A Prospective Study of the Impact of Child Maltreatment and Friend Support on Psychological Distress Trajectory: From Adolescence to Emerging Adulthood

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Abstract

Background. Transition into adulthood is a critical developmental period that may be influenced by adverse life events as well as by protective factors. This study aimed at investigating the effect of different forms of child maltreatment experienced prior to age 14 (i.e., sexual abuse, physical abuse and exposure to intimate partner violence), and of friend support at age 14 on the psychological distress trajectory from age 14 to 24.

Methods. Participants were 605 adolescents from the general population involved in a 10-year longitudinal study. Psychological distress was evaluated at ages 14, 16, 18 and 24. Child maltreatment prior to 14 years was retrospectively assessed at 14 and 24 years while perception of support from friends was evaluated at age 14.

Results. Multilevel growth modeling indicated that psychological distress followed a significant decreasing curvilinear trajectory, with participants reporting fewer distressing psychological symptoms after 18 years. All three forms of child maltreatment, as well as their cumulative effect, predicted more psychological distress over 10 years above and beyond the protective effect of support from friends. Higher support from friends at age 14 was related to lower distress at baseline and over 10 years, beyond the effect of child maltreatment.

Limitations. Self-report nature of all measures, attrition, and measures of child maltreatment forms.

Conclusions. Psychological distress decreased during the transition from adolescence to emerging adulthood. Results also revealed the detrimental impact of child maltreatment and the promotive role of friend support, which underscore the importance of early intervention.

Keywords: sexual abuse; child maltreatment; poly-victimization; peer support; psychological distress; adolescence; emerging adulthood.

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Introduction

The transition from adolescence to adulthood is one of life's most critical transitions, involving many contextual and social role changes (Shulenberg et al., 2004). The journey into adulthood is not always smooth; stressful life events and psychosocial experiences can affect emerging adults' ability to adapt to this new phase in their lives (Burt and Paysnick, 2012; Werner and Smith, 1992). Among these adverse life events, child maltreatment has been identified as linked to negative consequences that can persist into adulthood (Gilbert et al., 2009; Herrenkohl et al., 2013; Norman et al., 2012). A growing body of literature also reveals that a minority of maltreated children will not present with mental health problems, and will therefore adapt positively to young adulthood (Daigneault et al., 2007; Hébert et al., 2014; McGloin and Widom, 2001). In parallel, research has underscored social support as one of the critical factors preventing the development of psychopathology (Chu et al., 2010; Cohen, 2004).

Despite extensive research in this area, there has been a paucity of studies on trajectories of change in a same cohort of emerging adults (Galambos et al., 2006). The majority of studies have thus relied on correlational designs to examine factors related to psychological distress. Moreover, studies have usually identified trajectories for symptoms of specific disorders (e.g., anxiety, depression) without considering their overlap or broader categorizations, such as internalizing symptoms (Weeks et al., 2014) or psychological distress (Jokela et al,. 2011). For example, results of the few studies using trajectory analyses seem to indicate altogether a normative curvilinear pattern for depressive symptoms, a similar construct to psychological distress, which increase through early and middle adolescence, peak during late adolescence (i.e.

at 17-19 years), and decline through adulthood (Elovainio et al., 2012; Galambos et al., 2006; Galambos and Krahn, 2008; Ge et al., 2006). A cubic trajectory was also found for depressive symptoms: a slight decrease from 12 to 14, an increase at age 14 to 17, and a downward trajectory through 21 years (Rawana and Morgan, 2014). Results also indicate that psychological distress is more common among girls in adolescence (Nilsen et al., 2013), and remains so in adulthood (Elovainio et al., 2012; Galambos and Krahn, 2008; Rawana and Morgan, 2014). These results are interesting, but it would be important to also assess changes, if any, in psychological distress across the transition from adolescence to emerging adulthood. Considering the economic and social burden of psychological distress to society (Kessler and Greenberg, 2002; Gibb et al., 2011), it is important to examine factors that may influence its trajectory at a time where adolescents and young adults may be more vulnerable. The current study extends previous work by assessing the impact of child maltreatment and social support on the trajectory of psychological distress over a period of 10 years.

