.75 (0.32; 1.78)	1.44 (0.83; 2.49)	1.44 (0.66; 3.15)	1.08 (0.67; 1.73)	0.59 (0.23; 1.49)	1.61 (1.01; 2.55) [*]	1.65 (0.86; 3.17)

Note. OR = odds ratio; CI = confidence interval. The bold values implicate significant Odd Ratios.

^c Adjusted for (a) and (b) (see Table 2), plus maternal smoking, alcohol use and cannabis use in pregnancy, last trimester.

^{*} $p < .05$.

second research question this remains the case after adjustment for possible confounders. These effects are similar to those observed in a few previous longitudinal studies that found that offspring exposure to IPV in childhood and adolescence is associated with offspring mental health problems and substance use in late adolescence or young adulthood (Cisler et al., 2012; Skeer et al., 2009). For the third question we find that exposure to IPV appears to have a greater impact than exposure to IPC. Finally, for the fourth research question we find gender differences in the outcomes of exposure to IPV and IPC.

Plausible interpretations of the findings are: IPV and substance use are comorbid and it is unclear which comes first (Catalano, 2012; Nowotny & Graves, 2013). IPV is more prevalent among substance users, and between 20% and 50% of all incidents of intimate partner violence occur when one or both partners are under the influence of alcohol or drugs (Hart, 2007). Thus, the higher rates of substance use among young adults' offspring who were exposed to IPV may reflect a parental role model of drug use rather than a result of the IPV per se. However, this explanation is unlikely as the associations between exposure to IPV and offspring substance use as young adult remain significant after maternal substance use was controlled. Moreover, it does not explain the associations between offspring exposure to IPV and their increased level of symptoms of anxiety.

A second explanation relies in the prism of IPV as a traumatic event (Cohen, Mannarino, & Iyengar, 2011). Witnessing violence may not be less traumatic than child's direct exposure to physical abuse, and the former shows similar negative consequences (Kitzmann et al., 2003; Sousa et al., 2011; Wright, Fagan, & Pinchevsky, 2013). The negative outcomes revealed among offspring in young adulthood in our study, especially the higher levels of substance abuse may reflect offspring efforts to cope with the trauma through self-medication (Darke, 2013; Khantzian, 1997). Two other mechanisms might explain the negative outcomes of IPV on offspring mental health and substance use: (a) exposure to IPV may reflect poor offspring self-regulation, i.e., the ability to managing expressions of emotions, enhancing positive emotions, and managing impulsive behaviors (Gross & Thompson, 2007). Children's exposure to IPV has been negatively associated with the ability to self-regulate negative emotions (Katz, Hessler, & Annest, 2007; Rigterink, Katz, & Hessler, 2010). Children's exposure to IPV is associated with increase negative affect including distress, fear, anger, and concern, as well as heightened emotional sensitivity to parental conflict (e.g., Davies, Myers, Cummings, & Heindel, 1999). Greater emotional distress, along with deficits in the ability to self-regulate distress, in the form of under controlled and over controlled emotional reactions play a role in the development of child internalizing and externalizing symptoms (Cummings, El-Sheikh, Kourou, & Buckhalt, 2009; Eisenberg & Sulik, 2012; Kitzmann et al., 2003) and substance use (Wong et al., 2013). For example, a recent study conducted among 132 children and their mothers who had been enrolled in a longitudinal study of parenting and children's social development found that children's emotional dysregulation proved to be a potent mediator of the associations between exposure to IPV and both internalizing and externalizing problems (Zarling et al., 2013). Thus the significant associations between offspring exposure to IPV and anxiety and substance use in young adulthood may reflect their heightened distress (anxiety) and a more limited ability to regulate (control) emotions and behavior (Bujarski et al., 2012; Wong et al., 2013).

(b) The second potential mechanism that may explain the associations between offspring exposure to IPV and their heightened anxiety and substance use involves maternal child rearing practices including warmth or acceptance, and maternal harsh or inconsistent discipline (Tajima, Herrenkohl, Moylan, & Derr, 2011). Maternal exposure to intimate partner violence may diminish a mother's parenting skills and/or commitment to parenting activities. Parenting practices are believed to be central to a child's positive growth and psychological adjustment (Garrido & Taussig, 2013; Holmes, 2013; Levendosky & Graham-Bermann, 2001; Rossman & Rea, 2005; Skopp, McDonald, Jouriles, & Rosenfield, 2007; Zarling et al., 2013). For

example, a study among 129 low-income African American mother–child (age 8–12) dyads revealed that children’s reports of both family cohesion and relatedness quality mediated the associations between IPV and children’s psychological adjustment (according to the CBCL; Owen, Thompson, Shaffer, Jackson, & Kaslow, 2009).

