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### Permalink

<https://escholarship.org/uc/item/2kd2r9j5>

### Journal

Journal of Clinical Child & Adolescent Psychology, 44(5)

### ISSN

1537-4416

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### Publication Date

2015-09-03

### DOI

10.1080/15374416.2014.910788

Peer reviewed



Published in final edited form as:

*J Clin Child Adolesc Psychol.* 2015 ; 44(5): 742–750. doi:10.1080/15374416.2014.910788.

## Close Friends' Psychopathology as a Pathway from Early Adversity to Young Adulthood Depressive Symptoms

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### Abstract

**Objective**—Past research has highlighted the negative impact of early adverse experiences on childhood social functioning, including friendship selection, and later mental health. The current study explored the long-term effects of early adversity on young adults' close friends' psychological symptoms, and the impact of these close friendships on later depressive symptoms.

**Method**—A prospective longitudinal design was used to examine 816 youth from a large community-based sample, who were followed from birth through age 25. Participants' mothers provided contemporaneous information about adversity exposure prior to age 5, and participants completed questionnaires about their own depressive symptoms at age 20 and in their early 20's. Youth also nominated a best friend to complete questionnaires about their own psychopathology at age 20.

**Results**—Individuals who experienced more early adversity by age 5 had best friends with higher rates of psychopathology at age 20. Moreover, best friends' psychopathology predicted target youth depressive symptoms two to five years later.

**Conclusions**—Results indicate that early adversity continues to affect social functioning throughout young adulthood, and that best friendships marked by elevated psychopathology in turn negatively affect mental health. Findings have implications for clinical interventions designed to prevent the development of depressive symptoms in youth who have been exposed to early adversity.

### Keywords

Early adversity; peer relationships; depression; longitudinal

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Exposure to stressful early life experiences, such as poverty or maltreatment, confers risk for a wide array of mental health difficulties, including anxiety, mood disorders, and substance use disorders (Green et al., 2010; Schilling, Aseltine, & Gore, 2007). Early adverse experiences likely contribute to poor mental health through a number of different mechanisms, including neuroendocrine, genetic, and relational and environmental processes.

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In the current study, a particular pathway from early life stress to depression outcomes was examined: negative characteristics of best friendships in young adulthood. The current analyses focus on youth depression outcomes, given that both early life stress (Kessler & Magee, 1994; Liu et al., 2009; Nanni et al., 2012) and later stress in interpersonal relationships (Hammen, 2005; Rudolph et al., 2000) serve as potent predictors of the onset and course of depression. Moreover, depression shows a sharp increase in prevalence during adolescence and young adulthood (Hankin et al., 1998), a time when relationships with friendships become increasingly important for individuals' emotional well-being (Parker, Rubin, Erath, Wojslawowicz, & Buskirk, 2006; van Lieshout, Cillessen, & Haselager, 1999). Thus, selection into problematic interpersonal relationships might be an especially important pathway from early stressful experiences to depressive symptoms to explore during this developmental period.

There are several reasons to focus on friendships in mapping the association between exposure to early adverse conditions and later depression. One is that there is a large body of evidence indicating that children who have experienced emotionally and behaviorally disruptive early stress exhibit significant difficulties in interpersonal relationships. These children have been shown to engage in increased rates of problematic social behaviors, such as aggression and withdrawal (Bolger & Patterson, 2001; Kim & Cicchetti, 2010; Teisl & Cicchetti, 2007), and these social skills deficits in turn have been shown to lead to higher rates of peer rejection (Bolger & Patterson, 2001; Fantuzzo et al., 1998). These social deficits may increase the likelihood that individuals who have experienced adversity will develop potentially problematic friendships with peers who exhibit similar social deficits, including various internalizing and externalizing symptoms. Little research has examined such friend selection processes for individuals who have experienced early adversity. Children who have experienced early adversity report that they perceive the friendships they do have to be marked by more negative qualities, such as conflict, betrayal, and criticism, and fewer positive qualities, such as supportiveness (Howe & Parke, 2001; Kerns et al., 1996; McCloskey & Stuewig, 2001). However, more research is needed to determine the characteristics of friends selected by individuals who have experienced early adversity.

Second, little research has examined social difficulties beyond childhood into adolescence and young adulthood. There have been a few studies of adult romantic relationships among those abused as children. In these studies, individuals who were maltreated in childhood describe their romantic partners as more violent and aggressive (Ornduff et al., 2001), as well as more uncaring and over-intrusive (Mullen et al., 1996). However, further research is needed to determine whether early adversity has a long-term impact on selection into other close relationships beyond childhood. Moreover, current research has largely focused on maltreatment (e.g., physical abuse, sexual abuse) in examining the effects of early adversity on later social functioning. Few studies have examined the long-term effects of a wider range of adversities on characteristics of interpersonal relationships. This is an important area for future research, given that previous research has shown that specific adversities, such as maltreatment and parental mental illness, tend to occur in clusters, and cumulative risk might be an important predictor of mental and physical health (Dong et al., 2004; Finkelhor, Ormrod, & Turner, 2007; Green et al., 2010).

Finally, dysfunctional friendships have important implications for depression later in life. Stressful interpersonal relationships in general have been identified as a potent risk factor for later depression (Hammen, 2005; Rudolph et al., 2000). Hammen's (1991) model of stress generation suggests that individuals vulnerable to depression tend to contribute to the occurrence of stressors, such that stressful interpersonal contexts and depressive symptoms might have a bi-directional relationship over time. Consistent with models of stress generation, youth at-risk for depression have been found not only contribute to stressful life events, but also to create environments that are dysfunctional and persistently stressful, thus provoking continuing risk for depressive experiences (Hammen, Brennan, & Le Brocque, 2011; Katz, Hammen, & Brennan, 2013; Keenan-Miller, Hammen, & Brennan, 2007). Thus, individuals who have experienced early life stress might be more likely to select close friends who are themselves less capable of providing support and engaging in adequate conflict resolution, thereby contributing to increased risk for depression for the target individual. This may be particularly true of close friendships during adolescence and young adulthood, when friends become a primary source of advice and support (van Lieshout et al., 1999).

