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Regular Article

Adolescents' internalizing symptoms predict dating violence victimization and perpetration 2 years later

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Abstract

The aim of this longitudinal study was to examine bidirectional associations of adolescents' internalizing symptoms with dating violence *victimization and perpetration*. We conducted secondary analyses of the Québec Longitudinal Study of Child Development data ($n = 974$). Each adolescent completed items from the Conflict Tactics Scale (at ages 15 and 17 years) to assess *psychological, physical, and sexual dating violence victimization and perpetration* in the past 12 months. Adolescents' symptoms of depression and general anxiety in the past 12 months were self-reported (at ages 15 and 17 years) using The Mental Health and Social Inadaptation Assessment for Adolescents. There were concurrent associations of adolescents' internalizing symptoms with dating violence *victimization and perpetration.* Internalizing symptoms at age 15 years were positively associated with dating violence *victimization* and *perpetration* 2 years later in both males and females, even after adjusting for baseline characteristics. However, neither dating violence victimization nor perpetration at age 15 years was associated with internalizing symptoms 2 years later. For males and females, internalizing symptoms put adolescents at risk for future dating violence *victimization and perpetration*. Interventions that target internalizing symptoms may have the potential to decrease subsequent dating violence.

Keywords: adolescents; dating violence; internalizing symptoms; perpetration; victimization

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Introduction

Adolescent dating violence is a significant risk factor for intimate partner violence and physical and mental health problems in adulthood (Exner-Cortens et al., 2013; Muñoz-Rivas et al., 2007). It can take different forms, including psychological/emotional (e.g., insulting, belittling), physical (e.g., hitting, pushing), and sexual (e.g., coercing a person into sex without their consent) violence (see Leen et al., 2013 for a review). Of particular concern is the finding from a meta-analysis showing that 20% of adolescents experience physical dating violence and 9% experience sexual dating violence (Wincentak et al., 2017). More than 60% of adolescents experience psychological dating violence (Taylor & Mumford, 2016). However, prevalence rates vary across studies (e.g., from 1% to 61% for physical dating violence) possibly due to differences in measurement (e.g., inclusion of a range of behaviors such as playfighting, minor and serious dating violence), time frame (e.g., minimum duration of relationship), or use of at-risk populations (e.g., prevalence rates of dating violence were higher among black and Hispanic adolescents) (Fernández-González et al., 2013; Vagi et al., 2015; Vezina & Hebert, 2007; Wincentak et al., 2017).

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Dating violence tends to begin and increase during adolescence (Foshee, 1996; Foshee et al., 2009). In a sample of 14–20-year-old youth, Fernández-González et al. (2014) found that psychological dating violence increased with age, physical dating violence reached its highest level between 16 to 17 years and showed a decline in late adolescence, and sexual violence was highest at 16 years. No consistent sex differences in the prevalence of physical and psychological dating violence have been reported, but the prevalence of sexual violence victimization is higher in girls than boys (see Leen et al., 2013 for a review). Also, girls are more likely to experience fear and intimidation, and more injuries and severe dating violence (Foshee, 1996; Molidor & Tolman, 1998; Reidy et al., 2016).

Although disparities in prevalence rates have been reported, a study showed that the prevalence of dating violence victimization (i.e., receiving violence; henceforth victimization) and perpetration (i.e., inflicting violence; henceforth perpetration) was 49% and 41%, respectively (Goncy et al., 2017; Haynie et al., 2013). Victimization and perpetration tend to co-exist, with 49% of adolescents being classified as both victims and perpetrators (Giordano et al., 2010; Olsen et al., 2010). Prior studies that used person-centered analyses indicate that youth can fall into distinct profiles or classes (Choi et al., 2017; Goncy et al., 2017; Reyes et al., 2017). As an example, Haynie et al. (2013) found that 65% of adolescents had not experienced or inflicted dating violence, 30% had

experienced and inflicted verbal violence, and 5% had experienced and inflicted both verbal and physical violence. Importantly, adolescents who fall into distinct profiles may experience different risks and mental health outcomes (Choi et al., 2017; Goncy et al., 2017; Reyes et al., 2017).

Prior work has found significant associations between adolescents' dating violence and internalizing symptoms, namely depression and anxiety (Banyard & Cross, 2008; Callahan et al., 2003; Wolitzky-Taylor et al., 2008). Such associations may be particularly strong as both dating violence and internalizing problems tend to peak in adolescence (Fernández-González et al., 2014; Hankin et al., 1998, Hankin et al., 2015). Hankin et al. (2015) found that depression rates were stable and ranged between 3%–5% among 8–14-year-olds, but increased up to 20% among 14–17-year-olds (Hankin et al., 2015). Girls were more likely to be depressed than boys and this sex difference peaked at 15–18 years (Avenevoli et al., 2015; Hankin et al., 1998, 2015). Similarly, studies that examined symptoms rather than diagnoses have provided support that both depression and anxiety symptoms increase during adolescence (Cohen et al., 2018; Kwong et al., 2019).

However, it is unclear yet how associations vary according to perpetration and victimization and all forms of dating violence. More importantly, most studies have not teased apart whether internalizing symptoms are a predictor or an outcome of dating violence in adolescence. It is likely that the association between internalizing symptoms and dating violence is bidirectional. In other words, internalizing symptoms may predict both dating violence victimization and perpetration, and, similarly, both victimization and perpetration may predict internalizing symptoms.