Gender differences in the consequences of exposure to IPV can also be interpreted through the self-medication hypothesis and theories of self-regulation. Specifically, among males, IPV is associated with anxiety, smoking and cannabis use – mostly indications of difficulties in self-regulation (Lorberg, Wilens, Martelon, Wong, & Parcell, 2010; Wilens, Martelon, Anderson, Shelley-Abrahamson, & Biederman, 2013). In females, exposure to IPV is associated with alcohol use similarly to findings reported by Smith, Elwyn, Ireland, and Thornberry (2010), cannabis, and to some extent with depression – indications of self-medication aiming to suppress negative feelings associated with the exposure to IPV (Dixon, Leen-Feldner, Ham, Feldner, & Lewis, 2009; Wong et al., 2013). The risk of this pattern is that it may lead to the intergeneration transmission of IPV, as couple substance use is a risk factor for intimate partner violence (Boden, Fergusson, & Horwood, 2012; Boden, Fergusson, & Horwood, 2013; Gilbert et al., 2012). Thus, our results raise the possibility that offspring exposed to IPV are experiencing the intergeneration transmission of intimate partner violence.

We find that offspring exposure to IPV has much stronger effects than offspring exposure to IPC. IPC however also impacts on female offspring (but not males), especially cannabis use and to some extent – depression. Gender differences might be explained through the way males and females derive their self-esteem. While both genders value relationships, males value independence while females value connections and interdependence (Josephs, Markus, & Tafarodi, 1992). When there is a threat of a breakup, males are more concerned with their social standing, while females are more concerned about the loss of connection (Kwang, Crockett, Sanchez, & Swann, 2013). Thus, when witnessing IPC, female offspring may mourn the potential or actual breakup of their parent couple relationships expressed through depressed feelings and substance use, while male offspring less often feel sorrow when responding to the loss of parental couple relationships.

Study Limitations

This study is one of the very few longitudinal studies examining effects of adolescents’ exposure to IPV and mental health and substance use in young adulthood. Mental health is assessed via clinical DSM diagnosis. Despite its strengths it has several limitations. First, our study did not address exposure to IPV in early childhood, thus the associations between offspring exposure to IPV in childhood and mental health in adulthood is unknown and might be even stronger than those found in current study. Second, other types of violence exposure were not measured. Given that IPV is correlated with child abuse and neglect (Hamby, Finkelhor, Turner, & Ormrod, 2010; Holmes, 2013), some of the effects found in this study might reflect general exposure to domestic violence rather than IPV. Third, our data does not include information about how long the relationship lasted, and whether the perpetrator was living in the home with the child. Fourth, the potential mechanisms that might explain the associations between IPV and offspring substance use and anxiety such as lack of parental acceptance and offspring rupture in self-regulation (Garrido & Taussig, 2013; Holmes, 2013; Rossman & Rea, 2005; Zarling et al., 2013) were not examined in this study. These limitations should be addressed in future studies.

Implications for Research and Practice

Research implications. The results emphasize the importance of longitudinal studies in the examination the effects of stressful events on offspring mental health. The study suggests differential effects of IPV compared with IPC, and differential impact by gender. The mechanisms that might explain the link between IPV and offspring anxiety and substance use, such as disruption associated with problems in self-regulation or as a self-medication should be further explored.

Clinical implications. Practitioners should take into account the long lasting impact of children exposure to IPV and plan psycho-social interventions as soon as IPV is disclosed. Prevention efforts can be based on public health models which see violence as an epidemic similar to an infectious disease. According to this model prevention efforts should include strategies for disseminating and implementing science-based parenting interventions that might mitigate the negative effects of IPV on offspring (Hammond, Whitaker, Lutzker, Mercy, & Chin, 2006).

Finally, studies show that mothers return to the violent intimate partner a mean of 5 times before permanently ending the violent relationships, often, for the sake of the children (Cohen et al., 2011; Sullivan & Bybee, 2004). Our findings show that children who are exposed to IPV, not only do not benefit from being raised in a home of two parents who are involved in violent conflictual relationships, but rather they develop long life negative consequences. This information should be shared in psycho-social counseling and treatment with women who are exposed to violent intimate relationships.

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