Child maltreatment

According to the World Health Organization (WHO), child maltreatment refers to "all forms of physical and/or emotional ill-treatment, sexual abuse, neglect or negligent treatment or commercial or other exploitation, resulting in actual or potential harm to the child's health, survival, development or dignity in the context of a relationship of responsibility, trust or power" (WHO, 1999, p.15). Results from a recent population survey conducted in Canada with 23,000 adults show that 32% had experienced physical abuse, sexual abuse and/or exposure to intimate partner violence in childhood (Afifi et al., 2014). Child maltreatment is considered a nonspecific risk factor for short- and long-term psychological maladjustment (Gilbert et al., 2009; Maniglio, 2009). It is difficult to disentangle the effects of different forms of maltreatment as each can

predict different and/or the same outcomes, some of which can have a stronger impact when studied together with others (Edwards et al., 2003; Fergusson et al., 2008; Richmond et al., 2009). For example, Fergusson et al. (2008) found that child sexual abuse was more consistently associated with increases in risks of later mental health problems than child physical abuse.

Although several studies have documented the heterogeneity in the consequences of child maltreatment, there are clearly gaps in our understanding of its overall impact on the psychological distress trajectory during the transition from adolescence to adulthood. To date, links between child maltreatment and negative outcomes have been studied at one time point, even in longitudinal studies (Fergusson et al., 1996; 2008; Lynskey and Fergusson, 1997). To our knowledge, no study has investigated child maltreatment using growth modeling over long time spans to document changes in youth's developmental trajectories. As Trickett et al. (2011a) suggested: "We know that for many victims, maybe most, child maltreatment is associated with maladaptive development in adolescence, but we still know little about how different forms of maltreatment, in different combinations, at different developmental stages, put in motion these developmental problems" (p. 14). Moreover, less is known about the unique contribution of different forms of child maltreatment on youth mental health above and beyond salient protective factors in adolescence, such as friend support (Colarossi and Eccles, 2003).

Friend support

Extensive research has found social support to be a protective factor for psychological distress in youth and adults (e.g., Chu et al., 2010; Cohen, 2004; Collishaw et al., 2007; Nilsen et al., 2013). Results of Chu et al. (2010) meta-analysis indicate that social support (from family, friends, teacher or others) is negatively associated with psychological distress among youth. Results of recent longitudinal studies also confirmed this effect by showing that social support

predicts decreases in psychological distress in adolescence (over 1 year; Colarossi and Eccles, 2003), from adolescence to adulthood (over 4–8 years; Feldman et al., 2004), and in adulthood (over 3–7 years; Galambos et al., 2006; Sperry and Widom, 2013).

Different sources of support may also have different effects on psychological distress (Colarossi and Eccles, 2003; Collishaw et al, 2007; Feldman et al., 2004; Boudreault-Bouchard et al., 2013). In adolescence, studies have highlighted the growing importance of friends (e.g., De Goede et al., 2009), which may be related to the fact that adolescents become increasingly autonomous and individuated from their parents. For example, results of a recent study indicate that low friend support at age 14.5, but not parent or teacher support, predicts increases in depressive symptoms for girls, but not for boys, from early to later adolescence (Nilsen et al., 2013). Adolescents may feel more at ease to confide in their friends than to their parents, as they begin to have romantic and sexual experiences (Arnett, 2014). Moreover, friends may be the only source of support for adolescents who are maltreated by their parents. Indeed, studies with sexually abused youth reveal that adolescents more often rely on friends than parents for support and perceive friend support as positive, yet greater sense of support from friends is not always associated with less distress in this population (Feiring et al., 1998; Regnault et al., 2015).

Although many studies have examined the effect of friends as a source of support, insufficient attention has been given to its long-term effect from adolescence to adulthood. Two longitudinal studies suggest that more friend support at 15–18 years is associated with decreases in depression one year later among adolescents from the general population (Colarossi and Eccles, 2003) and that the adequacy of maltreated adolescents' friendships predicts their psychological well-being in adulthood (Collishaw et al., 2007). Overall, a growing body of research indicates that friend support is positively related to youth and adult well-being, but

questions still remain as to how it relates to psychological distress trajectories over time in a context of child maltreatment.