In support of the first hypothesis, a longitudinal study showed that adolescents with internalizing symptoms were more likely to experience victimization 1 year later (Smith et al., 2021). However, the study did not include sexual victimization and did not measure perpetration. Likewise, individuals with a diagnosis of depression prior to age 15 were at risk of experiencing dating victimization in early adulthood but depression was not associated with later perpetration (Keenan-Miller et al., 2007). As the study had no information on types of dating violence, it remains unclear whether effects occurred for specific types of victimization. Another study showed that girls with elevated depressive symptoms (mean age: 14.7; $SD = 2.08$) were six times more likely to perpetrate dating violence 2 years later (mean age 16.4; $SD = 2.03$) (McCloskey & Lichter, 2003). However, the study failed to examine sexual and physical perpetration and victimization. Overall, the findings of these studies corroborate with the stress generation hypothesis of depression, which argues that individuals experiencing depression (clinical diagnosis of depression and/or increased depressive symptoms) are more likely to behave in ways that generate stressful life events, in particular interpersonal ones (Hammen, 1991, 2006; Rudolph et al., 2000; Shih, 2006). The findings also corroborate with Coyne's interpersonal theory of depression, which argues that individuals with depression exhibit behaviors that may increase the risk of being rejected by others (e.g., interpersonal dependency, excessive reassurance seeking, interpersonal inhibition) (Coyne, 1976; Hames et al., 2013). Indeed, cognitive and interpersonal vulnerabilities (e.g., rumination, self-criticism, excessive reassurance seeking, interpersonal dependency) are prevalent among depressed adolescents and may compromise their romantic relationships (Hankin, 2006). Due to evocative person-environment transactions, depressed adolescents may be more likely to engage in maladaptive interactional patterns of behavior which may increase the risk of victimization and the experience of hostility and violence in intimate relationships. Other lines of research suggest that depressed adolescents may become perpetrators of dating violence as they "act out" their depressed mood (Yu et al., 2018). In a longitudinal study, Yu et al. (2017) found significant links between depression and aggression and argued that symptoms of depression that are more prevalent in adolescents (e.g., irritability, mood swings, temper tantrums) could mediate this association. Taken together, theories and empirical evidence indicate that depression can put adolescents at risk for victimization and perpetration.

With respect to the reverse association, it is worth noting that dating is a salient social milestone among adolescents, and that positive romantic relationships are associated with companionship, intimacy, competence, and growth opportunities (Collins, 2003; Collins & Sroufe, 1999). It makes sense, therefore, to suppose that the occurrence of victimization may become an interpersonal stressful event that negatively impacts an adolescent's mood (Hammen, 2006). This is in line with a couple and family discord model of depression, which highlights associations between problems in marriage/romantic relationships and partners' increased risk of depression (Beach, 2014). Victimization can contribute to depression as it may threaten an adolescent's need for acceptance and belonging, and the development of self as being worthy of love and a caring partner (Ayduk et al., 2001). Indeed, the broader literature on dating violence suggests that individuals who have experienced dating violence tend to blame themselves, and have reduced self-esteem and self-worth (see Shorey et al., 2008 for a review). Prior work has found that adolescents who were victims of dating violence reported greater depressive symptoms compared to adolescents who had not experienced dating violence (Ackard et al., 2007; Exner-Cortens et al., 2013). Significant associations have also been reported between adolescents' self-reports of victimization and symptoms of trauma and psychological distress (Jouriles et al., 2009, 2017). Moreover, adolescent perpetrators of psychological dating violence had increased self-reported symptoms of depression, anxiety, hostility, and emotion regulation difficulties (Shorey et al., 2011; Temple et al., 2016). Overall, the aforementioned research suggests that both victimization and perpetration can potentially predict internalizing problems in adolescents. However, those studies focused on either victimization (Ackard et al., 2007; Exner-Cortens et al., 2013; Jouriles et al., 2009, 2017) or perpetration (Shorey et al., 2011; Temple et al., 2016). Furthermore, they included only one or two types of dating violence (see Shorey et al., for exception) and did not consider in their analyses factors that could increase the risk of both dating violence and internalizing symptoms. Our study aimed to address these gaps.

It seems plausible that common pathways pertaining to parent, child, peer, and family-level factors could increase risk for both victimization or perpetration and internalizing symptoms. For the family-level factors, this is in line with the family systems theory, which posits that problems in the parental subsystem can spread among children (Minuchin, 1974). Indeed, prior studies have found that children of depressed mothers are at risk for perpetration and internalizing symptoms (Hammen et al., 2012; Keenan-Miller et al., 2007). Furthermore, the emotional security hypothesis argues that exposure to interparental conflict threatens children's felt security and impacts their adjustment and representations of relationships (Davies & Cummings, 1994). In line with this hypothesis, studies have found that exposure to violence between parents predicts intimate partner violence victimization and

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perpetration, and adolescent depression (Ehrensaft et al., 2003; Zinzow et al., 2009). Links have also emerged between peer and romantic relationships. Adolescents who are victimized by their peers are at increased risk for dating violence victimization (Smith et al., 2021; Zych et al., 2021). Furthermore, meta-analytic evidence suggests that internalizing symptoms are common among victimized children and adolescents and they can act as both a predictor and an outcome of peer victimization (Reijntjes et al., 2010).

