



HHS Public Access

Author manuscript

Eur Child Adolesc Psychiatry. Author manuscript; available in PMC 2016 July 01.

Published in final edited form as:

Eur Child Adolesc Psychiatry. 2015 July ; 24(7): 815–826. doi:10.1007/s00787-014-0626-8.

Childhood friendships and psychological difficulties in young adulthood: an 18 year follow-up study

Kwame S. Sakyi¹, Pamela J. Surkan¹, Eric Fombonne², Chollet^{3,4}, and Maria Melchior^{3,4}

¹Social and Behavioral Interventions Program, Dept. of International Health, Johns Hopkins Bloomberg School of Public Health, 615 N. Wolfe, Street, Baltimore, Maryland, 21205, USA; ksakyi@jhsph.edu and psurkan@jhsph.edu; phone: 410-502-7396, fax: 410-502-6733

²Oregon Health & Science University, Department of Psychiatry, Portland, Oregon, USA

³INSERM, Centre for Research in Epidemiology and Population Health (CESP), U1018, Epidemiology of occupational and social determinants of health, F-94807, Villejuif, France

⁴Univ Versailles St-Quentin, F-78035, Versailles, France

Abstract

Childhood friendships have been shown to impact mental health over the short-term, however, it is unclear whether these effects are sustained into young adulthood. We studied the prospective association between childhood friendships and psychological difficulties in young adulthood. Data come from 1103 French 22–35 year olds participating in the TEMPO study. Childhood friendships were ascertained in 1991 when participants were 4–16 years old. Psychological difficulties were measured in 2009 using the Adult Self-Report. Logistic regression models controlled for participants' age, sex, childhood psychological difficulties and parental characteristics. Young adults who had no childhood friends had higher odds of psychological difficulties than those with at least one friend: (adjusted ORs: 2.45; 95% CI: 1.32–4.66, $p=0.01$ for high internalizing symptoms; 1.81; 95% CI: 0.94–3.54, $p=0.08$ for high externalizing symptoms). Social relations early in life may have consequences for adult psychological well-being.

Keywords

Internalizing symptoms; Externalizing symptoms; childhood; Young adulthood; Friendship; Social support; Social network

INTRODUCTION

Psychological difficulties, such as internalizing symptoms (i.e. depression, anxiety, psychosomatic complaints) and externalizing symptoms (i.e. aggression, hyperactivity and inattention) are common in youth and can have a negative impact on concurrent and later

Corresponding author: Social and Behavioral Interventions Program, Dept. of International Health, Johns Hopkins Bloomberg School of Public Health, 615 N. Wolfe Street, Baltimore, Maryland, 21205, USA; ksakyi@jhsph.edu and psurkan@jhsph.edu; phone: 410-502-7396, fax: 410-502-6733.

The authors declare they have no conflicts of interest.

academic, occupational, and social development, as well as health [1–4]. As early as in childhood, the presence and degree of psychological difficulties are associated with individuals' peer relations with others [5,6].

The number of close individuals one has is a dimension of social relations shown to be related to psychological adjustment and well-being [7,8]. In childhood and adolescence, friendships offer an environment in which children are able to develop social competencies and build their self-esteem[9], skills that are essential for good mental health throughout life [9,10]. Moreover, friends can be a source of emotional and instrumental support, and help youth access different types of material and symbolic resources that favor well-being [2,11].

Research has shown that friendship predicts psychological well-being over the short term [7,12,13]. However, studies with a longer time frame have been scarce, with few exceptions [3, 4]. For internalizing symptoms, Pedersen et al. followed a diverse sample of 14 year olds over an 8 year period in Canada. Based on reciprocal peer nominations, they found that adolescents who did not have a mutual friend at baseline were more likely to experience depression and loneliness at 8 years follow-up [14]. Earlier, Bagwell et al. followed a small sample of American fifth graders over a 13 year period. At follow up, they showed high rates of clinical depression among those who had no mutual preadolescent friend compared to those who had. Bagwell et al. used having a problem with the law in young adulthood as a proxy measure of externalizing problems (mainly aggression). They did not find preadolescent friendship to be a predictor of having problem with the law in young adulthood, after adjusting for childhood aggression [9]. This work was, however, limited by a small sample size and lower participation from males.

Much of our knowledge about children's social relations and long-term psychological well-being has come from research on peer status [15,16]. Peer status captures whether a child or adolescent is accepted or rejected by his or her peers [7]. While peer status overlaps conceptually with friendship—a child who is more accepted is likely to have a friend and vice versa—they occupy different domains of social relations and appear to affect different aspects overall well-being [7].

Also understudied is whether the *quantity* of friends a child has affects long-term mental health. Different dimensions of friendship—whether the child has a friend, the number of friends the child has, and the quality of the friendship—have unique contributions to overall adjustment [7,17]. The importance of the quality of friendships with regard to children's adjustment has been well documented [18,19]. What remains further to be determined is the effect of the number of friends on adjustment, as the results in the literature have been mixed. For example, Ladd et al. showed that friendship quantity of kindergartners did not predict internalizing symptoms (specifically depression and loneliness), after four months of follow up; it however affected their school adjustment and academic readiness [20]. Waldrip et al., on the other hand, found that having few friends was related to internalizing symptoms and social problems, but not externalizing symptoms, among children in fifth through eighth grade who were followed up for seven months [19]. Differences in methodology in assessing psychological difficulties and participants' age may explain the different findings. As a limitation, both studies had short follow-up time. In addition,

Waldrip et al.'s analysis excluded participants who did not have friends. Given the research to date, it is unclear if the number of friends is related to psychological difficulties later on in life, particularly externalizing symptoms.

A related issue deals with the pathways that link the number of friends in childhood and adolescence to both internalizing and externalizing problems in young adulthood. Number of friends is an indicator of children's social networks. The structure of individuals' social network, as conceptualized by Berkman et al., affects psychological health and behavioral practices through four, not mutually exclusive, pathways: 1) provision of social support; 2) social engagement and attachment; 3) social influence; and 4) access to resources and material goods [21]. The ways in which one's social network (in this case friendship) is related to externalizing problems, as Berkman et al. note, is less clear than for internalizing symptoms [21].

First, the size of one's friendship network provides more opportunities to access different aspects of social support (material, emotional, instrumental and appraisal) to help individuals deal with life stressors [21]. Kahn and Antonucci's *convoy model* suggests that while the structure of a network may change, social support is maintained through this network of relationships over time. The model posits that people learn to establish relations with others early on and that interaction patterns are established in childhood [22]; thus, earlier friendships can facilitate social support later in life. Among young adults, a significant part of their social support comes from their friends [23]. The ability of social support to reduce the experience of internalizing symptoms, particularly depression, is well supported in the literature [21].