Study objectives and hypotheses

Now that past longitudinal studies have demonstrated beyond a doubt that child maltreatment and friend support are important risk and protective factors to consider when studying psychological distress, researchers need a better understanding of the timing at which those factors have an impact and their independent effect above and beyond their respective effect. This four wave longitudinal study will thus provide a unique contribution to the literature by examining the impact of three forms of child maltreatment, their cumulative effect, and the effect of friend support on the psychological distress trajectory from 14 to 24 years.

This study aimed to determine 1) the psychological distress trajectory over a 10-year period, from adolescence to emerging adulthood; 2) the effect of gender; 3) the unique contribution of three different forms of child maltreatment experienced in childhood (prior to age 14) namely sexual, physical and exposure to partner violence), 4) their cumulative effect, and 5) friend support at age 14 on this trajectory. Based on previous studies, the current study's hypotheses are fourfold: 1) psychological distress will show, on average, a decreasing curvilinear trajectory over time, 2) girls will present more psychological distress than boys, 3) the presence of each form of child maltreatment and their accumulation will be associated with higher levels of psychological distress at baseline and throughout the study compared to no or fewer maltreatment experiences in childhood, and 4) more friend support at age 14 will be associated with less psychological distress throughout the study than less friend support. We will also evaluate if the distress trajectory is different for maltreated vs. non-maltreated youth and for participants with above average vs. below average friend support.

Methods

Participants

In 2002, a sample of 1400 students aged 14 years was randomly selected from the 3546 students attending public and private high schools in Saguenay–Lac-St-Jean, a geographically isolated and homogeneous Canadian population (98.5% are Francophone). Among those randomly selected, a representative sample of 1176 students completed a questionnaire (non-participation was mainly related to school absences). From that sample, 605 participants were authorized by their parents to participate in the longitudinal study. Statistical analyses were performed to compare the 605 participants in the longitudinal study with the 571 who dropped-out after the baseline assessment. The results indicate that participants were more likely than dropouts to be female (55.6% vs. 45.3%) and to have parents with a postsecondary degree (67.5% vs. 53.0%). No difference was found between participants and dropouts in terms of perceived economic conditions and psychological distress.

The data used in this study were collected during the first four waves (2002, 2004, 2006 and 2012) of this ongoing longitudinal study. Of the 605 participants, 408 (67.4%) completed the questionnaires at age 16, 413 (68.3%) at age 18, and 370 (61.2%) at age 24. For the analyses, all cases for which data were available at one wave or more ($N = 605$) were used. At age 14, all participants lived in the Saguenay–Lac-St-Jean. At 24 years old, the majority of the participants (63.8%) still resided in their region of origin. Among the participants, 10.5%, 9.5%, 13.9% and 17.4% aged 14, 16, 18 and 24 years, respectively, reported experiencing food insecurity (e.g., couldn't afford to eat balanced meals), an indicator of low socioeconomic status (Anderson, 1990; Nord and Prell, 2007). Attrition analyses indicate that only gender (being male) was associated with dropout at T4. No significant differences were found for psychological distress,

friend support, child maltreatment, having a parent with a postsecondary degree, and food insecurity.

Procedures

Participants completed a self-administered questionnaire at school in 2002. In 2004, they had the choice of an online or paper version of the questionnaire. In 2006, they either attended a group session at school or completed the questionnaire at home. In 2012, the majority of the participants completed the questionnaire online. This study was approved by the institutional review board (IRB) of the ministère de la Santé et des Services sociaux of Québec (first three waves) and by IRB of the first author's affiliated university (fourth wave). Informed consent was obtained from all participants at each wave, and from parents in the first wave.