Child characteristics are also influential. Adolescent girls are at higher risk of experiencing sexual violence victimization and have a two to three times higher risk of experiencing depression than boys (Avenevoli et al., 2015; Hankin et al., 1998, 2015; see Leen et al., 2013 for a review). However, studies have found mixed-sex effects in the association between adolescents' mental health outcomes and dating violence (Jouriles et al., 2017). Studies also show that lesbian, gay, and bisexual adolescents are at greater risk of dating violence victimization and perpetration and that they report higher levels of internalizing symptoms compared to heterosexual adolescents (Dank et al., 2014; Mustanski et al., 2016). Finally, the prevalence of dating violence perpetration and victimization and internalizing symptoms is higher among adolescents from low socioeconomic backgrounds (Goodman et al., 2003; Spriggs et al., 2009; Wincentak et al., 2017).

Using data from the Québec Longitudinal Study of Child Development (QLSCD), we examined bidirectional associations between adolescents' internalizing symptoms and victimization and perpetration. We postulate that (1) internalizing symptoms at age 15 years would predict subsequent victimization and perpetration at age 17 years and (2) victimization and perpetration at age 15 years would predict subsequent internalizing symptoms at age 17 years. Here, dating violence was conceptualized broadly and included psychological, physical, and sexual forms of dating violence. Prior work has indicated that adolescents who experienced more than one type of dating violence had worse mental health problems compared to adolescents who had experienced one type only (Choi et al., 2017; Exner-Cortens et al., 2013; Haynie et al., 2013; Vagi et al., 2015). On the basis of these findings, we examined bidirectional associations between exposure to dating violence and internalizing symptoms. Furthermore, we explored whether there were unique effects for types of dating violence. The adult literature suggests that psychological abuse had more adverse effects on abused women's mental health than sexual and physical abuse (Pico-Alfonso, 2005). Based on evidence that internalizing disorders are hierarchically organized, consisting of broader and narrower constructs (e.g., fear and distress) we ran the analyses using a composite score of internalizing symptoms and also separately for depression and anxiety – while controlling for the overlap – to isolate the unique variance of each (Kotov et al., 2017). Also, there is evidence indicating that adolescents who fall into distinct classes/profiles may be more vulnerable to anxiety than depression or vice versa. Choi et al. (2017) found that compared to adolescents who fell into the "forced sexual contact class" and a class of adolescents with no experience of dating violence, greater anxiety and depressive symptoms were found among adolescents who fell into the "emotional/verbal abuse" and "psychological abuse" classes. However, the "psychological and physical violence class" reported greater depressive symptoms only.

Based on previous evidence, we controlled for stability of the dependent variables and for factors that are associated with both adolescents' internalizing symptoms and dating violence, including adolescents' sexual orientation, prior internalizing symptoms and peer victimization, mothers' symptoms of depression and generalized anxiety and exposure to physical or psychological violence in other contexts, and family's socioeconomic status. We also controlled for victimization in the model estimating perpetration and vice versa because victimization and perpetration tend to co-occur (Giordano et al., 2010; Olsen et al., 2010). We also explored whether the associations are significantly different for boys and girls. However, given previous studies yielding mixed findings regarding sex moderation of the association between adolescents' mental health outcomes and dating violence, we made no a priori hypotheses about differential effects on boys versus girls (Jouriles et al., 2017).

Methods

Sample and procedure

The QLSCD is a large, ongoing, population-based birth cohort managed by the Institut de la Statistique du Québec (Québec Institute of Statistics; ISQ) in Canada. The cohort consists of 2,120 infants born in 1997/1998 and followed until now (see cohort profile for more information on the overall cohort: Orri et al. (2021)). Baseline characteristics were assessed repeatedly from 5 months to 13 years by trained research assistants during interviews held at participants' homes or via mailed questionnaires: sociodemographic characteristics (mother-reported), parental mental health (mother-reported), child characteristics (child, mother, father, and teacher-reported). Adolescents reported on their experiences of dating violence (victimization and perpetration) and internalizing symptoms via online questionnaires when they were 15 and 17 years old. Informed written consent was obtained by all participating families (and teachers) at each assessment point. Ethics were approved by the Health Research Ethics Committees of the ISQ and the Sainte-Justine Hospital Research Centre (Ethics Registration #2009-200 2762).

Analyses were based on 974 participants who had dating violence (victimization or perpetration) and internalizing symptoms data at ages 15 and 17 years (46% of the initial of $n = 2{,}120$). Distributions of baseline characteristics for participants included in the analysis vs excluded were comparable except for the following characteristics: participants in the analysis sample were more likely to be female, of European descent, come from a single-parent family, and have a mother who was exposed to physical or psychological violence compared to those in the larger sample (Table S1, available online). Inverse probability weights were therefore created by regressing the probability of being included in analyses on these variables and dividing 1 by the result to obtain weights representing the probability of being included in the analysis sample (Seaman & White, 2013).