Friends who exhibit problem behaviors, such as externalizing or externalizing symptoms, might also influence youth depressive symptoms through a sort of "contagion effect." In past research, adolescent friends have been shown to influence each others' levels of internalizing and externalizing symptoms, both in best friend dyads and larger peer groups (Howes, Hokanson, & Loewenstein, 1985; Prinstein, Meade, & Cohen, 2003; Rosenquist, Fowler, & Christakis, 2010; Stevens & Prinstein, 2005; Van Zalk et al., 2010). Thus, forming problematic friendships with peers who show elevated rates of psychopathology could in turn lead to increased distress for the target individual as a result of the transmission of maladaptive thoughts or behaviors.

The current study therefore sought to examine whether early adversity contributes to increased rates of psychopathology in close friends in young adulthood, and whether these problematic friendships in turn create risk for depression. In addition, analyses tested the indirect effects of early adversity on later depressive symptoms, via best friend psychopathology, to determine whether selection into problematic best friendships might serve as a mediator of this relationship, consistent with theories of stress generation. Pathways were examined using a prospective, longitudinal dataset and a large community sample uniquely suited to addressing questions about social functioning and depressive symptoms across development. Youth experiences with stress and depressive symptomatology were measured from mothers' pregnancy into their early 20's, and target youth's best friends also participated in one assessment at age 20. We hypothesized that experiences of early adverse conditions (prior to age 5) would predict higher levels of psychopathology in target youth's best friends in young adulthood. We also hypothesized that greater levels of psychopathology in friends would in turn be associated with higher depressive symptoms in target youth, controlling for target youth's past depressive symptoms, and we explored whether this relationship was accounted for by youth chronic stress. Finally, we tested whether gender might moderate either of these relationships, given that depression becomes more common for females than males in adolescence (Hankin et al., 1998).

## Method

### Participants

Participants were youth who completed assessments for a longitudinal study at ages 15, 20, and once between ages 22 and 25, and who also nominated a best friend to participate in assessment at age 20. Participants were drawn from the Mater-University of Queensland Study of Pregnancy (MUSP; Keeping et al., 1989), a birth cohort study of children's development from pregnancy through age 5 including more than 7,000 children. A subset of 815 mother-child pairs were selected from this birth cohort study at youth age 15 for a follow-up study of children at risk for depressive and other disorders, based on mothers' reports of depressive symptoms on the Delusions-Symptoms States Inventory (DSSI; Bedford & Foulds, 1978) from pregnancy through child age 5. Families were selected to represent a range of symptom presence, chronicity, and severity of maternal depression, later verified by diagnostic interviews (see Hammen & Brennan, 2001 for details). The adolescent sample at age 15 was 50.4% male and 49.4% female. Families were largely lower and lower-middle income and predominantly Caucasian (91.4%; 3.6% Asian; 5% other or not reported).

At youth age 20, the mother-child pairs that participated at age 15 were again contacted for follow-up, and 705 (363 females) completed age 20 procedures. Of these 705 participants, 527 adolescents also nominated a peer to fill out questionnaires at the age 20 assessment. Of these 527 adolescents who nominated a peer to fill out questionnaires at the age 20 assessment, 252 (47.8%) nominated a romantic partner and 265 (50.3%) nominated a best friend. The remaining 10 participants nominated a sibling. Only characteristics of best friends were examined for the current study. Adolescents who nominated a best friend were significantly less likely than those who nominated a romantic partner to be in a romantic relationship ( $\chi^2(1, 517) = 256.98, p < .001$ ) and were more likely to be male ( $\chi^2(1, 517) = 5.98, p < .02$ ). However, there were no significant differences between adolescents who nominated a best friend and adolescents who nominated a romantic partner in terms of maternal depression history ( $\chi^2(1, 517) = 3.03, p = .08$ ), severity of peer internalizing symptoms ( $t(515) = .87, p = .38$ ), severity of peer externalizing symptoms ( $t(515) = .16, p = .87$ ), or severity of peer personality pathology symptoms ( $t(514) = .79, p = .43$ ).

When target youth were ages 22–25, they were contacted for a final follow-up and completed additional questionnaires. Of the 265 adolescents with best friend information at the age 20 assessment, 175 (94 females) participated in the age 22 assessment. The 175 youth with friend data included in the age 22–25 sample did not differ from the original sample (of 815 adolescents at age 15) in terms of maternal depression history ( $\chi^2(1, 815) = 2.70, p = .10$ ), gender ( $\chi^2(1, 815) = 1.67, p = .20$ ), youth experiences of early adversity by age 5 ( $t(814) = 1.05, p = .30$ ), youth depressive symptoms at age 15 ( $t(803) = .50, p = .62$ ), youth externalizing symptoms at age 15 ( $t(792) = -1.55, p = .12$ ), or youth total chronic stress at age 20 ( $t(703) = .76, p = .45$ ).