Measures

Psychological distress. The validated 14-item version of the Psychological Distress Index (Deschesnes, 1998; Préville et al., 1992) was used to assess the frequency of psychological distress (symptoms of anxiety, depression, aggressiveness, and cognitive problems) on a four-point Likert scale, at each wave (14, 16, 18 and 24 years). Following a linear transformation, total scores range from 0 to 100, with a higher score indicating a higher level of psychological distress. Cronbach's alphas ranged from .88 to .91 for the four data collections.

Friend support. At 14 years, perception of friend support was measured using four items developed by Bellerose et al. (2002) on a four-point Likert scale ranging from strongly disagree (1) to strongly agree (4). Examples of the items are: "I feel close to my friends," "My friends are available when I need them". Cronbach's alpha in our sample was 0.62.

Child maltreatment. Three child maltreatment measures inquire about experiences that occurred before age 14. An affirmative answer to at least one of the two following items at wave

1 was scored as having experienced physical abuse: being pushed, slapped or hustled; or being hit violently in the past twelve months (Deschesnes et al., 1997) (8.2% of the sample). An affirmative answer to the following item at wave 1 was scored as having been exposed to intimate partner violence: your parents yell or insult each other "often" or "very often" (Deschesnes et al., 1997) (8.1% of the sample). An affirmative answer to at least one of the following two items at wave 4 was scored as having experienced sexual abuse: unwanted sexual touching by an adult or a child 3 years older than you and unwanted sexual intercourse (Tourigny et al., 2008). Another question asked if these events happened before 14 years of age. An affirmative answer to this last item was scored as having been sexually abused before 14 (7.5% of the sample). A cumulative index was then calculated by summing the presence of those three forms of maltreatment prior to 14 years, which yielded a cumulative score of 0 (no maltreatment = 81.1%), 1 (one of the three forms = 15.9%), 2 (two forms of maltreatment = 3.0%) or 3 (three forms of maltreatment = 0%).

Data analysis

Multilevel growth models were computed using *MPlus* (version 6). In this type of analysis, repeated observations are treated as nested within individuals and change over time is modeled in two levels: a Level 1 component representing individual (within-person) change over time and a Level 2 component representing the extent that changes differ across individuals (between-person). Missing data were handled using Full Information Maximum Likelihood (FIML), which produces less biased estimates of the parameters of interest compared to listwise deletion, pairwise deletion, or mean substitution. FIML is comparable to multiple imputation (Johnson and Young, 2011), but instead of replacing missing data points, it uses partially available information from one case to adjust parameter estimates with missing data and gives

larger weights to individuals with more repeated assessments (Burchinal et al., 2006). This produces stable, more efficient parameters (Graham et al., 2009; Johnson and Young, 2011). Singer and Willett's (2003) multiple steps procedure, described below, was used to test hypotheses.

Modeling change in psychological distress over time. To evaluate the overall shape of the psychological distress growth trajectory, two unconditional models were computed: a) the unconditional mean model, which assumed no change in scores over time, and b) the unconditional growth model, which included time as a predictor (coded such that the intercept signifies psychological distress at 14 years old and the rate of change in psychological distress represents its yearly decrease or increase). Finally, we explored nonlinear trajectories of change, c) a third unconditional growth model testing whether there was a significant decrease or increase in the rate of change over time, with the addition of a quadratic term.

Predicting change in psychological distress over time. Once the trajectory of distress over time was established (shape of the curve), we fitted a series of nested multilevel models in which we tested the effect of each predictor, added sequentially, on the intercept and the rate of change. The coefficient of each predictor represents its effect on the initial status (baseline), so that each statistically significant predictor has a unique contribution above and beyond the other predictors. These effects of the independent variables on baseline levels of distress will stay the same at all-time points unless they significantly interact with time.