Second, the size of one's friendship network allows individuals to participate in social activities and interact with more people. These activities and interactions solidify social roles and identity. Defined roles and identity in turn provide a sense of worth, confidence, connection, and attachment, which are thought to mediate development of later psychological difficulties [21]. In later childhood, the number of friends one has is positively correlated with leadership and sociability, such as being a class leader and not being left out of peer activities [24]. This stems from the strong relationship between having more friends and being liked by peers [19]. More friendships offer children and adolescents leadership and social opportunities that determine their self-worth and define their identity [10].

Third, the size of one's friendship network enhances or constrains access to resources and material goods [21]. In Sweden, Almqvist found that one way in which the number of childhood friends affects physical health in adulthood is through adult socio-economic status [25]. Adults who have more friends are more likely to be employed than those who have few friends [25]. Friendships allow access to resources and goods that can improve one's socio-economic status. This is consistent with empirical findings that peer relations may affect later health either directly or indirectly through adult circumstances [26].

The pathway through social influence may be more relevant to externalizing symptoms. Friendships create opportunities for children and adolescents to develop social and interpersonal skills. For children who are aggressive, a larger friendship network could

provide more opportunities early on to receive corrective feedback when they misinterpret actions as hostilities towards them. Repeated corrections would provide an environment for learning interpersonal skills, thereby reducing children's tendencies to be aggressive [27,28]. These early influences and the social competencies they produce are thought to persist over time [10]. Relatedly, making more friends in childhood and adolescence reflects individual interpersonal and social skills, which are thought to mirror later social relations (such as marriage) or competence in the work place [9,25]. For example, Almquist found that adults with fewer friends in childhood were less likely than those with more friends to be married and employed [25]. Difficult relationships with others are a key aspect of many types of psychological difficulties and often persist even after symptoms have decreased [29].

The role of social influence on externalizing symptoms is not always positive, particularly when friendships are formed among children or adolescents with similar behavioral problems [11]. Dishion et al. have shown through the concept of deviancy training that affiliation with others who have similar behavioral problems facilitates discourse about and modeling of anti-social behavior [30]. Such social interactions have been demonstrated to promote the onset and development of conduct problems [30–33], including externalizing symptoms [32,34]. Thus, the more friends a child or adolescent has who are aggressive, the greater this social influence supports aggressive behavior [32] and the more likely it is that those friendships may lead to externalizing behaviors. [35].

This current paper fills an important gap in the literature. We are not aware of other research that has explored this relation between quantity of friends and long-term mental health, particularly on externalizing symptoms in young adulthood. We test the longitudinal association between childhood friendships and internalizing as well as externalizing symptoms over an 18 years follow-up period in a community sample of young adults. We hypothesized that young adults who did not have close childhood friends compared to those who had at least one friend would have elevated odds of experiencing internalizing, as well as externalizing symptoms in young adulthood. Based on the observation that social support has been negatively associated with depression [21] and anxiety [36], we anticipated a stronger association between having friends and internalizing symptoms over the long-term. Because social relations can either accentuate or lessen behaviors like aggression and delinquency, depending on whether the friends also display these behaviors [37,38], we expected a weaker association with externalizing symptoms. We also hypothesized, based on the important role of social networks on psychological health that having a larger number of friends will be negatively related to both internalizing and externalizing symptoms.

METHODS

Participants

Data come from The Trajectoires Épidémiologiques en Population study based in France, which was established in 2009 among young adults (aged 22–35 years) whose parents participate in the GAZEL Cohort Study initiated in 1989 [39].

Procedure

A detailed description of the study procedures have been described elsewhere [40]. Briefly, in 1991, all TEMPO study participants took part in the GAZEL Youth Study, which examined childhood mental health problems and access to health care. The study sample is comparable to French children of the same age in terms of family composition and socio-economic position [40]. In 1991 also the participants' parents completed the Child Behavioral Checklist (CBCL) [41] and reported on their children's friendships. In 2009, a total of 2,498 participants from the GAZEL Youth Study were mailed a TEMPO study questionnaire via their parents. The participants self-completed the Adult Self-Report (ASR) [42] which included measures on internalizing and externalizing symptoms. 1,103 individuals completed the TEMPO study questionnaire (44.5% response rate). Four were too sick to participate and 16 had died since 1991. This response rate is similar to other mental health studies that have been conducted in France [43]. Reasons for non-response were obtained through both the GAZEL Cohort Study and TEMPO study. The main reasons associated with non-participation were the parents' not forwarding the questionnaire to their offspring and young adults' lack of interest in the study.

Compared to those who did not respond, study participants were more likely to be female ($p < 0.0001$), come from families that had high socio-economic background ($p < 0.0001$) and had low divorce rates ($p = 0.004$). The overall psychological characteristics of non-participants and participants did not differ ($p = 0.26$). Additionally, the TEMPO sample includes individuals with higher socioeconomic position than the general population of young adults in France, although their level of unemployment is nationally representative [40]. The TEMPO study received approval from the French National Committee for Data Protection (CNIL: Commission Nationale Informatique et Liberté; CCTIRS: Comité Consultatif pour le Traitement des Informations pour la Recherche en Santé), which guarantees ethical data collection and use in France.

Measures

Participants' psychological difficulties – internalizing and externalizing symptoms – were assessed using the previously validated ASEBA system (Achenbach System of Empirically-Based Assessment) [44]. Childhood psychological difficulties were assessed through parental completion of the Child Behavioral Checklist (CBCL) in 1991. The CBCL included 31 items on childhood internalizing symptoms (e.g. symptoms of depression/anxiety, withdrawal and psychosomatic symptoms) and 32 items on childhood externalizing symptoms (e.g. aggressive and rule-breaking behavior). In 2009, participants self-completed the Adult Self-Report (ASR) [42], which included 44 items on adult internalizing symptoms and 15 items on adult externalizing symptoms. Each time, items for each of these two constructs were summed and dichotomized at the 85th percentile, considered to be a clinically relevant cut-off [45]. Both the CBCL and ASR have previously been validated [46,47].

The number of childhood friends was ascertained in 1991 through parental reports. Parents were asked, "Approximately how many good friends does your child have (excluding brothers and sisters)?" Answers ranged from 0 to 4 or more. The number of friends was

studied categorically (0, 1, 2 to 3 vs. 4 or more friends) and as a dichotomous variable (0 vs. 1 friend).