## Procedure

Mothers completed measures at 4 time points during the child's early life (at their first prenatal visit—typically in the first trimester of pregnancy, 3–4 days after the child's birth, 6 months after birth, age 5), and at youth ages 15 and 20. Children completed measures at ages 15, 20, and once between ages 22 and 25, and the best friends they nominated completed questionnaires at age 20. Questionnaires administered to mothers at time points prior to and including youth age 5 asked about maternal psychopathology, mothers' stress and social experiences, and family demographic information. Questionnaires and interviews administered to mothers and youth at youth ages 15, 20, and 22–25 asked about mother psychopathology, youth depressive symptoms, youth stress, and youth physical health. Questionnaires administered to best friends at youth age 20 asked about personality and psychopathology of the best friend. Participants all gave informed consent (assent) and the institutional review/ethics panels of the University of Queensland, Emory University, and the University of California, Los Angeles approved the research protocol for the ages 15, 20, and 22–25 follow-ups.

## Measures

**Early adversity**—A latent factor of early adversity was created using five indicators of stressful environments during the first five years of the child's life, based on information provided in the mother questionnaires at the 4 time points in early childhood. *Parental separation* was scored as present or absent based on mothers' reports of separating from her partner at any time during the first five years after the child's birth. *Financial hardship* was measured using an average of maternal ratings of the family's annual income (on a 7-point scale from 1 "\$0–\$15,000" through 7 "\$85,001 or more") at 3 of the early childhood assessments: pregnancy, 6 months after birth, and 5 years after birth. *Parental discord* was assessed using the mean of mothers' reports of relationship satisfaction on the 8-item satisfaction scale of the Dyadic Adjustment Scale (DAS; Spanier, 1976); alphas, .85 to .97) at all 4 early childhood assessments. *Maternal stress* was measured using a checklist of 9 interpersonal, health, or occupational problems that occurred over the past 6 months, which was administered to mothers once during pregnancy and once at the child's birth. Finally, *mothers' history of any Axis I diagnosis* (excluding specific phobia) between the child's birth and child age 5 was measured using the Structured Clinical Interview for DSM-IV for lifetime disorders (SCID; First, Spitzer, Gibbon, & Williams, 1995) administered to mothers at youth age 15. The most common diagnoses were major depressive disorder ( $n = 78$ ), dysthymic disorder ( $n = 68$ ), and social phobia ( $n = 34$ ). Descriptive statistics of these adversities, as well as Pearson and point-biserial correlations among individual early adversities, are presented in Table 1.

**Best friend psychopathology**—Psychopathology in the best friends of target youth at age 20 was measured using a latent variable indicated by three measures: internalizing symptoms, externalizing symptoms, and personality pathology. Friends' internalizing and externalizing symptoms were assessed using the Young Adult Self-Report (YASR; Achenbach, 1997), a well-validated self-report questionnaire designed to measure emotional and behavioral problems in young adults. Respondents rate how true various symptom descriptors are of themselves, ranging from 0 (not at all true) to 2 (very true or often true).

The current project utilized the sum of the Anxious/Depressed and Withdrawn subscales as a measure of friends' internalizing symptoms, and a sum of the Intrusive, Aggressive, and Delinquent subscales as a measure of externalizing symptoms.

Friends' personality pathology was measured using the Personality Diagnostic Questionnaire (PDQ; Hyler et al., 1988), a self-report questionnaire derived from the personality disorders section of the DSM-III. Each item on the PDQ is derived from the DSM-III diagnosis for a particular personality disorder and has been subjected to content analysis to ensure its face validity and consistency with DSM criteria. The PDQ has been shown to be a good indicator of overall personality disturbance, and distinguishes between individuals with high and low likelihood of personality disturbance, based on comparisons with clinician assessments of patients with and without personality disorder (Hyler et al., 1988). In the current project, the total index score of overall personality pathology was used.

**Youth depressive symptoms**—Target youth depressive symptoms at ages 20 and 22–25 were assessed using the Beck Depression Inventory—II (BDI-II; Beck, Steer, & Brown, 1996), a well-validated, self-report questionnaire. Coefficient alphas in the current sample were .93 for age 20 and .94 for ages 22–25.

**Youth chronic stress**—Target youth experiences with chronic stress across a number of domains were measured at age 20 using the UCLA Life Stress Interview, a semi-structured interview that probes stressful ongoing conditions across a number of life domains (Hammen & Brennan, 2001). The age 20 version of the interview probes several developmentally appropriate domains: social life, close friendship, romantic relationships, family relationships, financial, work, academic, health of self, and health of close family. For each domain, trained advanced graduate student interviewers used standard probes and semi-structured follow-up queries to make an objective rating of chronic stress on a 5-point scale (from “1” superior/exceptional functioning to “5” severe difficulties, using behaviorally anchored descriptors). Total chronic stress levels were computed by summing across all domains. Evidence of the convergent and predictive validity of the UCLA Life Stress Interview in the current sample is reported in Hammen, Brennan, & Keenan-Miller (2008). In the current sample, the mean intraclass correlation across all domains at age 20 was  $r = .81$ .

### Data Analytic Procedures

A structural equation modeling (SEM) framework was used to test the effects of early adversity on a latent factor of friend psychopathology, as well as the effects of friend psychopathology on youth depressive symptoms (see Figure 1). Follow-up analyses explored the unique role of each component of best friend psychopathology (internalizing symptoms, externalizing symptoms, and personality pathology) in the model. A second model, identical to the first, but also including youth chronic stress at age 20 as a covariate in predicting target youth depressive symptoms, was then tested. In all models, youth depressive symptoms at age 20 were included as a second pathway from early adversity to youth depressive symptoms at ages 22 to 25, in order to control for the effects of continuity of depression in target youth. Gender was controlled for in all paths of these models, due to

increased rates of depression in females across adolescence and adulthood (Hankin et al., 1998). Finally, the potential role of gender as a moderator of the first model was explored using multiple group analyses.