The independent variables were entered in the model in the following order: 1) gender, 2) sexual abuse, physical abuse and exposure to intimate partner violence (all the maltreatment items were dichotomous variables such as the intercepts represent the average distress score of people that were not maltreated), and 3) friend support (grand mean-centered). This analysis was

run again using the cumulative child maltreatment index in place of the three unique child

maltreatment forms in the following order: 1) gender and cumulative maltreatment index and 2)

friend support (grand mean-centered)**.**

When zero is not a valid value for a predictor, which was the case for friend support in

this study, interpreting its fitted intercept can be difficult. It is thus suggested to re-center the

predictor in question before conducting the analysis (Singer and Willet, 2003). This means that

the intercept of the friend support (centered) measure represents the average fitted value of the

initial status, i.e., distress of people who receive average support. The coefficient of friend

support thus represents the predicted increase in distress that results from an increase in friend

support by one standard deviation from the mean. Finally, model fit were evaluated by

comparing the Akaike information criterion (AIC), the Bayesian information criterion (BIC), and

the log-likelihood (deviance) statistics, with lower values signifying a better representation of the

data by the model (Singer and Willet, 2003).

Results

Psychological distress trajectory

The quadratic model yielded a much better fit than the linear model, with lower values for

the AIC, BIC and the log-likelihood, indicating that the quadratic model was preferable. The

results showed that the initial level of psychological distress ($\gamma = 26.99$, SD = .63, $p < 0.000$) and

the quadratic rate of change ($\gamma = -0.14$, SD = 0.03, $p < 0.000$) were statistically significant. The

linear rate of change was non-significant ($\gamma = 0.24$, SD = 0.23, $p > .05$). The psychological

distress intercept ($\sigma_0^2 = 150.24$, SD = 16.59, $p < .000$), linear ($\sigma_1^2 = 8.43$, SD = 2.34, $p < .000$) and

quadratic factor variances ($\sigma_2^2 = 0.18$, SE = .05, $p < .000$) were significant. Psychological distress

followed a significant decreasing curvilinear trajectory, with participants reporting, on average,

fewer distressing psychological symptoms over time. The quadratic trajectory indicates a lower level of psychological distress at 14 years that slightly increased and peaked at 18 years, followed by a decrease into emerging adulthood. These results also suggest that there were significant individual differences in the growth trajectory across participants, which may be explained by child maltreatment, friend support or other factors.

Predicting psychological distress trajectory

The parameter estimates for each of the predictors in the final model are listed in Table 1. In the final model, each independent variable had a unique and statistically significant effect on the initial status of psychological distress indicating that psychological distress was significantly higher among girls and victims of the three forms of child maltreatment. For example, being sexually abused increased the psychological distress score by 9.55. As the predictors did not interact with time (no effect on the rate of change), their effects remained the same over time. Moreover, the results indicate that being exposed to intimate partner violence had the strongest impact on psychological distress, followed by being sexually abused and then physically abused.

The results also indicated a significant effect of friend support at 14 years on the initial status, which means that increased friend support at age 14 predicted lower levels of psychological distress. Furthermore, the results revealed interactions with time (a positive linear rate of change and a negative curvilinear rate of change). Therefore, those with higher friends support started out lower on psychological distress, rose faster to their zenith in emerging adulthood, but then decreased at a faster rate after peaking. Moreover, the level of psychological distress remained lower among participants with higher friend support compared with those with lower friend support throughout the study.

Table 1

Effect of child maltreatment types and friend support on the psychological distress trajectory

Psychological Distress = .36	Final Model	
Variables	Coefficient	*SD*
Initial Status		
Intercept	21.57***	1.16
Sex (female)	6.77***	1.53
Sexual abuse	9.55*	4.33
Physical abuse	6.20*	3.24
Exposure to domestic violence	11.87*	4.93
Friend support	-6.27***	1.48
Linear rate of change		
Intercept	0.23	0.47
Sex (female)	-0.14	0.69
Sexual abuse	0.91	0.65
Physical abuse	-2.40	1.34
Exposure to domestic violence	0.44	2.48
Friend support	1.62***	0.47
Quadratic rate of change		
Intercept	-0.08	0.07
Sex (female)	-0.06	0.09
Sexual abuse	-0.31	0.27
Physical abuse	0.35	0.20
Exposure to domestic violence	-0.15	0.36
Friends support	-0.19**	0.07
Goodness-of-fit		
Loglikelihood	-5360.95	
AIC	10771.90	
BIC	10901.08	