Measures

Dating violence at 15 and 17 years

At 15 and 17 years, adolescents who reported having at least one boyfriend or girlfriend in the past 12 months were asked to indicate how often (*never, sometimes, often*) they had experienced or perpetrated different forms of dating violence in any of their relationships over the past 12 months. Eight items were taken from the short version of the Conflict Tactics Scale, which was validated in the Québec Health Survey of High School Students (ISQ, 2015) and assesses psychological (e.g., "I controlled their outings, their electronic conversations, their phone"; "I prevented them from seeing their friends"; two items), physical (e.g., "They hurt me with their fists, their feet, an object, or a weapon"; four items),

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and sexual (e.g., "They forced me to kiss or caress them when I did not want to"; two items) experiences and perpetrations of dating violence (Straus & Douglas, 2004). To examine whether exposure to dating violence was associated with internalizing symptoms, we created two binary (yes/no) variables at each age: (1) victimization, defined as experiencing any type of dating violence, at age 15 (Cronbach's alpha in this sample [α] = 0.77) or age 17 (α = 0.71) years and (2) perpetration, defined as perpetrating any type of dating violence, at age 15 (α = 0.80) or age 17 (α = 0.64) years. Associations of each subtype of victimization and perpetration with internalizing symptoms were examined in sensitivity analyses.

Internalizing symptoms at 15 and 17 years

The Mental Health and Social Inadaptation Assessment for Adolescents was used to assess DSM-5 based symptoms of depression and general anxiety (Côté et al., 2017). This measure has been validated in the QLSCD, with item-total scores correlations of 0.64 for depression and 0.56 for anxiety (Côté et al., 2017). Adolescents rated whether they experienced symptoms of depression (e.g., "I lost interest in things I usually like"; α = 0.85 at 15 years and 0.82 at 17 years, eight items) and general anxiety (e.g., "I found it difficult to control my worries; α = 0.87 at 15 years and 0.88 at 17 years, nine items) *never, sometimes,* or *often* over the past 12 months. We averaged these scores separately at 15 and 17 years (Pearson's r = .74 at 15 years and .73 at 17 years, p < .0001) to create a measure of internalizing symptoms (standardized on a 0–10 scale) where higher scores indicate more severe internalizing symptoms.

Covariates

We searched the literature for variables that could confound associations between dating violence and internalizing symptoms pertaining to child, parent, and family-level risk factors. Variables were included as covariates if they were correlated with at least one dating violence variable and internalizing symptoms at 15 or 17 years (Table S2). All covariates were assessed between 5 months and 13 years according to epidemiological guidelines for modeling longitudinal data, whereby covariates are selected at baseline to avoid the inclusion of variables which may lie on the mediation pathway between the exposure and outcome (Greenland & Morgenstern, 2001; Pearce & Greenland, 2005).

The following variables were included as covariates: childhood peer victimization (α = 0.65–0.81) and internalizing symptoms (α = 0.61–0.78) as reported by mothers, fathers, children, and teachers at ages 6, 7, 8-, 10-, 12-, and 13 years using items from the validated self-victimization and the Social Behaviour Questionnaire scales, respectively (Behar & Stringfield, 1974; Ladd & Kochenderfer-Ladd, 2002). Latent scores for both variables were created using the correlated traits-correlated (methods-minus-one) approach to maximize use of multi-informant reports across many time points (Papa et al., 2015). We also included adolescents' self-reported sexual orientation (asexual, bisexual, heterosexual, same sex; assessed at 15 years) as a covariate. Mean scores of maternal depressive symptoms in the past week (mother-reported when children were 5 months (α = 0.81), 1½ (α = 0.82), 3½ (α = 0.81), 5 (α = 0.82), 7 (α = 0.80), and 10 (α = 0.81) years) as assessed by the widely used Centre for Epidemiologic Studies Depression Scale (Radloff, 1977) and generalized anxiety symptoms in the past 12 months (mother-reported at child's ages 4.5 (α = 0.87) and 8 (α = 0.87) years) as assessed using a 10-item screening tool based on DSM-IV criteria and previously validated in the QLSCD (Shapiro et al., 2017), and maternal exposure to physical or psychological violence by a spouse/partner or someone important to them (mother-reported at child's ages 3½, 4½, 5, 8, 10, 12, and 13 years) were also included as covariates. Finally, a mean score of mother-reported family socioeconomic status (5 months, 1½, 3½, 5, 6, 7, 8, 10, 12, and 13 years) as derived from parental education and occupational status and household income, a validated measure from the National Longitudinal Study of Children (Willms & Shields, 1996), was included as a covariate. All covariates are described in Table 1.

Data analysis

Structural equation modeling was used to construct two cross-lagged models examining associations from 15 to 17 years between (1) victimization and internalizing symptoms and (2) perpetration and internalizing symptoms in Mplus version 8.6 (Muthén & Muthén, 2019). This enabled us to examine bidirectional effects between variables while controlling for the stability of each variable over time. First, we used a robust weighted least squares estimator (WLSMV; Muthén & Muthén, 2019) to estimate a model where dating victimization and internalizing symptoms at 17 years were regressed onto (1) victimization at 15 years, (2) internalizing symptoms at 15 years, (3) perpetration at 15 years, and (4) the interaction between victimization and perpetration at 15 years. Including this interaction term in the model enabled us to estimate the independent effect of victimization and examine whether perpetration moderated the effect of victimization (Giordano et al., 2010; Olsen et al., 2010). This model also accounted for the correlation between victimization and internalizing symptoms at 15 years and at 17 years.