Covariates included participants' socio-demographic information, childhood learning and psychological difficulties, and parental characteristics. Youth socio-demographic characteristics included age (used as a continuous variable) and sex (male vs. female). Childhood learning difficulties (difficulty with reading, French, math, science, history and geography) were rated by parents in 1991 on an ordinal scale (poor, under average, average, above average) and by the study participants in 2009 (at least 2 repeated grades at school). Participants whose parents rated their academic performance as poor or who repeated two grades at school were classified as having learning difficulties (yes vs. no). Childhood psychological difficulties were treated as a binary variable based on clinically relevant cut-offs (high childhood internalizing symptoms: yes vs. no; high childhood externalizing symptoms: yes vs. no). Parental characteristics included 1) household income, reported by parents in the 1989 GAZEL Cohort study questionnaire and dichotomized at the median value of 1,981 euros per month, which was equivalent the median family income in France at the time [48] (less than median (labelled as "low") vs. greater than median (labelled as "intermediate to high")); 2) divorce/separation, ascertained through parental report between 1989 and 2009 (yes vs. no); history of depression, ascertained through parental yearly self-report on the GAZEL Cohort study questionnaire and participants' reports on the National Institutes of Health-Family Interview for Genetic Studies (NIH FIGS) instrument in the 2009 TEMPO study questionnaire [49] (yes vs. no); and 3) history of heavy alcohol drinking measured through a) parental self-reports of 28 (men) or 21 (women) glasses of alcohol per week in on the GAZEL study questionnaire or b) youth-reported parental alcoholism on the NIH FIGS questionnaire [5](heavy vs. none or moderate alcohol drinking).

Statistical analysis

Our aim was to study childhood friendships in 1991 in relation to participants' internalizing and externalizing symptoms in young adulthood in 2009. First, we computed descriptive statistics for social and demographic covariates as well as internalizing and externalizing symptoms, using chi-square tests for categorical variables and t-tests for continuous variables. Second, we used logistic regression models, adjusted for a) age and sex (based on theoretical grounds), and b) potential covariates associated with our study outcomes reaching a statistical significance level of $p < 0.25$. Additionally, we tested for age and sex interactions. We used the Hosmer-Lemshow chi-square goodness-of-fit test, using a p-value greater than 0.05 as a measure of model fit. For each study outcome, we tested effect modification by age and sex, using the likelihood ratio test. All data were analyzed using Stata 11 [50].

RESULTS

Participant individual and parental characteristics are presented in Table 1. Participant mean age was 29 years and 59% of study participants were female. Five percent of study participants had no friends in childhood and 80% had two or more friends. Sixty-five percent of the study sample came from households with intermediate/high parental income

levels and 30% had a parental history of depression. Respectively, 15% and 13% of the sample had high internalizing and externalizing symptoms.

In bivariate analyses presented in Table 2, compared with participants who had 4 or more friends, participants with no friends had an elevated likelihood of both high internalizing symptoms (OR: 3.85, 95% CI: 1.90–7.85, $p < 0.01$) and high externalizing symptoms (OR: 2.46, 95% CI: 1.18–5.11, $p = 0.02$). The association between childhood friendships and psychological difficulties in young adulthood was comparable regardless of whether participants had 1 or 2–3 or 4 and more friends, therefore we studied childhood friendships as a binary variable (0 vs. 1 friend) in the remaining analyses.

In comparison with participants who had at least one close childhood friend, by young adulthood, those who did not have childhood friends were 2.98 (95% CI: 1.67–5.31, $p < 0.01$) times more likely to have high levels of internalizing symptoms and 2.38 (95% CI: 1.28–4.41, $p = 0.01$) times more likely to have high levels of externalizing symptoms. Additional factors associated with psychological difficulties in young adulthood included childhood internalizing and externalizing symptoms and a parental history of depression.

In multivariate analyses presented in Table 3, controlling for age, sex, childhood internalizing and externalizing symptoms, parental household income, parental history of depression and heavy drinking, participants who had no friends in childhood were two times more likely to experience high internalizing symptoms in young adulthood (adjusted OR: 2.45; 95% CI: 1.32–4.66, $p = 0.01$) than those with at least one childhood friend. Also, the odds of experiencing high externalizing symptoms in young adulthood was increased by 81% for those who had no childhood friends compared to those who had at least one friend, but this fell short of statistical significance after controlling for age, sex, childhood internalizing and externalizing symptoms, and parental history of depression (adjusted OR: 1.81; 95% CI: 0.94–3.54, $p = 0.08$). In additional analyses, we found no statistically significant interactions between childhood social isolation and sex or age, and our study outcomes.

DISCUSSION

In our examination of the association between childhood friendships and later psychological difficulties in a community sample of young adults followed-up over 18 years, we found that individuals with no friends were approximately twice more likely to experience internalizing symptoms compared to those who had at least one childhood friend, even after controlling for socio-demographic factors, childhood psychological difficulties, and parental characteristics. Childhood friendship was also associated with young adult externalizing symptoms, though this observation was not statistically significant. A larger number of friends did not appear to confer an added benefit; rather, having one good friend in childhood was enough to reduce the odds of psychological difficulties in young adulthood.

Our findings regarding internalizing symptoms are consistent with other prospective research on friendship and psychological well-being. In an eight-year follow-up of French Canadian children aged 14 years at study baseline, Pedersen and colleagues found that youth

who did not have friends were most likely to experience depression and loneliness in adolescence [14]. Similarly, in a 13-year follow-up of a community sample of young adults aged 23 years at follow up, Bagwell et al. found that participants who had no friends in childhood were especially likely to experience depression [9].

Prior studies on childhood friendships and externalizing symptoms have reported short-term, but not long-term associations. Laursen and colleagues reported that children who did not have friends in first grade were more likely to experience externalizing symptoms by second grade than those with at least one friend [13]. However, in a community sample of children from Netherlands followed from kindergarten through fourth grade, not having a friend did not predict later externalizing symptoms [8]. Bagwell et al also did not find childhood friendlessness to be positively associated with having problem with the law in young adulthood, after following their participants for 13 years.

Our finding regarding the number of friends and later psychological well-being differs from the results of short-term studies [19,51]. In a school-based study, Waldrip et al. recruited children in fifth through sixth grade students (mean age of 11.7 years) attending both private and public schools in the United States. They measured participants' number of friends at baseline through peer nomination. After seven months of follow-up, they assessed the students' internalizing and externalizing symptoms as reported by teachers or other school personnel, such as the principal. They found that children who had more friends were more likely to be rated as having fewer internalizing symptoms, but not externalizing symptoms [19]. Ladd et al. followed kindergarten students (average age of 5 years) over 6 months. Using similar methods to assess friendship, they showed that having more friends was related to children's overall social adjustment, but not loneliness and depression [51]. A comparison with our study is difficult, as we followed children and adolescents over an extended period. Also, our baseline sample included both children and adolescents, while the other two studies included only children. However, we found no evidence that the relationship between the number of friends and later psychological difficulties varies with age. Finally, our method of measuring friendship through parental report was very different from these two studies, which used peer nomination [19,51].