$* p < .05.$ $** p < .01.$ $*** p < .001.$

Similar results were obtained when running analyses using the cumulative index of child maltreatment (see Table 2). The results showed that psychological distress was significantly higher among girls and that it increased with the number of forms of child maltreatment experienced. Moreover, psychological distress remained higher from 14 to 24 years among

victims of child maltreatment and females (no interaction with time). While the cumulative index

of child maltreatment had no impact on the rate at which psychological distress decreased over

time, friend support accounted for significant variance in the intercept and the linear and

quadratic slopes of psychological distress. As for the model presented in Table 1, participants

with greater friend support had lower rates of psychological distress at 14 years, and significant

linear and curvilinear rates of change.

Table 2
Effect of multiple-type maltreatment and friend support on the psychological distress trajectory

Psychological distress = .36	Final Model	
Variables	Coefficient	*SD*
Initial status		
Intercept	26.03***	1.16
Sex (being a girl)	7.17***	1.51
CCM	9.52***	2.20
Friend support	-7.60***	1.65
Linear rate of change		
Intercept	0.07	0.46
Sex	0.08	0.58
CCM	-0.66	0.76
Friend support	1.48***	0.51
Quadratic rate of change		
Intercept	-0.05	0.07
Sex	-0.10	0.09
CCM	0.01	0.11
Friend support	-0.15**	0.07
Goodness-of-fit		
Loglikelihood	-5363.08	
AIC	10770.15	
BIC	10883.83	

Note. CCM = Cumulative index of child maltreatment.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Discussion

This large-scale longitudinal study aimed at investigating how friend support at age 14 and different forms of child maltreatment, i.e., sexual, physical, and exposure to partner violence, may impact the psychological distress trajectory from age 14 to 24.

Distress trajectory

The first goal of our study was to describe the psychological distress trajectory. As hypothesized, the average psychological distress trajectory was shown to increase in adolescence and to decrease following transition into adulthood. This curvilinear trajectory indicates that the decline in psychological distress was greater from the end of adolescence, through the transition to adulthood (18–24 years), which concurs with previous longitudinal studies among adolescents and emerging adults on similar constructs to psychological distress (Elovainio et al., 2012; Galambos et al., 2006; Galambos and Krahn, 2008; Ge et al., 2006; Landstedt et al., 2015; Rawana and Morgan, 2014). This result may indicate a general improvement in psychological well-being during the transition from adolescence to emerging adulthood, following the tumult encountered in adolescence. The several changes occurring simultaneously during the transition to emerging adulthood, such as social role changes (e.g., marriage, employment) and normal neurobiological changes (Shanahan, 2000; Shulenberg et al., 2004), may provide some youth with an opportunity to develop new relationships and to achieve greater autonomy (Arnett, 2014), which may lower psychological distress (Yaroslavski et al., 2013). It should be noted that results of this current study revealed a general pattern for the psychological distress trajectory. Therefore, individual patterns may also be found for different groups, which are shown when using latent class growth modeling analyses (see for e.g., Elovainio et al., 2012; Weeks et al., 2014; Yaroslavski et al., 2013). For example, the shift to emerging adulthood could promote

distress among a specific group of youth who present with existing maladaptive coping repertoires (Schulenberg and Zarrett, 2006). Results also revealed that the average psychological distress trajectory remained significantly higher among females compared to males, which is consistent with most previous studies (Edwards et al., 2003; Galambos et al., 2006).

Effect of child maltreatment on distress

Also as hypothesized, the baseline level of psychological distress was predicted by child maltreatment indicating that maltreated participants' distress was higher at baseline, and remained higher over ten years, than that of non-maltreated youth. This remained true whether maltreatment forms were assessed separately or using a cumulative index of maltreatment. This suggests that child maltreatment, including physical and sexual abuse and witnessing partner violence, is a serious risk factor that has a detrimental long-term impact on psychological well-being. These results confirm those of previous studies that have found adults maltreated in childhood present higher levels of psychological symptoms or difficulties compared with non-maltreated adults (e.g., Fergusson et al., 2008; McGloin and Widom, 2001; Trickett et al., 2011b). Results also indicate that exposure to intimate partner violence might have a stronger impact than sexual and physical abuse. Moreover, child sexual abuse had a more long-term negative effect than physical abuse, which concurs with previous studies (e.g., Fergusson et al., 2008; McGloin & Widom, 2001).