Second, we adjusted for the aforementioned covariates in the model. Third, to examine the potential moderating role of sex, we performed a nested chi-square difference test to compare the fit of two models where we tested for differences in all associations between boys and girls. Specifically, using child's sex as a grouping variable, we ran a two-group model where all paths were constrained to be equal for boys and girls and compared its fit to another model where all paths were freely estimated for each sex (Kline, 2015). Models where paths were freely estimated for each sex were not superior in fit to models where paths were constrained to be equal across sexes (victimization and internalizing symptoms: χ^2_{12} = 11.28, p = .505; perpetration and internalizing symptoms: χ^2_{12} = 9.84, p = .630). All subsequent models were therefore estimated for boys and girls combined, with child's sex included as a covariate due to baseline sex differences in the prevalence of dating violence and level of internalizing symptoms.

Missing data in covariates (0.2%–2.6%) were handled using the full information maximum likelihood (Enders & Bandalos, 2001; Johnson & Young, 2011). Finally, we undertook two sets of sensitivity analyses. In the first, we re-estimated the cross-lagged models for depression and general anxiety symptoms separately to isolate the unique variance of each. Standardized residual variables at ages 15 and 17 years were used to control for the overlap between depression and general anxiety symptoms. These models were adjusted for the same variables as the models in the main analyses. In the second set of sensitivity analyses, we re-estimated the cross-lagged models for each subtype of victimization and perpetration separately to examine whether patterns of associations differed across subtypes. In addition to covariates, these models were adjusted for all victimization and perpetration subtypes at 15 years and included the interaction between a specific subtype of victimization and perpetration at 15 years in a given model (e.g., the

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Table 1. Baseline sample characteristics included as covariates in cross-lagged models[a]

		Skewness (*SE*[b])	Kurtosis (*SE*[b])	*n*
Participant				
Female, %	53.2	−0.13 (0.08)	−1.99 (0.16)	974
Same sex, bisexual, or asexual, %	9.1	0.88 (0.08)	−1.22 (0.16)	972
Peer victimization, *M*(*SD*)	0.00 (0.1)	0.30 (0.08)	−0.37 (0.16)	948
Internalizing symptoms, *M*(*SD*)	0.00 (0.04)	0.69 (0.08)	0.34 (0.16)	948
Parent				
Maternal depressive symptoms, *M*(*SD*)	1.37 (1.1)	1.16 (0.08)	1.14 (0.16)	974
Maternal anxiety, *M*(*SD*)	1.33 (1.1)	1.29 (0.08)	2.04 (0.16)	949
Maternal exposure to physical or psychological violence, %	45.2	0.19 (0.08)	−1.97 (0.16)	964
Family				
Socioeconomic status, *M*(*SD*)	−0.06 (0.9)	0.01 (0.08)	−0.35 (0.16)	974

Note. [a]Data were compiled from the final master file of the Québec Longitudinal Study of Child Development (1998–2015), © Gouvernement du Québec, Institut de la Statistique du Québec. [b]SE, standard error.

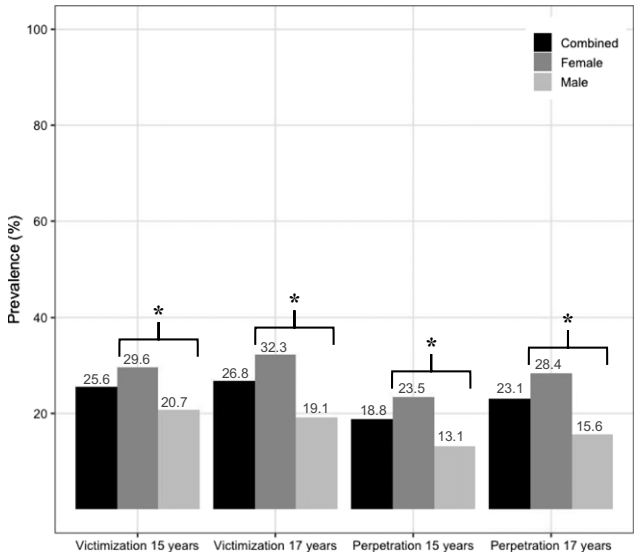

Figure 1. Prevalence of dating violence victimization and perpetration at 15 and 17 years[a]. [a]Data were compiled from the final master file of the Québec Longitudinal Study of Child Development (1998–2015), © Gouvernement du Québec, Institut de la Statistique du Québec. *$p < .05$.

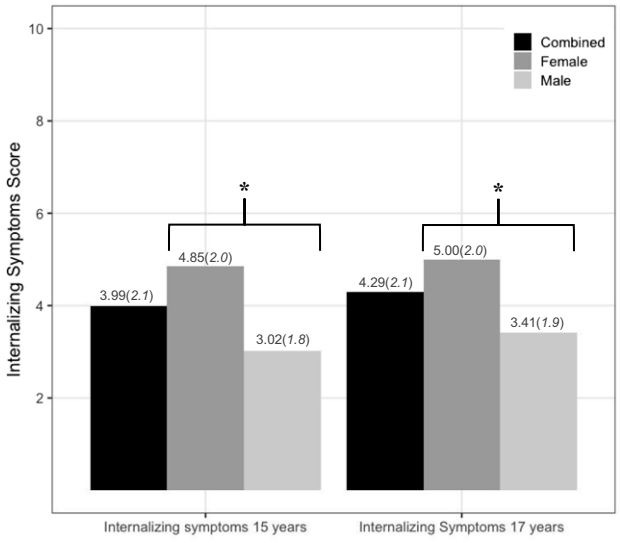

Figure 2. Internalizing symptoms scores at 15 and 17 years[a]. Mean (*standard deviation*). [a]Data were compiled from the final master file of the Québec Longitudinal Study of Child Development (1998–2015), © Gouvernement du Québec, Institut de la Statistique du Québec. *$p < .05$.

interaction between physical victimization and physical perpetration was included in the models for physical dating violence). Descriptive statistics and correlations were obtained using the Statistical Packages for the Social Sciences version 25 (IBM Corporation, 2018). The MplusAutomation package was used in R version 4.0.3 to prepare the data for use in Mplus (Hallquist & Wiley, 2018; R Core Team, 2019).