All analyses were carried out in Mplus v5 (Muthén & Muthén, 1998–2007), using full information maximum likelihood methods to accommodate missing data. Due to univariate and multivariate non-normality of the data, robust maximum likelihood procedures were used to estimate standard errors. Overall model fit was evaluated using several standard fit indices, including the likelihood ratio chi-square test, the comparative fit index (CFI; Bentler, 1990), the root-mean-square error of approximation (RMSEA; Browne & Cudeck, 1993), and the standardized root mean-square residual (SRMR; Hu & Bentler, 1998).

## Results

Descriptive statistics for all main study variables, as well as Pearson correlations among these variables, are presented in Table 2. Both covariates, youth depressive symptoms at age 20 ( $r = .55, p < .001$ ) and youth chronic stress at age 20 ( $r = .32, p < .001$ ) were significantly correlated with youth depressive symptoms at ages 22–25.

Results from the SEM analyses, including standardized beta values, are presented in Figure 1.<sup>1</sup> Fit indices indicated that overall the hypothesized model provided a good fit to the data ( $\chi^2$  (df = 40,  $N = 816$ ) = 70.41,  $p < .01$ ; CFI = .97; RMSEA = .03 (90% CI .02, .04); SRMR = .04. Factor loadings for parental separation ( $\beta = .75, p < .001$ ), maternal psychopathology ( $\beta = .41, p < .001$ ), parental discord ( $\beta = .59, p < .001$ ), maternal stress ( $\beta = .56, p < .001$ ), and financial hardship ( $\beta = .60, p < .001$ ) provided evidence that these variables were indicators of a single latent factor of early adversity. Factor loadings for peer internalizing symptoms ( $\beta = .76, p < .001$ ), externalizing symptoms ( $\beta = .66, p < .001$ ), and personality pathology ( $\beta = .94, p < .001$ ) provided evidence that these variables were indicators of a single latent factor of peer psychopathology. Early adverse experiences by age 5 had a significant indirect effect on depressive symptoms at ages 22 to 25, via depressive symptoms at age 20 ( $\beta = .12, p < .001$ ), and the indirect path from early adverse experiences by age 5 to depressive symptoms at ages 22 to 25 via best friend psychopathology was marginally significant ( $\beta = .04, p = .06$ ).

In addition, all hypothesized direct paths in the model were found to be significant. Experiences of early adversity by age 5 predicted having a best friend with higher levels of psychopathology at age 20, over and above the effects of gender ( $\beta = .26, p < .001$ ). Having a best friend with elevated rates of psychopathology at age 20 in turn predicted higher depressive symptoms for the target individual over the next two to five years, controlling for gender and target depressive symptoms at age 20 ( $\beta = .17, p < .01$ ).

Additional exploratory analyses examined the roles of the individual components of best friend psychopathology in the model. Best friend internalizing symptoms ( $\chi^2$  (df = 24,  $N =$

<sup>1</sup>All models were also run with an alternative composite variable of early adversity, which was created by standardizing continuous early adversities and summing across adversities. Models using this early adversity composite variable showed identical fit and patterns of significance to models using the latent variable of early adversity.

816) = 46.39,  $p < .01$ ; CFI = .96; RMSEA = .03 (90% CI .02, .05); SRMR = .04; indirect path:  $\beta = .04$ ,  $p = .08$ ) and personality pathology ( $\chi^2$  (df = 24,  $N = 816$ ) = 49.92,  $p < .01$ ; CFI = .96; RMSEA = .04 (90% CI .02, .05); SRMR = .04; indirect path:  $\beta = .04$ ,  $p = .06$ ) served as marginally significant pathways from early adverse experiences to later youth depressive symptoms, with these models showing similar fit and patterns of significance as the latent factor of best friend psychopathology. In contrast, best friend externalizing symptoms did not have a unique direct effect on youth depressive symptoms at ages 22 to 25 ( $\beta = .03$ ,  $p = .67$ ).

A second model was then run controlling for youth chronic stress at age 20 in predicting youth depressive symptoms at ages 22–25 from best friend psychopathology. Importantly, results showed that higher rates of psychopathology in best friends continued to significantly predict target youth depressive symptoms over the next two to five years ( $\beta = .16$ ,  $p < .05$ ), although youth chronic stress was also a significant predictor of later depressive symptoms ( $\beta = .11$ ,  $p < .05$ ).

Finally, the potential role of gender as a moderator of the effects of early adversity on friend psychopathology, as well as the effects of friend psychopathology on increases in depressive symptoms, was examined. Multiple group analyses suggested that neither the effects of early adversity on friend psychopathology (Wald  $\chi^2$  (1) = .86,  $p = .35$ ) nor the effects of best friend psychopathology on later youth depressive symptoms (Wald  $\chi^2$  (1) = .06,  $p = .81$ ) differed significantly by gender.

## Discussion

The current study used a prospective, longitudinal dataset in order to explore the long-term effects of experiences of early adversity on characteristics of individuals' best friends in young adulthood, and the implications of these best friendships for young adults' own depressive symptoms. Findings indicate that individuals who have been exposed to a cluster of adverse early life experiences, including maternal psychopathology and a number of associated stressful conditions, have best friends with elevated levels of psychopathology in young adulthood. Having best friends with elevated rates of psychopathology, particularly internalizing and personality pathology, in turn predicts higher depressive symptoms for target individuals over the next two to five years.

These results highlight that individuals who have experienced early adversity, especially this cluster of early stressors associated with maternal psychopathology, might be more likely to select into best friendships with more psychologically distressed others in young adulthood. A large body of evidence suggests that individuals who have experienced early adversity show increased social difficulties in interactions with peers, particularly in childhood. Children who have experienced early life stress are more likely to exhibit problematic behaviors in social interactions with peers (e.g., Bolger & Patterson, 2001; Teisl & Cicchetti, 2007) and to rate their friendships as higher in negative qualities and lower in positive qualities (e.g., McCloskey & Stuewig, 2001). However, little research has examined whether these social difficulties also exist in adulthood. The current findings therefore address current gaps in the literature by showing that individuals who have experienced

early adversity have involvement with peers suffering from psychological distress throughout adolescence and young adulthood.