Our results regarding the number of friends, taken together with Wadrip et al.'s work, suggests that having more friends, compared to fewer friends, may have short-term benefits for mental health, particularly internalizing symptoms, but no long-term effects. This may not be surprising as the variance in psychological difficulties explained by the number of friends early in life is thought to be small [24].

Conceptually, the significance of having at least one friend has been well articulated by Hartup and Steven[11] and Sullivan [52]. Hartup and Stevens, in their review of literature on friendships, describe the element of social reciprocity (or mutuality or the *deep structure of friendship*) with at least friend as a medium through which children and adolescents can develop a sense of security, self-worth, and well-being, which are necessary to successfully cope with immediate and long-term challenges during life transitions [11]. These developments result from the enhanced social skills, support, and identity formation that occur in reciprocated relationships. Sullivan also postulated that interpersonal relationships,

in this case, having a friend, is an essential medium through which individuals explore their identity, develop their strengths, and affirm their self-value [11,52].

The benefits of having a large social network—identity, self-esteem, social support—[21], which are instrumental for good mental health are also present in reciprocated friendships with one friend; thus, from a theoretical perspective, having at least one friend is developmentally significant, a view supported by our data.

Methodologically, our findings also may have implications for conceptualizing friendship quantity as a continuous variable, as we did not find evidence of a linear relationship between friendship quantity and psychological well-being.

Our study has several limitations. First, our sample is predominantly female (59%) and has more favorable socio-economic circumstances than the general population of young adults in France [21]. To the extent that socioeconomic circumstances are associated with social isolation and mental health, the prevalence of social isolation and psychological difficulties in the general population may be higher than we report [53,54]. Second, our measures of young adult internalizing and externalizing symptoms relied on participant self-report and we used a sample-based cut-off point to identify participants with high symptom levels. Our measurement instruments, the Child Behavior Checklist and the Adult-Self Report have been validated against a clinical diagnosis and frequently serve to assess mental health in clinical as well as non-clinical settings [47,55]. Third, we were limited by the fact that we could not assess reciprocity in study participants' friendships. This was one drawback of having a measure of friendship that relied on parental report rather than peer nomination. Peer nomination also has its limitations; however, it mostly focuses on children's friends at for instance school and doesn't account for friends from other settings (e.g. in the neighborhood) [56]. Parents are often more familiar with their children's friends both inside and outside the school. Moreover, parental assessments tend to be consistent with children's reports [57].

Fourth, we were not able to take into account the quality and nature of participants' childhood friendships, which may influence mental health over the short and long-term [17]. For example, we had no information on friends' behavioral problems [58] or characteristics of children's interactions with their friends such as companionship, help and guidance, conflict resolution, and intimate exchange [6]. Future research on life-course determinants of youth mental health would gain in precision by ascertaining characteristics of children's friendships and relations with others.

Some strengths of our study are: 1) we used a community-based sample of young adults who are rarely included in epidemiological studies; 2) our sample was followed up over 18 years, which allowed us to study the association between childhood friendships and psychological difficulties longitudinally; 3) we were able to statistically control for childhood internalizing and externalizing symptoms as well as parental history of depression measured independently of participants' psychological difficulties in young adulthood.

Differences in findings regarding internalizing and externalizing symptoms in our study deserve an explanation. One way to interpret these findings is through Parker and Asher's

“incidental” and “causal” models to understand the role of peer relationships (in this case friendships) and maladjustment. The “incidental model” suggests that the number of friends is a product of individual behavior (such as aggression) or personality (such as shyness); thus, it may offer a minimal contribution to later maladjustment, after adjusting for individual characteristics [59,27]. In our analysis, the association between having a friend in childhood and externalizing symptoms in young adulthood attenuated when we simultaneously corrected for childhood internalizing and externalizing symptoms. It will be important for future studies to account for both types of symptoms in childhood, as co-occurrence of these two symptoms is common [60].

The “causal model” on the other hand argues that an independent relationship between peer relation status and later adult adjustment exists even when we account for childhood difficulties and behaviors. Prior research supports the influence of friendship on internalizing symptoms over the long-term [9,61] and is consistent with our current results. We controlled for preexisting childhood psychological difficulties and parental history of depression, which is a risk factor for youth mental health difficulties [62]; yet, we still found a strong relationship between having friends and internalizing symptoms. One explanation is that childhood friendships and later psychological difficulties have common determinants, such as personality [63]. Our study design does not allow us to account for this possibility; nonetheless, our data indicate that the absence of childhood friendships predicts internalizing symptoms in young adulthood.

There is also a theoretical explanation for not observing a relation between friendships and externalizing symptoms over the long-term. Friendship is based on individual similarities (such as socio-economic background or behavioral characteristics) [17]. Children and adolescents who have externalizing behaviors have trouble making and keeping friends [10], but when they do make friends, these friendships are often with others of similar characteristics [64]. Such peer affiliations with other children with externalizing behaviors can increase anti-social problems and externalizing symptoms through the mechanism of deviancy training [30].

Deviancy training occurs when friends of similar anti-social backgrounds engage in discourse about and rehearsal of deviant activities [30]. Snyder et al. have suggested that such interactional processes serves as cognitive models and verbal instructions for promoting anti-social behaviors in other social settings [32]. Another aspect of deviancy training is that deviant peers educate each other on how to avoid adult surveillance [32]. Consequently, adult correction of such problems can be difficult, particularly among adolescents who spend significant time with peers receiving limited adult monitoring [32].

Several studies have shown that deviancy training through friendships of children and adolescents with conduct problems is one of the key mechanisms that enables development of behavioral problems, like externalizing problems, over time [31–34]. For example, in a school sample of kindergarteners, Snyder et al. video recorded children’s conversations and play in a laboratory setting. They found that friends whose play and discussions centered on norm-violating topics (including aggression and authority defiance) were more likely to self-report externalizing symptoms four years later[32]. In an earlier study, Dishion et al. also

reported that adolescent dyads aged 13–14 years who participated in similar discourse and received affirmation from each other were more likely to be involved in serious delinquency and use alcohol two years later [30]. The existing literature thus supports the contention that friendships may not be protective against externalizing problems when friends share similar problematic behavioral backgrounds [35]. This could also explain why we did not find an association between childhood friendships and externalizing symptoms in young adulthood.