The cumulative effect of child maltreatment observed in the current study corroborates results from previous studies (Bouchard et al., 2008; Clemmons et al., 2007; Edwards et al., 2003; Richmond et al., 2009). Indeed, a higher number of child maltreatment forms was related to more psychological distress at baseline, distress which remained higher throughout the 10-year period. The cumulative index of child maltreatment had no impact on the rate at which

psychological distress decreased over time. This means that maltreated participants exhibited a similar rate of recovery from psychological distress over ten years compared with non-maltreated participants. However, because participants maltreated in childhood had greater levels of distress at 14, they also enter adulthood with greater levels of distress than their non-maltreated counterparts. In other words, having experienced one or more forms of maltreatment increased only their overall level of distress, but did not impact the rate at which their distress diminished over time. Further studies should consider additional forms of child maltreatment. As we did not capture all forms of child maltreatment, and only evaluated victimization prior to 14 years, we obtained a relatively low prevalence rate compare to a recent Canadian epidemiological study (Afifi et al., 2014). The lack of association between maltreatment and the rate of change in psychological distress over 10 years may be due to lower variations in this sample compared to other samples (e.g., in clinical or child-welfare samples); the impact of abuse being harder to detect with this lower statistical power.

As this is the first study using multilevel growth modeling, further studies are clearly needed to better understand the psychological distress trajectory over time in general and for victims of child maltreatment in particular. It should be noted that the presence of significant stressors in adolescence or adulthood may influence some of the effects of adversity experienced in childhood. For example, exposure to one form of childhood abuse or other adverse childhood experiences is associated to an increased risk of having another one (Dong et al., 2004), which could also have an impact on victims' psychological distress trajectory. Moreover, exposure to childhood adversity increases vulnerability to the deleterious mental health effects of later stressors (e.g., McLaughlin et al., 2010). Alterations in stress-sensitive neurobiological systems are thought to underlie this increased risk of reactivity to stress and psychopathology (Heim and

Nemeroff, 2001). Child maltreatment may thus affect psychological adjustment during the transition to adulthood by increasing inherent vulnerabilities. This possibility and other abuse experienced throughout this study were not examined, but should be explored further.

Effect of friend support on distress

As for our fifth goal and related hypothesis, our results indicate that friend support had an impact on psychological distress: greater friend support at age 14 was associated with less distress at 14 and throughout the 10-year span of the study. This had also been found in prior studies among adolescents (Colarossi and Eccles, 2003) and adults (Collishaw et al., 2007; Feldman et al., 2004). Another finding unique to this study was that friend support received at 14 years was related not only to youth's initial levels of psychological distress, but also to changes in participants' psychological distress over time. Indeed, although those with more friend support at 14 continued to show lower levels of distress throughout the study compared with those with less friend support, our results suggest that the impact of friend support received at 14 years on psychological distress followed a curvilinear decrease over time. It may be related to changes associated with the transition to adulthood. Because friendships are dynamic systems in constant evolution during adolescence (Poulin and Chan, 2010), friend support received during emerging adulthood may differ from that received at age 14 and may not come from the same friends. Although romantic partner support was not considered in the present study, it may become more important in adulthood, as the effect of friend support during adolescence decreases over time. Research examining the effects on psychological distress of friend support received before and after 14 years is likely to be fruitful. The mechanisms through which increased friend support at 14 years can have such a lasting, constant effect on psychological distress over ten years, regardless of previous childhood maltreatment, should be studied in greater detail.