The specific mechanisms that accounted for individuals' selection into friendships marked by higher psychopathology in the current study were not able to be tested. However, it might be speculated that individuals exposed to early adversity continue to show interpersonal dysfunction in close relationships for several reasons. First, these individuals are more likely to exhibit problematic social behaviors that lead to rejection by normally functioning peers (Bolger & Patterson, 2001; Fantuzzo et al., 1998). Thus, it is possible that individuals who have experienced adversity and have subsequent social difficulties tend to be de-selected by normally functioning peers and therefore select into friendships with problematic peers. In addition, similarity-attraction theory suggests that individuals tend to select friends who have similar attitudes and behaviors, because this facilitates communication and understanding (Berger & Calabrese, 1975; Byrne & Nelson, 1965). As a result, individuals who have experienced adversity might be more likely to struggle with problematic social behaviors, such as aggression or withdrawal, and in turn select friends who exhibit similar behaviors. Finally, individuals who have experienced early adversity might be more likely to suffer from higher levels of psychopathology themselves, and friends' rates of internalizing and externalizing symptoms might become more similar over time as a result of influence processes (Howes et al., 1985; Rosenquist et al., 2010; Stevens & Prinstein, 2005). That is, individuals who have been exposed to early adversity might exhibit more internalizing and externalizing symptoms that over time increase their friends' levels of psychopathology. Further research is needed to explore these specific mechanisms by which experiences of early adversity might lead individuals to become involved in problematic friendships.

The current results also showed that close friends' elevated rates of psychopathology in young adulthood were associated with higher levels of depressive symptoms in target individuals over the next five years, controlling for past youth depressive symptoms and youth chronic stress. In addition, the indirect effect of early adversity on later youth depressive symptoms was marginally significant, providing tentative support for best friend psychopathology as one pathway for the effects of early adversity on later depression. This finding is consistent with the fact that friendships with peers become increasingly salient during adolescence and young adulthood (Brown, 1990; Parker et al., 2006). Because close friends become a primary source of social and emotional support in young adulthood, psychopathology within friendships can have a significant impact on mental health. Results are also consistent with theories of stress generation, which posits that individuals at-risk for depression, or other psychopathology, as a result of early adverse conditions, might create or select themselves into potentially problematic circumstances that provoke future depression (Hammen, Brennan, & LeBrocque, 2011; Katz, Hammen, & Brennan, 2013).

However, it is unclear from the present findings exactly why friends' psychopathology might be related to depressive symptomatology. Interestingly, youth chronic stress across a number of domains (including social ones) did not fully account for the relationship between friend psychopathology and depressive symptoms. Thus, although friends' psychopathology might lead to increased conflict or decreased support in close friendships, it appears that other factors are also playing a role in predicting depression in the target individual. It is

possible that processes within close friendships, such as co-rumination, might lead internalizing symptoms to be “contagious.” This contagion hypothesis is consistent with the fact that exploratory analyses showed peer internalizing symptoms were predictive of target youth depressive symptoms, while peer externalizing symptoms were not. It is less clear why peer personality pathology was also uniquely predictive of target depressive symptoms, but it is possible that depression-like personality symptoms, such as social isolation or suicidality, could account for this finding. Third variables that affect both friends, such as a stressful school or neighborhood context, might also contribute to psychopathology in both the target individual and his/her friend. Finally, it is possible that early adverse experiences lead to affect dysregulation and behavioral problems in the target individual that contribute both to selecting friends with psychopathology and increasing depression over time.

Gender moderation analyses indicated that neither path in the model was significantly different for males versus females. These results are somewhat surprising, given that reciprocity in close relationships tends to be more valued for adolescent girls than boys (Parker & Asher, 1993), and female best friends tend to engage in excessive disclosure and co-rumination, which can promote increased contagion of internalizing symptoms among female best friends (Rose, 2002; Stevens & Prinstein, 2005). Moreover, depressive symptoms tend to increase more dramatically for females than for males throughout adolescence (Nolen-Hoeksema & Girgus, 1994). Thus, future research should further examine the specific mechanisms by which gender might moderate peer selection and/or socialization, as well as the impact of qualities of best friendships on individuals’ emotional functioning.

Several limitations of the current study should be noted. First, the current dataset did not allow us to explore the trajectory of psychopathology in both target individuals and their best friends over time. In addition, the current sample suffered from a relatively high rate of attrition, given the longitudinal nature of the study. Although completers and dropouts did not differ on major variables of relevance, it is possible that variables not measured in the current study might have been correlated with attrition. For example, individuals without close peer relationships might have been more likely to drop out before the age 20 assessment involving peer questionnaires. The present study also utilized a community sample that was over-selected for maternal depression. This selection process provided some unique advantages for our analyses. First, we were better able to examine the presence of maternal psychopathology as an early adverse environment. Second, this sample gave us insight into predictors of elevated depressive symptoms in offspring, a common problem in offspring of depressed mothers. Nevertheless, future research should examine the effects of early adversities on young adults’ friendships and depressive symptoms in other samples that are more representative of the general population. Finally, the current sample was also limited in terms of both ethnic and socioeconomic diversity due to the population served by the Mater Hospital, as well as the Australian general population of that era (born in 1980’s). As a result, findings should be interpreted in light of these limitations, and should be replicated in more ethnically and socioeconomically diverse populations.