Several psychological and social mechanisms could contribute to the association we found between childhood friendships and later internalizing symptoms. As advanced by Oland and Shaw, failure to form close friendships may negatively affect self-esteem and play a role in the onset of psychological difficulties [65], which can persist[2]. It is speculated that this may be due to children's failure to develop social, emotional and cognitive competences, a pattern that continues as people interact with their environments throughout life [66]. As a result, difficulties in forming friendships early in life may inhibit the formation of close and supportive relationships in later years [67], possibly contributing to psychological difficulties throughout life.

Socially, friendships provide a sense of security, safety and support against environmental stressors, through empathetic and compassionate behaviors, as well as the sharing of information and material resources[11]. Social support may buffer the negative consequences of external stressors such as school adjustments, bullying, peer exclusion or family problems, thereby contributing to individual differences in physical and psychological responses to stressors, which are a source of poor mental health [68,69]. For example, Hodges et al. demonstrated that friendships mitigate the long-term consequences of peer victimization [70]. Similarly, in a longitudinal study over a three-year period, Bukowski et al. found that children who had friends were less likely to have depressive affect even in the case of peer exclusion and withdrawal symptoms [61].

Factors that contribute to children's formation of close friendships are varied. At the individual level, particular child personality traits (such as shyness, fearfulness and anxiety) and behavior problems (such as delinquency) are known to have a negative influence on children's sociability [71,72]. Yet in the present study, the association between friendship and later internalizing symptoms remained statistically significant after we controlled for prior psychological difficulties. The social environment, particularly family cohesion [73], classroom dynamics [74] and peer rejection [9] can also contribute to the formation of close friendships early on in life.

Moreover, other aspects of youth social relations, which we did not measure – including the quality of relations with parents and siblings– can also be associated with youth mental health [75]. In a review of research on the family social environment and children's mental health, Rapetti et al. found that in a context of family conflict, children are not able to learn how to control and express their emotions and social competencies, which can affect their ability to develop friendships and experience positive mental health[75]. Future research would gain from systematically studying associations between different types of close social relations early in life and later mental health, accounting for positive as well as negative aspects of sociability.

Overall, our study suggests that having at least one friend early in life is protective of internalizing symptoms in young adulthood, which is a crucial time when individuals establish their family and professional lives. Therefore, children who do not have friends may require special attention, whether they experience concurrent psychological difficulties or not. Additionally, family and school characteristics that help children foster friendships from early in life should be supported.

Acknowledgements

The authors wish to thank the GAZEL cohort study team for help in implementing the TEMPO study. This research was supported by the French Ministry of Health–IReSP (TGIR Cohortes, 2010 Research Call), the French Interdepartmental Mission for the Fight Against Drugs and Drug Addiction (MILDT), the French Institute of Cancer (INCa), and the French Foundation for Research on Psychiatry and Mental Health (FRPSM). Kwame Sakyi is supported by National Institute of Health's training grant—T32DA13911. Maria Melchior is the recipient of a Young Researcher Award from the French National Research Agency (ANR).

REFERENCES

1. Bardone AM, Moffitt TE, Caspi A, Dickson N, Stanton WR, Silva PA. Adult physical health outcomes of adolescent girls with conduct disorder, depression, and anxiety. *J Am Acad Child Adolesc Psychiatry*. 1998; 37(6):594–601. [PubMed: 9628079]
2. Bongers IL, Koot HM, van der Ende J, Verhulst FC. The normative development of child and adolescent problem behavior. *J Abnorm Psychol*. 2003; 112(2):179–192. [PubMed: 12784827]
3. Costello EJ, Mustillo S, Erkanli A, Keeler G, Angold A. Prevalence and development of psychiatric disorders in childhood and adolescence. *Arch Gen Psychiatry*. 2003; 60(8):837–844. [PubMed: 12912767]
4. Kerr DCR, Reinke WM, Eddy JM. Trajectories of depressive symptoms and externalizing behaviors across adolescence: Associations with histories of suicide attempt and ideation in early adulthood. *Suicide Life Threat Behav*. 2013; 43(1):50–66. [PubMed: 23062170]
5. Laird RD, Jordan KY, Dodge KA, Pettit GS, Bates JE. Peer rejection in childhood, involvement with antisocial peers in early adolescence, and the development of externalizing behavior problems. *Dev Psychopathol*. 2001; 13(2):337–354. [PubMed: 11393650]
6. Gaertner AE, Fite PJ, Colder CR. Parenting and friendship quality as predictors of internalizing and externalizing symptoms in early adolescence. *J Child Fam Stud*. 2010; 19(1):101–108.
7. Nangle DW, Erdley CA, Newman JE, Mason CA, Carpenter EM. Popularity, friendship quantity, and friendship quality: Interactive influences on children's loneliness and depression. *J Clin Child Adolesc Psychol*. 2003; 32(4):546–555. [PubMed: 14710463]
8. Van Lier PAC, Koot HM. Developmental cascades of peer relations and symptoms of externalizing and internalizing problems from kindergarten to fourth-grade elementary school. *Dev Psychopathol*. 2010; 22(3):569–582. [PubMed: 20576179]
9. Bagwell CL, Newcomb AF, Bukowski WM. Preadolescent friendship and peer rejection as predictors of adult adjustment. *Child Dev*. 1998; 69(1):140–153. [PubMed: 9499563]
10. Hartup WW. Social relationships and their developmental significance. *Am Psychol*. 1989; 44(2): 120–126.
11. Hartup WW, Stevens N. Friendships and adaptation across the life span. *Curr Dir Psychol Sci*. 1999; 8(3):76–79.
12. Ladd GW, Troop-Gordon W. The role of chronic peer difficulties in the development of children's psychological adjustment problems. *Child Dev*. 2003; 74(5):1344–1367. [PubMed: 14552402]
13. Laursen B, Bukowski WM, Aunola K, Nurmi J-E. Friendship moderates prospective associations between social isolation and adjustment problems in young children. *Child Dev*. 2007; 78(4): 1395–1404. [PubMed: 17650145]