Friend support also remains an important factor to consider in maltreated youth since they may receive less of it than their non-maltreated counterparts (Sperry and Widom, 2013). For these youth, it may be important to assess not only general support from friends, but also support specific to the child maltreatment situation. For example, it has been shown, in a sample of college women, that social reactions, such as emotional support following disclosure of sexual victimization, were associated with increased coping (Orchoswki et al., 2013). Increased support for maltreated youth may help them recover faster and reach a level of psychological adaptation similar to that of their non-maltreated peers. Studies are needed to identify mechanisms that enable such a "return to normal functioning" among maltreated youth. A better understanding of the timing and mechanisms of these relationships is needed to help develop more effective preventive interventions and treatments (Sperry and Widom, 2013). While friend support intervention may help increase well-being (see for e.g., Pfeiffer et al., 2011 for a meta-analysis), it should be considered by clinicians when implementing interventions. Further studies are also needed to investigate other predictors of psychological adaptation trajectories, such as school engagement and academic success, which are central issues during the transition from adolescence to adulthood.

Limitations and strengths of the study

The results of this study need to be interpreted in light of its limitations. Measures of child maltreatment experiences were self-reported and retrospectively assessed, at age 14 (physical abuse and exposure to intimate partner violence) and 24 years (sexual abuse), which can lead to recall biases (Gilbert et al., 2009; Hardt and Rutter, 2004).

The low internal reliability of the friend support scale, while maybe due to the restricted number of items (4), may have underestimated its effect on psychological distress. In this study,

friend support was evaluated according to the individual's perception of emotional support received and its availability. While perceived social support usually acts as a stronger predictor of psychological adjustment in the general population (Norris and Kaniasty, 1996) and for child maltreatment victims (Pepin and Banyard, 2006), further studies should also consider other aspects of social support, such as informational and instrumental support (Cohen, 2004).

Although the level of psychological distress was similar among participants and dropouts, participants were more likely than dropouts at baseline to be female and to have parents with a postsecondary degree. Moreover, we had high attrition rates between baseline and T4, which is also a problem shared by several longitudinal studies. Attrition analyses indicated that gender was the only variable predicting dropout at T4. However, because the analyses used FIML to handle missing data, which can accurately estimate coefficients of participants with missing data points (Johnson and Young, 2011), the risk of bias is greatly diminished. Caution should nonetheless be used when generalizing the results to the adolescent and emerging adult populations.

Another limitation of the study was our reliance on a psychological distress measure assessing mostly internalized symptoms of distress. Because boys may show more externalized manifestations of distress than girls (Leadbeater et al., 1999; Marcotte et al., 2001), our results may underestimate males' level of distress. Men may also be more reticent than women to report psychological distress under certain conditions (see e.g., Berger et al., 2012). Altogether, it may partly explain girls' elevated rates of psychological distress in ours and other studies and indicates that future studies of the longitudinal course of psychological distress in maltreated youth should strive to assess manifestations of psychological distress that are relevant to females and males.

Beyond these measurement issues and sample biases, an important strength of this research is the longitudinal scheme used, combined with a robust and appropriate statistical technique, multilevel growth modeling, which overcome the limitations of other statistical methods (Burchinal et al., 2006; Dupéré et al., 2007; Hedeker, 2004). To the best of our knowledge, this is the first study to examine the impact of both child maltreatment and friend support on a 10-year trajectory of psychological distress. Other strengths of this current study include the fact that we studied the psychological distress trajectory from adolescence to adulthood rather than concentrating on one developmental period. We also used a large-scale community sample instead of clinical or specialized samples. In addition, we evaluated the long-term effect of perceived friend support during adolescence, which has been less studied to date.

Conclusion

Overall, results of this 10-year longitudinal study increased our understandings of the psychological distress trajectory as well as risk and protective factors during transition to emerging adulthood. Results indicate that psychological distress decreases during this transition. They also reveal the important and promotive role of social support provided during adolescence for the recovery from short- and long-term psychological distress, above and beyond the negative effects of child maltreatment. Considering the negative impact of child maltreatment, investment in policies and preventive programs are crucial for minimizing children's exposure to maltreatment (Fergusson et al., 2013). Clinicians should also thoroughly assess all forms of maltreatment experienced by their patients and implement interventions accordingly. Since the effect of child maltreatment continues into emerging adulthood, long-term interventions should also be considered to help increase youth and adults' resilience.

Acknowledgments

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