Results

Victimization and perpetration were prevalent in our analytic sample (Figure 1). Twenty-six percent and 27% of participants reported experiencing any type (psychological, physical, sexual) of dating violence at ages 15 and 17 years, respectively. Perpetration was less prevalent, with 19% and 23% of adolescents reporting having perpetrated any type of violence at 15 and 17 years, respectively. Both victimization and perpetration were significantly more prevalent in females than in males. A similar pattern was found for internalizing symptoms, with females reporting more severe internalizing symptoms than males at both 15 and 17 years (Figure 2). The prevalence of psychological and sexual victimization, as well as physical and psychological perpetration, was also higher in females compared to males (Figure S1).

Simple cross-lagged models – where we only adjusted for the interaction between victimization and perpetration at 15 years – showed that adolescent internalizing symptoms and perpetration were stable over time, and that victimization and perpetration were correlated with internalizing symptoms at both 15 and 17 years (Figure S2). In these models, internalizing symptoms at 15 years were positively associated with victimization and perpetration at

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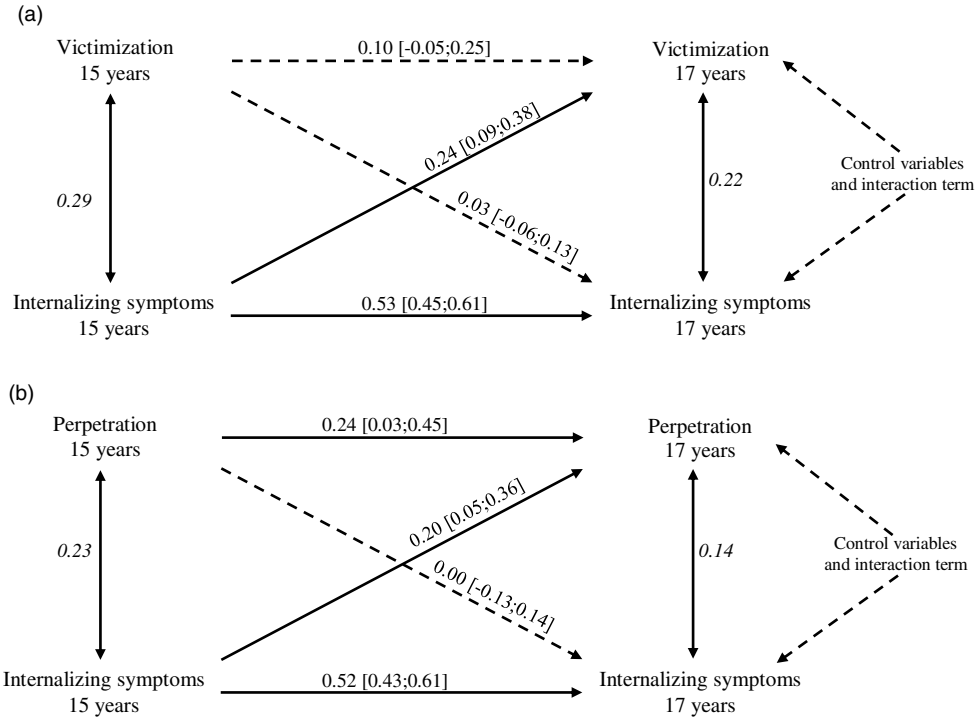

Figure 3. Cross-lagged associations between dating violence (victimization and perpetration) and internalizing symptoms adjusted for dating violence perpetration at 15 years (model A), dating violence victimization at 15 years (model B), the interaction between them (models A and B), and covariates listed in Table 1 (models A and B)[a]. Single-headed arrows represent associations (standardized coefficients, β [95% confidence intervals]) and double-headed arrows represent correlations (r). Solid lines represent significant associations ($p < .05$) and dashed lines represent non-significant associations ($p \geq .05$). [a]Data were compiled from the final master file of the Québec Longitudinal Study of Child Development (1998–2015), © Gouvernement du Québec, Institut de la Statistique du Québec.

17 years. However, neither victimization nor perpetration at 15 years was associated with internalizing symptoms 2 years later. Additionally, the interaction between victimization and perpetration at 15 years was not prospectively associated with any of the outcomes at 17 years. This pattern of results remained after adjusting for baseline characteristics, suggesting that the cross-lagged associations of internalizing symptoms with victimization were not explained by key demographic and mental health characteristics during childhood (Figure 3).

Sensitivity analyses

Residual depression and general anxiety symptoms at 15 years were not prospectively associated with victimization or perpetration at 17 years (Figures S3 and S4). With respect to subtypes of victimization, we found – as in the main analyses – that internalizing symptoms at 15 years were prospectively associated with physical, psychological, and sexual victimization at 17 years. In contrast, none of the subtypes at 15 years were prospectively associated with internalizing symptoms at 17 years (Figure S5). The same pattern was observed in the association between internalizing symptoms at age 15 and physical and psychological perpetration at age 17. There were no concurrent or prospective associations between sexual violence perpetration and internalizing symptoms (Figure S6).