14. Pedersen S, Vitaro F, Barker ED, Borge AIH. The timing of middle-childhood peer rejection and friendship: Linking early behavior to early-adolescent adjustment. *Child Dev.* 2007; 78(4):1037–1051. [PubMed: 17650124]
15. Zettergren, P. Girls' best friendship in school as predictor of adjustment in adulthood: a follow-up from preadolescence to middle adulthood. In: Toller, JC., editor. *Friendships: Types, cultural, psychological and social aspects.* New York: Nova Science Publishers, Inc; 2010. p. 163-195.
16. Modin B, Ostberg V, Almquist Y. Childhood peer status and adult susceptibility to anxiety and depression. A 30-year hospital follow-up. *J Abnorm Child Psychol.* 2011; 39(2):187–199. [PubMed: 20886279]
17. Bukowski, WM.; Hoza, B. Popularity and friendship: Issues in theory, measurement, and outcome . In: Berndt, TJ.; Ladd, GW., editors. *Peer relationships in child development.* New York: Wiley; 1989. p. 15-45.
18. Bagwell CL, Bender SE, Andreassi CL, Kinoshita TL, Montarello SA, Muller JG. Friendship quality and perceived relationship changes predict psychosocial adjustment in early adulthood. *J Soc Pers Relat.* 2005; 22(2):235–254.
19. Waldrip AM, Malcolm KT, Jensen-Campbell LA. With a little help from your friends: The importance of high-quality friendships on early adolescent adjustment. *Soc Dev.* 2008; 17(4):832–852.
20. Ladd GW, Kochenderfer BJ, Coleman CC. Friendship quality as a predictor of young children's early school adjustment. *Child Dev.* 1996; 67(3):1103–1118. [PubMed: 8706512]
21. Berkman LF, Glass T, Brissette I, Seeman TE. From social integration to health: Durkheim in the new millennium. *Soc Sci Med.* 2000; 51(6):843–857. [PubMed: 10972429]
22. Kahn, RL.; Antonucci, T. Convoys over the life course: Attachment, roles, and social support. In: Baltes, PB.; Brim, OB., editors. *Life-span development and behavior.* Vol. 3. New York: Academic Press; 1980.
23. Levitt MJ, Guaccifranco N, Levitt JL. Convoys of social support in childhood and early adolescence - Structure and function. *Dev Psychol.* 1993; 29(5):811–818.
24. Gest SD, Graham-Bermann SA, Hartup WW. Peer experience: Common and unique features of number of friendships, social network centrality, and sociometric status. *Soc Dev.* 2001; 10(1):23–40.
25. Almquist YM. Childhood friendships and adult health: findings from the Aberdeen children of the 1950s cohort study. *Eur J Public Health.* 2012; 22(3):378–383. [PubMed: 21498559]
26. Ostberg V, Modin B. Status relations in school and their relevance for health in a life course perspective: Findings from the Aberdeen children of the 1950's cohort study. *Soc Sci Med.* 2008; 66(4):835–848. [PubMed: 18158207]
27. Prinstein MJ, La Greca AM. Childhood peer rejection and aggression as predictors of adolescent girls' externalizing and health risk behaviors: A 6-year longitudinal study. *J Consult Clin Psychol.* 2004; 72(1):103–112. [PubMed: 14756619]
28. Dodge KA, Somberg DR. Hostile attributional biases among aggressive boys are exacerbated under conditions of threats to the self. *Child Dev.* 1987; 58(1):213–224. [PubMed: 3816345]
29. Parker JG, Asher SR. Friendship and friendship quality in middle childhood - Links with peer group acceptance and feelings of loneliness and social dissatisfaction. *Dev Psychol.* 1993; 29(4): 611–621.
30. Dishion TJ, Spracklen KM, Andrews DW, Patterson GR. Deviancy training in male adolescent friendships. *Behav Ther.* 1996; 27(3):373–390.
31. Dishion TJ, Eddy JM, Haas E, Li FZ, Spracklen K. Friendships and violent behavior during adolescence. *Soc Dev.* 1997; 6(2):207–223.
32. Snyder J, McEachern A, Schrepferman L, Just C, Jenkins M, Roberts S, Lofgreen A. Contribution of peer deviancy training to the early development of conduct problems: Mediators and moderators. *Behav Ther.* 2010; 41(3):317–328. doi:<http://dx.doi.org/10.1016/j.beth.2009.05.001>. [PubMed: 20569781]
33. Snyder J, Schrepferman L, Oeser J, Patterson G, Stoolmiller M, Johnson K, Snyder A. Deviancy training and association with deviant peers in young children: Occurrence and contribution to early-onset conduct problems. *Dev Psychopathol.* 2005; 17(2):397–413. [PubMed: 16761551]

34. Snyder J, Schrepferman L, McEachern A, Barner S, Johnson K, Provines J. Peer deviancy training and peer coercion: Dual processes associated with early-onset conduct problems. *Child Dev.* 2008; 79(2):252–268. [PubMed: 18366422]
35. Hartup WW. The company they keep: Friendships and their developmental significance. *Child Dev.* 1996; 67(1):1–13. [PubMed: 8605821]
36. La Greca AM, Lopez N. Social anxiety among adolescents: linkages with peer relations and friendships. *J Abnorm Child Psychol.* 1998; 26(2):83–94. [PubMed: 9634131]
37. Adams RE, Bukowski WM, Bagwell C. Stability of aggression during early adolescence as moderated by reciprocated friendship status and friend's aggression. *Int J Behav Dev.* 2005; 29(2): 139–145.
38. Haynie D. Friendship networks and delinquency: The relative nature of peer delinquency. *J Quant Criminol.* 2002; 18(2):99–134.
39. Goldberg M, Leclerc A, Bonenfant S, Chastang JF, Schmaus A, Kaniewski N, Zins M. Cohort profile: the Gazel study cohort. *Int J Epidemiol.* 2007; 36(1):32–39. [PubMed: 17101614]
40. Redonnet B, Chollet A, Fombonne E, Bowes L, Melchior M. Tobacco, alcohol, cannabis and other illegal drug use among young adults: the socioeconomic context. *Drug Alcohol Depend.* 2012; 121(3):231–239. [PubMed: 21955362]
41. Fombonne E. The use of questionnaires in child psychiatry research: measuring their performance and choosing an optimal cut-off. *J Child Psychol Psychiatry.* 1991; 32(4):677–693. [PubMed: 1864896]
42. Achenbach, TM. A manual for the youth self-report in 1991 profile. Burlington, VT: University of Vermont Department of Psychiatry; 1991.
43. Alonso J, Angermeyer MC, Bernert S, Bruffaerts R, Brugha TS, Bryson H, de Girolamo G, Graaf R, Demyttenaere K, Gasquet I. Sampling and methods of the European Study of the Epidemiology of Mental Disorders (ESEMeD) project. *Acta Psychiatr Scand Suppl.* 2004; 420:8–20. [PubMed: 15128383]
44. Achenbach, TM. [Accessed Jan 11 2007] Achenbach System of Empirically-Based Assessment. 2007. <http://www.aseba.org/>.
45. Amone-P'Olak K, Burger H, Ormel J, Huisman M, Verhulst FC, Oldehinkel AJ. Socioeconomic position and mental health problems in pre- and early-adolescents: the TRAILS study. *Soc Psychiatry Psychiatr Epidemiol.* 2009; 44(3):231–238. [PubMed: 18714424]
46. Reef J, Diamantopoulou S, van Meurs I, Verhulst F, van der Ende J. Predicting adult emotional and behavioral problems from externalizing problem trajectories in a 24-year longitudinal study. *Eur Child Adolesc Psychiatry.* 2010; 19(7):577–585. [PubMed: 20140633]
47. Bilenberg N. The Child Behavior Checklist (CBCL) and related material: standardization and validation in Danish population based and clinically based samples. *Acta Psychiatr Scand Suppl.* 1999; 398:2–52. [PubMed: 10687023]
48. INSEE. [Accessed April 11 2011] Taux de chômage par tranche d'âge. Institut National de la Statistique et des Études Économiques. 2009. http://www.insee.fr/fr/ffc/chifcle_fiche.asp?ref_id=NATCCF03302&tab_id=313&souspop=1.
49. Maxwell, E. The family interview for genetic studies. Clinical Neurogenetics Branch, Intramural Research Program National Institute of Mental Health; 1992.
50. StatCorp. Stata Statistical Software: Release 11. College Station, Texas: StataCorp LP; 2009.
51. Ladd GW, Kochenderfer BJ, Coleman CC. Classroom peer acceptance, friendship, and victimization: Distinct relational systems that contribute uniquely to children's school adjustment? *Child Dev.* 1997; 68(6):1181–1197. [PubMed: 9418233]
52. Sullivan, H. The Interpersonal Theory of Psychiatry. Norton, New York: 1953.
53. Vandervoort D. Social isolation and gender. *Curr Psychol.* 2000; 19(3):229–236.
54. Lorant V, Deliege D, Eaton W, Robert A, Philippot P, Ansseau M. Socioeconomic inequalities in depression: A meta-analysis. *Am J Epidemiol.* 2003; 157(2):98–112. [PubMed: 12522017]
55. Wiznitzer M, Verhulst FC, van den Brink W, Koeter M, van der Ende J, Giel R, Koot HM. Detecting psychopathology in young adults: the Young Adult Self Report, the General Health Questionnaire and the Symptom Checklist as screening instruments. *Acta Psychiatr Scand.* 1992; 86(1):32–37. [PubMed: 1414396]