Despite these limitations, the present study highlights selection into close friendships with youth who have elevated levels of psychopathology as one pathway by which exposure to

early stressful conditions might have long-term effects on youth mental health. Findings indicate that for individuals who have experienced maternal psychopathology and other related early adversities, social difficulties can persist far beyond childhood and influence the course of later depressive symptoms. These results have important implications for clinical interventions designed to prevent the development depressive symptoms. For example, psychosocial interventions that target functioning in close friendships during the transition to adulthood might be particularly important for individuals at risk for depressive symptoms due to experiences of early adversity.

Future research might benefit from exploring other aspects of friendships, such as closeness, conflict, and communication styles, as potential mechanisms of the effects of early adversity on risk for depression. In addition, it will be important for future work to consider potential moderators of the effects of early adversity on functioning in close friendships. For example, a close relationship with a parent or other family member early in life might buffer the negative effects of early adversity on later social functioning. Identifying these mechanisms and moderators of the effects of early adversity on later relationships with peers could in turn aid in the development of more targeted interventions to prevent the development of depression in at-risk youth.

## Acknowledgements

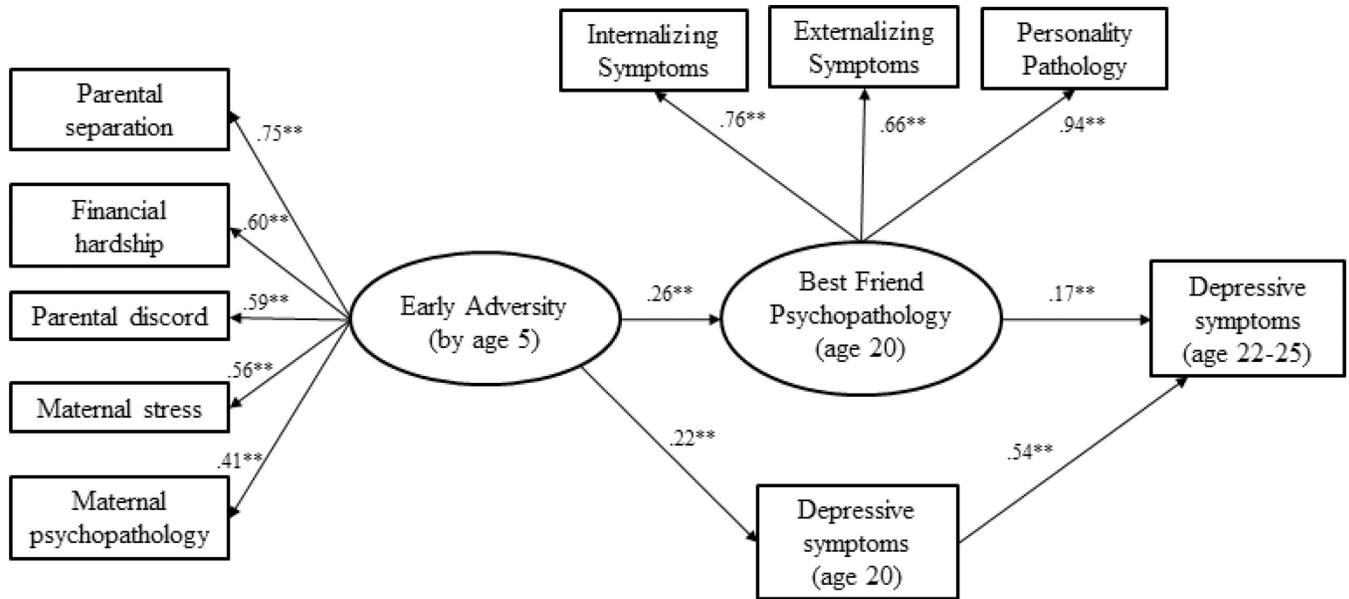
This research was supported by the National Health and Medical Research Council, the Mater Misericordiae Mother's Hospital in Queensland, Australia, NIMH grant R01 MH52239, and an NIMH training grant MH15750 awarded to Elizabeth Raposa. We thank Professor Jake Najman of the University of Queensland and MUSP colleagues William Bor, M.D., and Gail Williams, Ph.D. Special thanks to project coordinators Robyne LeBrocq, Cheri Dalton Comber, and Sascha Hardwicke.

## References

- Achenbach, TM. Manual for the Young Adult Self-Report and Young Adult Behavior Checklist. Burlington: University of Vermont Department of Psychiatry; 1997.
- Beck, AT.; Steer, RA.; Brown, GK. Beck Depression Inventory-II (BDI-II). San Antonio, TX: Psychological Corporation; 1996.
- Bedford, A.; Foulds, G. Manual of the Delusions-Symptoms-States Inventory (DSSI). NFER, Windsor; 1978.
- Bentler PM. Comparative fit indexes in structural models. *Psychological Bulletin*. 1990; 107(2):238–246. [PubMed: 2320703]
- Berger CR, Calabrese RJ. Some explorations in initial interaction and beyond: Toward a developmental theory of interpersonal communication. *Human Communication Research*. 1975; 1(2):99–112.
- Bolger KE, Patterson CJ. Developmental pathways from child maltreatment to peer rejection. *Child Development*. 2001; 72:549–568. [PubMed: 11333084]
- Brown, BB. Peer groups and peer culture. In: Feldman, SS.; Elliott, GR., editors. *At the Threshold: The Developing Adolescent*. Cambridge, MA: Harvard University Press; 1990. p. 171-196.
- Browne MW, Cudeck R. Alternative ways of assessing model fit. *Testing Structural Equation Models*. 1993; 154:136–162.
- Byrne D, Nelson D. Attraction as a linear function of proportion of positive reinforcements. *Journal of Personality and Social Psychology*. 1965; 1(6):659–663. [PubMed: 14300244]
- Dong M, Anda RF, Felitti VJ, Dube SR, Williamson DF, Thompson TJ, Loo CM, Giles WH. The interrelatedness of multiple forms of childhood abuse, neglect, and household dysfunction. *Child Abuse & Neglect*. 2004; 28:771–784. [PubMed: 15261471]