Discussion

The aim of this longitudinal study was to examine if adolescents' internalizing symptoms predict subsequent victimization or perpetration, and similarly, if victimization or perpetration predict subsequent internalizing symptoms. The results showed that for both males and females, adolescents' internalizing symptoms at age 15 years predicted victimization and perpetration 2 years later. There were unique predictive effects of internalizing symptoms on later physical, psychological, and sexual victimization and physical and psychological perpetration. Contrary to expectations, our findings provided no support that victimization or perpetration predicted adolescents' internalizing symptoms over time. There were also no predictive effects of different types of victimization or perpetration on later internalizing symptoms. In other words, when considered simultaneously, internalizing symptoms increased the risk of dating violence, but victimization or perpetration did not increase the risk of internalizing symptoms. However, it is worth noting that the results provided support for concurrent associations between adolescents' internalizing symptoms and victimization and perpetration.

The concurrent associations could be explained by the fact that potential distress from violence (victimization or perpetration) in dating relationships may be rather immediate but relatively short-lived, resolving when the relationship is ended and new relationships are formed. Indeed, teen relationships tend to be fluid and fleeting, typically lasting less than 12 months, with 23% of adolescents having a breakup in the past 6 months (Connolly & McIsaac, 2009; Ha et al., 2010). Therefore, it is likely that in our study there were no longitudinal effects over a 2-year period as this might be a long time for an adolescent romantic relationship. The few existing longitudinal studies that have examined bidirectional associations in adolescents have also failed to provide support for bidirectional effects. In a longitudinal study, Smith et al. (2021) found consistent support for adolescents' internalizing symptoms predicting victimization over several time points, but inconsistent evidence was found for the reverse association. Yu et al. (2018) showed that adolescents' symptoms of depression and anxiety predicted dating violence perpetration 1 year later, but violence perpetration did not predict anxiety and depressive symptomatology. Furthermore, van Dulmen et al. (2012) found that adolescents' suicidality predicted dating violence victimization over time but dating violence victimization did not predict suicidality. Unlike previous studies which often examined either victimization or perpetration alone, the findings of our study add to the existing literature by showing that

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internalizing symptoms at age 15 years predicted both victimization and perpetration at age 17 years. Furthermore, the results add to the existing literature by showing that there were unique predictive effects of internalizing symptoms on later physical, psychological, and sexual victimization and physical and psychological perpetration. Importantly, these associations remained after accounting for the stability of the internalizing symptoms and dating violence, together with parent, child, peer, and family-level factors which could increase risk for both victimization or perpetration and internalizing symptoms. It appears that these findings are in line with the stress generation hypothesis of depression and also Coyne's interpersonal theory of depression, which argue that individuals with depression may experience stressful interpersonal events and exhibit behaviors that may increase the risk of interpersonal rejection (Coyne, 1976; Hames et al., 2013; Hammen, 1991, 2006).

An important step for future studies would be to understand the causal processes by which internalizing symptoms may lead to dating violence. As discussed earlier, depressed youth are more likely to behave and think in ways (e.g., rumination, criticism, passive behavioral responses) that may generate stress and interpersonal conflict, which may increase their risk of experiencing hostility and dating violence (Davila et al., 1995; Hammen, 1991, 2006; Smith et al., 2021). Another possibility is that depressed adolescents select partners who have mental health difficulties themselves (Merikangas, 1982). It is likely that in couples where both partners have internalizing symptoms and/or other mental health problems, the risk of negative dynamics and dating violence is significantly increased.

Of additional interest is the finding that the putative influence of internalizing symptoms was evident on both victimization and perpetration. These findings align with previous studies that have found increased internalizing symptoms among victims and perpetrators of dating violence (Choi et al., 2017; McCloskey & Lichter, 2003; Smith et al., 2021). Future research should identify the processes that contribute to victimization and perpetration. It is likely that perpetrators of dating violence "act out" their depression and frustrations and show reactive aggression (Yu et al., 2017). The concept of reactive aggression is based on the frustration-anger theory of aggression and "refers to angry, often emotionally dysregulated responses to perceived threats or frustrations" (Berkowitz, 1993; Card & Little, 2006, p. 467; Vitaro et al., 2006). Reactive aggression is relatively stable and has been found to be positively correlated with depression (Card & Little, 2006). In contrast, characteristics of depression including passivity, rumination, and fearfulness can potentially be the underlying causes of victimization. Of course, these speculations are tentative and future research is needed to test these hypotheses.

Another noteworthy finding was that girls self-reported higher levels of internalizing symptoms, sexual violence victimization, and physical violence perpetration than boys at 15 and 17 years. Compared to boys, girls were also more likely to be both perpetrators (at 17 years) and victims (at 15 and 17 years) of psychological violence. Taken together, it appears that girls are more likely to perpetrate both physical and psychological dating violence and that victimization and perpetration co-exist among girls. As previously discussed, studies have found that victims and/or perpetrators of more than one type of dating violence can experience greater mental health difficulties (Choi et al., 2017; Goncy et al., 2017; Haynie et al., 2013; Reyes et al., 2017). An important next step would be to identify the underlying processes that lead to the development and maintenance of the co-occurrence of victimization and perpetration.