56. Kiesner J, Kerr M, Stattin H. "Very Important Persons" in adolescence: going beyond in-school, single friendships in the study of peer homophily. *J Adolesc.* 2004; 27(5):545–560. [PubMed: 15475046]
57. Frankel, F.; Cantwell, DP.; Myatt, R. Helping ostracized children: Social skills training and parent support for socially rejected children. In: Hibbs, ED.; Jensen, PS., editors. *Psychosocial treatments for child and adolescent disorders: Empirically based strategies for clinical practice.* Vol. xxi. Washington, DC, US: American Psychological Association; 1996. p. 595-617.
58. Kupersmidt JB, Burchinal M, Patterson CJ. Developmental patterns of childhood peer relations as predictors of externalizing behavior problems. *Dev Psychopathol.* 1995; 7(4):825–843.
59. Parker JG, Asher SR. Peer relations and later personal adjustment - Are low-accepted children at risk. *Psychol Bull.* 1987; 102(3):357–389. [PubMed: 3317467]
60. Capaldi DM. Cooccurrence of conduct problems and depressive symptoms in early adolescent boys: II. A 2-year follow-up at grade-8. *Dev Psychopathol.* 1992; 4(1):125–144.
61. Bukowski WM, Laursen B, Hoza B. The snowball effect: Friendship moderates escalations in depressed affect among avoidant and excluded children. *Dev Psychopathol.* 2010; 22(4):749–757. doi:<http://dx.doi.org.proxy3.library.jhu.edu/10.1017/S095457941000043X>. [PubMed: 20883579]
62. Pilowsky DJ, Wickramaratne P, Nomura Y, Weissman M. Family discord, parental depression, and psychopathology in offspring: 20-year follow-up. *J Am Acad Child Adolesc Psychiatry.* 2006; 45(4):452–460. doi:<http://dx.doi.org/10.1097/01.chi.0000198592.23078.8d>. [PubMed: 16601650]
63. Wichers M, Maes HH, Jacobs N, Derom C, Thiery E, Kendler KS. Disentangling the causal inter-relationship between negative life events and depressive symptoms in women: a longitudinal twin study. *Psychol Med.* 2012; 42(9):1801–1814. [PubMed: 22273464]
64. Poulin F, Cillessen AHN, Hubbard JA, Coie JD, Dodge KA, Schwartz D. Children's friends and behavioral similarity in two social contexts. *Soc Dev.* 1997; 6(2):224–236.
65. Oland AA, Shaw DS. Pure versus co-occurring externalizing and internalizing symptoms in children: The potential role of socio-developmental milestones. *Clin Child Fam Psychol Rev.* 2005; 8(4):247–270. [PubMed: 16362255]
66. Scarr S, McCartney K. How people make their own environments - a theory of genotype-environment effects. *Child Dev.* 1983; 54(2):424–435. [PubMed: 6683622]
67. Nezlek JB, Imbrie M, Shean GD. Depression and everyday social-interaction. *J Pers Soc Psychol.* 1994; 67(6):1101–1111. [PubMed: 7815303]
68. Ladd GW, Kochenderfer BJ, Coleman CC. Classroom peer acceptance, friendship, and victimization: Distinct relation systems that contribute uniquely to children's school adjustment? *Child Dev.* 1997; 68(6):1181–1197. [PubMed: 9418233]
69. Sias, P.; Bartoo, H. Friendship, social support and health. In: L' Abate, L., editor. *Low-cost approaches to promote physical and mental health.* New York: Springer; 2007. p. 455-472.
70. Hodges EV, Boivin M, Vitaro F, Bukowski WM. The power of friendship: protection against an escalating cycle of peer victimization. *Dev Psychol.* 1999; 35(1):94–101. [PubMed: 9923467]
71. Rubin, KH.; Burgess, KB.; Coplan, RJ. Social withdrawal and shyness. In: Smith, PK.; Hart, C., editors. *Blackwell Handbook of Childhood Soc Dev.* 2nd edn. Malden, MA: Wiley-Blackwell; 2010. p. 434-452.
72. Rubin, KH.; Bukowski, WM.; Parker, JG. Peer interactions, relationships, and groups. In: Damon, W.; Eisenberg, N., editors. *Handbook of Child Psychology.* Vol. 3. New York: John Wiley & Sons, Inc; 1998. p. 619-700.
73. Gauze C, Bukowski WM, Aquan-Assee J, Sippola LK. Interactions between family environment and friendship and associations with self-perceived well-being during early adolescence. *Child Dev.* 1996; 67(5):2201–2216. [PubMed: 9022238]
74. Hallinan MT, Tuma NB. Classroom effects on change in children's friendships. *Sociol Educ.* 1978; 51:270–282.
75. Repetti RL, Taylor SE, Seeman TE. Risky families: family social environments and the mental and physical health of offspring. *Psychol Bull.* 2002; 128(2):330–366. [PubMed: 11931522]