- Fantuzzo JW, Weiss AD, Atkins M, Meyers R, Noone M. A contextually relevant assessment of the impact of child maltreatment on the social competencies of low-income urban children. *Journal of the American Academy of Child and Adolescent Psychiatry*. 1998; 37:1201–1208. [PubMed: 9808932]
- Finkelhor D, Ormrod RK, Turner HA. Poly-victimization: A neglected component in child victimization. *Child Abuse & Neglect*. 2007; 31:7–26. [PubMed: 17224181]
- First, MB.; Spitzer, RL.; Gibbon, M.; Williams, JBW. Structured Clinical Interview for DSM-IV Axis I Disorders: Patient Edition (SCIDI/P. Version 2.0). New York, NY: New York State Psychiatric Institute; 1995.
- Green JG, McLaughlin KA, Berglund PA, Gruber MJ, Sampson NA, Zaslavsky AM, Kessler RC. Childhood adversities and adult psychopathology in the National Comorbidity Survey Replication (NCS-R) I: Associations with first onset of DSM-IV disorders. *Archives of General Psychiatry*. 2010; 67(2):1–21.
- Hammen C. Generation of stress in the course of unipolar depression. *Journal of Abnormal Psychology*. 1991; 100:555–561. [PubMed: 1757669]
- Hammen C. Stress and depression. *Annual Review of Clinical Psychology*. 2005; 1:293–319.
- Hammen C, Brennan PA. Depressed adolescents of depressed and nondepressed mothers: tests of an interpersonal impairment hypothesis. *Journal of Consulting and Clinical Psychology*. 2001; 69(2): 284–294. [PubMed: 11393605]
- Hammen C, Brennan PA, Keenan-Miller D. Patterns of adolescent depression to age 20: The role of maternal depression and youth interpersonal dysfunction. *Journal of Abnormal Child Psychology*. 2008; 36(8):1189–1198. [PubMed: 18473162]
- Hammen C, Brennan P, Le Brocque R. Youth depression and early childrearing: Stress generation and intergenerational transmission of depression. *Journal of Consulting and Clinical Psychology*. 2011; 79:353–363. [PubMed: 21517152]
- Hankin BL, Abramson LY, Moffitt TE, Silva PA, McGee R, Angell KE. Development of depression from preadolescence to young adulthood: emerging gender differences in a 10-year longitudinal study. *Journal of Abnormal Psychology*. 1998; 107(1):128. [PubMed: 9505045]
- Howe RT, Parke RD. Friendship quality and sociometric status: Between-group differences and links to loneliness in severely abused and nonabused children. *Child Abuse & Neglect*. 2001; 25:585–606. [PubMed: 11428423]
- Howes MJ, Hokanson JE, Loewenstein DA. Induction of depressive affect after prolonged exposure to a mildly depressed individual. *Journal of Personality and Social Psychology*. 1985; 49(4):1110–1113. [PubMed: 4057047]
- Hu L, Bentler PM. Fit indices in covariance structural equation modeling: Sensitivity to underparameterized model misspecification. *Psychological Methods*. 1998; 3:424–453.
- Hyler SE, Rieder RO, Williams JB, Spitzer RL, Hendler J, Lyons M. The Personality Diagnostic Questionnaire: development and preliminary results. *Journal of Personality Disorders*. 1988; 2(3): 229–237.
- Katz SJ, Hammen CL, Brennan PA. Maternal depression and the intergenerational transmission of relational impairment. *Journal of Family Psychology*. 2013; 27(1):86–95. [PubMed: 23421836]
- Keenan-Miller D, Hammen C, Brennan P. Adolescent psychosocial risk factors for severe intimate partner violence in young adulthood. *Journal of Consulting and Clinical Psychology*. 2007; 75(3): 456–463. [PubMed: 17563162]
- Keeping JD, Najman JM, Morrison J, Western JS, Andersen MJ, Williams GM. A prospective longitudinal study of social, psychological and obstetric factors in pregnancy: response rates and demographic characteristics of the 8556 respondents. *BJOG: An International Journal of Obstetrics & Gynaecology*. 1989; 96(3):289–297.
- Kerns KA, Klepac L, Cole AK. Peer relationships and preadolescents' perceptions of security in the child–mother relationship. *Developmental Psychology*. 1996; 32:457–466.
- Kessler RC, Magee WJ. Childhood family violence and adult recurrent depression. *Journal of Health and Social Behavior*. 1994; 35:13–27. [PubMed: 8014427]