Although it was not among the study's hypotheses, it is worth noting that *dating violence perpetration was stable over time*. This is consistent with previous studies showing that adolescent perpetrators of physical and sexual dating violence were more likely to perpetrate dating violence in the future (Cohen et al., 2018; O'Leary & Smith-Slep, 2003). Therefore, it appears that the experience of perpetration may predict subsequent perpetration. Future prospective studies should examine how perpetration may become stable over time. In contrast to prior work, there was no evidence supporting the stability of victimization over time (Fernández-González et al., 2020; Fritz & Slep, 2009). It is possible that victimization may be more of an interactive function of individual characteristics (such as depression) and the partner's characteristics, whereas perpetration may be mainly a characteristic of the individual.

Strengths, limitations, and conclusion

This study had many strengths. It used a large population-based birth cohort, had data on predictors and outcomes at two time points, and examined both victimization and perpetration and different types of dating violence. However, some limitations should be noted. While covariates were measured using multiple informants, internalizing symptoms and dating violence were measured with self-reports that could have been affected by adolescents' current mental health state and social desirability. Future studies should use cross-dyadic responses (O'Leary & Smith-Slep, 2003). This is important because individuals can be classified as perpetrators although their main motive is to defend themselves (Swan et al., 2008). Dating violence data were only collected from adolescents who reported being in at least one romantic relationship in the past 12 months. We therefore did not include adolescents who may have experienced dating violence in romantic interactions they did not classify as "relationships." Furthermore, we do not know whether participants were referring to dating violence in a single relationship or across multiple romantic relationships. Additionally, there were no available data on relationship processes and dyadic behaviors (e.g., mistrust, invalidation, infidelity, disagreements, breaking up, and reconciliation) and their impact on dating violence could therefore not be considered. Evidence shows that individuals who reported greater levels of conflict, jealousy, and cheating in their relationship were more likely to be perpetrators of dating violence (Giordano et al., 2010). Also, adolescent girls were at increased risk of perpetrating dating violence when they felt the relationship was serious (Cleveland et al., 2003; O'Keefe, 1997). Therefore, collecting information on relationship processes in future studies will be important, because interventions can pay more attention on the relationship or the individual (Johnson et al., 2015; O'Leary & Smith-Slep, 2003). Another limitation is that there were no available data on adolescents' participation in psychotherapy and/or whether they were on medication for internalizing problems and therefore, this factor was not considered in the analyses as a covariate.

Furthermore, as the study variables were only available at two time points, we were unable to disentangle within-person and between-person prospective associations in the cross-lagged model. Future studies with multiple waves of data (at least three) should consider comparing a random intercept cross-lagged model – which disentangles between-person variance from model parameters – with a standard model to overcome this limitation (Hamaker et al., 2015). The internal consistencies for victimization at 15 years and perpetration at 17 years were relatively low and therefore limit the reliability of our findings. Another limitation was that – given the low prevalence of ethnic and sexual minorities in our sample – we

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could not test moderation by these variables. However, researchers have stressed the importance of understanding how multiple social identities (e.g., sexual orientation, ethnicity, gender, low SES) may influence adolescent mental health and dating violence (Fix et al., 2021). Fix et al. (2021) found that, compared to heterosexual White boys, girls from sexual minorities with non-White ethnic backgrounds were more likely to be victims of physical and sexual dating violence. Minority youth are more likely to experience marginalization, discrimination, and oppression, and dating violence may therefore contribute to different experiences and mental health outcomes (e.g., Bowleg, 2012; Fix et al., 2021). Finally, the sample consisted mainly of White (French) Canadian adolescents and therefore the findings may not be generalizable to other populations.

Despite these limitations, the present findings have potential implications for prevention and intervention strategies. Thus, to prevent future dating violence, it is important to have universal preventive strategies and screening programs (e.g., in school settings) to identify adolescents at risk of victimization or perpetration (O'Leary & Smith Slep, 2003). Such programs should aim to identify and decrease risk factors (e.g., internalizing symptoms, anger, impulsivity) (O'Leary et al., 2006; Shorey et al., 2011). In this regard, interventions that aim to decrease adolescents' internalizing symptoms could potentially decrease the risk of dating violence assuming that the relation is causal. For example, cognitive-behavioral therapy and interpersonal psychotherapy have been used to successfully address depressive symptoms among adolescents (Weersing et al., 2017). Interventions should also target youth who have reported dating violence either as a victim (e.g., learn to behave assertively, use effective interpersonal problem solving) or a perpetrator (e.g., control anger effectively, learn to relax). This is important in light of evidence showing that among adolescents, only 40% of victims of dating violence and 21% of perpetrators ask for help (Ashley & Foshee, 2005). Finally, given the central importance of romantic relationships in adolescence, it is imperative to have universal programs that help adolescents form healthy romantic relationships (e.g., capacity for vulnerability and intimacy, emotional depth, balancing intimacy and independence) (Collins & Sroufe, 1999).

The findings of this study make a novel contribution to the literature by showing that adolescent boys and girls who experience internalizing symptoms are at risk of subsequent (2 years later) victimization and perpetration. Should these findings be replicated, future studies should identify the causal mechanisms through which these associations occur (e.g., emotion dysregulation, anger, decreased self-worth, shame and guilt) and the factors that play a buffering role (e.g., social support, academic competence, assertiveness).

Supplementary material. The supplementary material for this article can be found at https://doi.org/10.1017/S095457942200030X.

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Conflict of interest. None.

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