Table 1 Individual and family characteristics and internalizing and externalizing symptoms among TEMPO study participants (1991–2009)

Descriptive Characteristics	N (%)	Mean (+/-SD) (N=1103)	Adult Internalizing Symptoms (N=1067)	p-value	Adult Externalizing Symptoms (N=1090)	p-value
Age in 2009 (years)	1103	28.94 (+/-3.68)		0.88		0.77
Sex						
Female	649 (59)		95 (15)	0.80	87 (14)	0.69
Male	454 (41)		64 (14)		57 (13)	
Number of childhood friends						
Zero	59 (5)		19 (33)	<0.01	15 (25)	0.04
1	161 (15)		21 (14)		22 (14)	
2 or 3	678 (62)		98 (15)		84 (13)	
4 or more	194 (18)		21 (11)		23 (12)	
Childhood learning difficulties						
Yes	328(19)		21 (14)	0.83	119 (13)	0.60
No	775(81)		132 (15)		22 (15)	
Childhood internalizing symptoms						
Yes	162 (15)		34 (21)	0.02	31 (19)	0.01
No	910 (85)		123 (14)		110 (12)	
Childhood externalizing symptoms						
Yes	129 (12)		24 (19)	0.17	27 (21)	0.01
No	964 (88)		135 (14)		117 (12)	
Household income						
Low	373 (35)		47 (13)	0.17	45 (12)	0.47
High/intermediate	698 (65)		109 (16)		96 (14)	
Parental divorce/separation						
Yes	154 (15)		21 (14)	0.82	21 (14)	0.98
No	889 (85)		126 (15)		117 (13)	
Parental history of depression						
Yes, at least twice	324 (30)		65 (21)	<0.01	60 (19)	<0.01

Descriptive Characteristics	N (%)	Mean (+/-SD) (N=1103)	Adult Internalizing Symptoms (N=1067)	p-value	Adult Externalizing Symptoms (N=1090)	p-value
Never or once	749 (70)		92 (12)		83 (11)	
Parental heavy alcohol drinking						
Yes	253 (23)		29 (12)	0.10	37 (15)	0.44
No	846 (77)		129 (16)		107 (13)	
Young adult internalizing symptoms						
Yes	159 (15)		--	--	80 (50)	<0.01
No	908 (85)		--		57 (6)	
Young adult externalizing symptoms						
Yes	144 (13)		80 (58)	<0.01	--	--
No	960 (87)		79 (9)		--	

Table 2

Number of childhood friends and internalizing and externalizing symptoms in young adulthood: bivariate regression analyses (TEMPO study, 22–35 years in 2009)

Descriptive Characteristics	Young Adult Internalizing Symptoms (N=1067) OR (95%CI)	p-value	Young Adult Externalizing Symptoms (N=1090) OR (95%CI)	p-value
Age (years)	1.00 (0.95–1.05)	0.88	1.01 (0.96–1.05)	0.77
Sex				
Female	0.96 (0.68–1.35)	0.80	0.93 (0.65–1.33)	0.69
Male	1.00		1.00	
Number of childhood friends				
Zero	3.85 (1.90–7.85)	<0.01	2.46 (1.18–5.11)	0.02
1	1.24 (0.65–2.38)	0.50	1.15 (0.61–2.15)	0.66
2 or 3	1.38 (0.84–2.29)	0.21	1.03 (0.63–1.69)	0.90
4 or more	1.00		1.00	
Number of childhood friends				
Zero	2.99 (1.68–5.32)	<0.01	2.36 (1.28–4.36)	0.01
1 or more	1.00		1.00	
Childhood learning difficulties				
Yes	0.98 (.68–1.42)	0.94	1.13 (0.77–1.65)	0.53
No	1.00		1.00	
Childhood internalizing symptoms				
Yes	1.67 (1.09–2.55)	0.02	1.72 (1.11–2.67)	0.02
No	1.00		1.00	
Childhood externalizing symptoms				
Yes	1.40 (0.87–2.27)	0.17	1.93 (1.21– 3.08)	0.01
No	1.00		1.00	
Household income				
Low	0.77 (0.53–1.12)	0.17	0.87 (0.60–1.27)	0.47
High/intermediate	1.00		1.00	
Parental divorce/separation				
Yes	0.94 (0.58–1.57)	0.82	1.03 (0.63–1.71)	0.98
No	1.00		1.00	
Parental history of depression				
Yes, at least twice	1.86 (1.31–2.64)	<0.01	1.88 (1.31–2.70)	0.01
Never or once	1.00		1.00	
Parental heavy alcohol drinking				
Yes	0.70 (0.45–1.07)	0.10	1.17 (0.78–1.75)	0.44
No	1.00		1.00	

Abbreviations: CI, Confidence interval; OR, Odds Ratio

Table 3

Number of childhood friends and internalizing and externalizing symptoms in young adulthood: Multivariate regression analyses (TEMPO study, 22–35 years in 2009)

Descriptive Characteristic	Young Adult Internalizing symptoms (N=995) ^a Adjusted OR (95%CI)	p-value	Young Adult Externalizing symptoms (N=1046) ^b Adjusted OR (95%CI)	p-value
<i>Model adjusted for age and sex</i>				
Number of childhood friends				
Zero	2.98 (1.67- 5.31)	<0.01	2.38 (1.28- 4.41)	0.01
1 or more	1.00		1.00	
<i>Full Model</i>				
Number of childhood friends				
Zero	2.45 (1.32–4.66)	0.01	1.81 (0.94–3.54)	0.08
1 or more	1.00		1.00	

Abbreviations: CI, Confidence interval; OR, Odds Ratio.

^aThe full model studying young adult internalizing symptoms is controlled for age, sex, childhood internalizing symptoms, childhood externalizing symptoms, parental household income, parental history of depression and parental heavy drinking. Hosmer-Lemeshow goodness of fit test for full model; p=0.49

^bThe full model studying young adult externalizing symptoms is controlled for age, sex, childhood internalizing symptoms, childhood externalizing symptoms and parental history of depression. Hosmer-Lemeshow goodness of fit test for full model p-value=0.81