- Kim J, Cicchetti D. Longitudinal pathways linking child maltreatment, emotion regulation, peer relations, and psychopathology. *Journal of Child Psychology and Psychiatry*. 2010; 51(6):706–716. [PubMed: 20050965]
- Liu RT, Alloy LB, Abramson LY, Iacoviello BM, Whitehouse WG. Emotional maltreatment and depression: prospective prediction of depressive episodes. *Depression and Anxiety*. 2009; 26(2): 174–181. [PubMed: 19152341]
- McCloskey LA, Stuewig J. The quality of peer relationships among children exposed to family violence. *Development and Psychopathology*. 2001; 13:83–96. [PubMed: 11346054]
- Mullen PE, Martin JL, Anderson JC, Romans SE, Herbison GP. The long-term impact of the physical, emotional, and sexual abuse of children: a community study. *Child Abuse & Neglect*. 1996; 20(1): 7–21. [PubMed: 8640429]
- Muthén, LK.; Muthén, BO. *Mplus User's Guide*. 5th edition. Los Angeles, CA: Author; 1998–2007.
- Nanni V, Uher R, Danese A. Childhood maltreatment predicts unfavorable course of illness and treatment outcome in depression: a meta-analysis. *American Journal of Psychiatry*. 2012; 169(2): 141–151. [PubMed: 22420036]
- Nolen-Hoeksema S, Girgus JS. The emergence of gender differences in depression during adolescence. *Psychological Bulletin*. 1994; 115(3):424. [PubMed: 8016286]
- Ornduff SR, Kelsey RM, O'Leary KD. Childhood physical abuse, personality, and adult relationship violence: A model of vulnerability to victimization. *American Journal of Orthopsychiatry*. 2001; 71(3):322–331. [PubMed: 11495334]
- Parker JG, Asher SR. Friendship and friendship quality in middle childhood: Links with peer group acceptance and feelings of loneliness and social dissatisfaction. *Developmental Psychology*. 1993; 29(4):611.
- Parker, JG.; Rubin, KH.; Erath, S.; Wojslawowicz, JC.; Buskirk, A. Peer relationships, child development, and adjustment: A developmental psychopathology perspective. In: Cicchetti, D., editor. *Developmental Psychopathology: Vol. 2. Risk, disorder, and adaptation*. New York: Wiley; 2006. p. 419-493.
- Prinstein MJ, Meade CS, Cohen GL. Adolescent oral sex, peer popularity, and perceptions of best friends' sexual behavior. *Journal of Pediatric Psychology*. 2003; 28(4):243–249. [PubMed: 12730281]
- Rose AJ. Co-rumination in the friendships of girls and boys. *Child Development*. 2002; 73(6):1830–1843. [PubMed: 12487497]
- Rosenquist JN, Fowler JH, Christakis NA. Social network determinants of depression. *Molecular Psychiatry*. 2010; 16(3):273–281. [PubMed: 20231839]
- Rudolph KD, Hammen C, Burge D, Lindberg N, Herzberg D, Daley SE. Toward an interpersonal life-stress model of depression: The developmental context of stress generation. *Development and Psychopathology*. 2000; 12(2):215–234. [PubMed: 10847625]
- Schilling EA, Aseltine RH, Gore S. Adverse childhood experiences and mental health in young adults: A longitudinal survey. *BMC Public Health*. 2007; 7(30):1–10. [PubMed: 17199891]
- Spanier GB. Measuring dyadic adjustment: New scales for assessing the quality of marriage and similar dyads. *Journal of Marriage and the Family*. 1976; 38:15–28.
- Stevens EA, Prinstein MJ. Peer contagion of depressogenic attributional styles among adolescents: A longitudinal study. *Journal of Abnormal Child Psychology*. 2005; 33(1):25–37. [PubMed: 15759589]
- Teisl M, Cicchetti D. Physical abuse, cognitive and emotional processes, and aggressive/disruptive behavior problems. *Social Development*. 2007; 17:1–23.
- Van Lieshout, CF.; Cillessen, AH.; Haselager, GJ. Interpersonal support and individual development. In: Collins, WA.; Laursen, BP., editors. *Relationships as Developmental Contexts*. Psychology Press; 1999. p. 37-55.
- Van Zalk MHW, Kerr M, Branje SJT, Stattin H, Meeus WHJ. It takes three: Selection, influence, and de-selection processes of depression in adolescent friendship networks. *Developmental Psychology*. 2010; 46:927–938. [PubMed: 20604612]



\* $p \leq .05$ , \*\* $p \leq .01$

**Figure 1.**

The effects of early adversity by age 5 on psychopathology in best friends' psychopathology at age 20, and the effects of best friends' psychopathology on target individuals' depressive symptoms 2 to 5 years later. Gender is controlled for in all paths, and youth depressive symptoms at age 20 were included as an additional mediational pathway to control for their effects on later depressive symptoms.

**Table 1**

## Correlation Matrix of Early Adversity Measures

Study Variable	M	SD	Range	1	2	3	4	5
1. Parental separation	0.22	0.42	0-1	--				
2. Maternal psychopathology	0.28	0.45	0-1	.22**	--			
3. Marital satisfaction	40.9	4.8	19.75-50	-.38**	-.021**	--		
4. Maternal stress	2.93	2.68	0-12	.27**	.17**	-.41**	--	
5. Family income	4.18	0.98	1.67-7	-.36**	-.018**	.29**	-.33**	--

Correlation Matrix of Early Adversity, Peer Psychopathology, Depressive Symptoms, and Chronic Stress

Table 2

Study Variable	M	SD	Range	1	2	3	4	5	6
1. Early adversity (by age 5)	.46	2.45	-5.1–9.8	--					
2. Peer internalizing symptoms (age 20)	12.36	8.12	0–47	.20**	--				
3. Peer externalizing symptoms (age 20)	10.12	6.45	0–29	.12*	.49**	--			
4. Peer personality symptoms (age 20)	26.70	12.89	1–63	.16**	.71**	.62**	--		
5. Depressive symptoms (age 20)	7.05	8.40	0–52	.17**	.17**	.09	.13*	--	
6. Depressive symptoms (ages 22–25)	7.64	8.52	0–45	.18**	.18*	.05	.20**	.55**	--
7. Chronic stress (age 20)	22.59	4.52	12–39.5	.23**	.11	.06	.14*	.48**	.32**

Note.

\*  $p < .05$ ,

\*\*  $p < .01$

Note. Correlations with early adversity were calculated using the alternative early adversity composite, which was created by standardizing continuous early adversity variables and then summing across all 5 early adversities.