

The association of social support in families with a parent having bipolar disorder and substance use among offspring: A 10-year longitudinal study

Florencia Trespalacios

A Thesis
In the Department of
Psychology

Presented in Partial Fulfillment of the Requirements
For the Degree of
Master of Arts (Psychology, Research and Clinical Training Option) at
Concordia University
Montreal, Quebec, Canada

March 2022

© Florencia Trespalacios, 2022

CONCORDIA UNIVERSITY

School of Graduate Studies

This is to certify that the thesis prepared

By: Florencia Trespalacios

Entitled: The association of social support in families with a parent having bipolar disorder and substance use among offspring: A 10-year longitudinal study

and submitted in partial fulfillment of the requirements for the degree of

Master of Arts (Psychology, Research and Clinical Training Option)

complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Signed by the final examining committee:

Kristen Dunfield Chair

Lisa Serbin Examiner

Roisin O'Connor Examiner

Mark Ellenbogen Thesis Supervisor(s)

Approved by _____
Kristen Dunfield, Chair of the Department or Graduate Program Director

2022

Effrosyni Diamantoudi, Dean

Abstract

The association of social support in families with a parent having bipolar disorder and substance use among offspring: A 10-year longitudinal study

Florencia Trespalacios

The offspring of parents with bipolar disorder (OBD) are at higher risk for the development of mental disorders than the offspring of parents with no affective disorder (ONAD). In addition to genetic factors, childhood adversity and a stressful family environment are important risk factors for the OBD. Protective factors in parents, such as social support, may buffer the effects of stress on at-risk children. The present study tested whether parents' social support and coping style attenuated the relationship between risk status (OBD vs ONAD) and symptoms of mental disorders in offspring. At time 1, when offspring were in middle childhood, parents underwent a diagnostic interview and completed measures of social support and coping style. Sixty nine OBD and 69 ONAD (68 female) between 13 and 29 years old completed a diagnostic interview approximately 10 years later (time 2). As predicted, parents' social support satisfaction was associated with less substance use disorders (SUDs) symptoms in OBD, but not ONAD (Risk Status X Social Support Satisfaction; $F(1, 132)=5.54, p=.02$). Unexpectedly, the OBD whose parents reported a larger social network developed more anxiety and depression symptoms than ONAD (Risk Status X Network Size; $F(1, 132)=6.24, p=.014$). No effects of parents' coping style were found. Among OBD, having parents with greater social support satisfaction and a smaller social network buffered their development of SUDs and depression and anxiety symptoms by early adulthood. Social support in these high-risk families might have an important protective function for their children's development.

Acknowledgements

I would like to thank my research supervisor, Mark Ellenbogen, for his guidance, support and trust throughout the completion of this degree. His help and feedback over the years have been invaluable in helping me become a better researcher and scientific writer. I am grateful and proud to have been able to conduct my research in the Ellenbogen laboratory and to continue working with this team into my doctoral studies. I would like to thank Sheilagh Hodgins for collaborating with the Ellenbogen laboratory on this project. Thank you to my committee members, Lisa Serbin and Roisin O'Connor, for their feedback on my thesis. Thank you to the graduate students and volunteers of the Ellenbogen laboratory for their work on this research project, and for making the laboratory such a great place to work at. I would particularly like to thank Lisa Serravalle for her guidance and wisdom as I navigated graduate school and my research projects. I would also like to thank my parents, siblings and my friends for their constant support and encouragement and for keeping me grounded throughout this whole process. A special thanks goes to my friend and peer, Sara M., for her friendship and support in the graduate program. The completion of my master's degree has been supported by an award from Concordia's Faculty of Arts and Science, of which I am very grateful.

Contribution of Authors

Mark Ellenbogen and Sheilagh Hodgins designed the study. Research assistants collected the data. Florencia Trespalacios conducted the statistical analyses and wrote the first draft of the manuscript. Mark Ellenbogen revised the manuscript, as did Sheilagh Hodgins, Ariel Boyle and Lisa Serravalle. All authors contributed to and approved of the final manuscript.

Table of Contents

Introduction	1
Method	2
<i>Participants</i>	2
<i>Measures</i>	3
<i>Procedure</i>	4
<i>Statistical analyses</i>	4
Results	5
<i>Comparison of OBD and ONAD</i>	5
<i>The effect of parents' social support satisfaction at time 1 on the relationship between offspring risk status and psychopathology symptoms at time 2</i>	5
<i>The effect of parents' social network size at time 1 on the relationship between offspring risk status and psychopathology symptoms at time 2</i>	6
<i>The effect of parents' use of task-oriented coping at time 1 on the relationship between offspring risk status and psychopathology symptoms at time 2</i>	6
Discussion	6
References	10
Tables and Figures	15
Supplementary Materials	20

The association of social support in families with a parent having bipolar disorder and substance use among offspring: A 10-year longitudinal study

Introduction

Bipolar Disorder (BD) is a chronic mental disorder that impairs cognitive and psychosocial functioning, and negatively affects quality of life (Grande et al., 2016). BD poses an important societal burden, including the high costs of disability, treatment, and comorbid mental and physical conditions (Conus et al., 2014). Moreover, BD in a parent is associated with impaired family functioning that in turn is associated with difficulties among their children (Ellenbogen & Hodgins, 2004; Serravalle et al., 2020). A number of studies report that offspring of parents with BD (OBD), relative to offspring of parents with no affective disorder (ONAD), are at elevated risk to have internalizing and externalizing problems, and to develop affective disorders, other mental disorders in general and substance misuse (Duffy et al., 2014; Iacono et al., 2018; Nijjar et al., 2014; Rasic et al., 2014). One major vulnerability factor for OBD is the high genetic heritability of BD, which is estimated at approximately 85% (McGuffin et al., 2003). However, the mental and behavioral problems that OBD are at higher risk of developing are still best conveyed through complex interactions between genetic and environmental factors (Brietzke et al., 2012).

Previous studies have identified environmental risk factors including suboptimal parenting practices, poor communication strategies among parents, family conflict, and instability and a lack of structure in the home (Calam et al., 2012; Chang et al., 2001; Ellenbogen et al., 2004; Ostiguy et al., 2012; Vance et al., 2008). In turn, stressful home environments are associated with an elevated risk of emotional, behavioral, and interpersonal difficulties among the OBD (Bella et al., 2011; Iacono et al., 2018; Nijjar et al., 2014; Whitney et al., 2013). Indeed, anxiety and sleep problems in childhood appear to be an early marker of risk among the OBD, that precede the emergence of subthreshold affective symptoms and substance use problems in adolescence, followed by the onset of an affective disorder (Duffy et al., 2014, 2019). Research has focused mainly on risk factors and developmental trajectories of OBD, rarely identifying protective factors that have the potential to improve current functioning and longer-term outcomes.

Social support is a well-established contributor to greater overall well-being, buffering against psychological distress, depression and anxiety, and even reducing the risk of mortality (Cohen, 2004; Gariépy et al., 2016; Espinosa & Rudenstine, 2020; Holt-Lunstad et al., 2010). Relative to parents without a mental disorder, parents with BD and their intimate partners report smaller social networks, less social contact, and lower satisfaction with their own social support (Serravalle et al., 2020). Low perceived social support in individuals with BD has been linked with lower medication compliance, increased stress, and more depressive episodes over the course of a year (Boyers & Rowe, 2018; Cohen et al., 2004), potentially exposing their offspring to more stressful and unpredictable family environments. Longitudinal investigations have shown that poor social support among parents is a risk factor that promotes the development of psychopathology in their offspring (Ashman et al., 2008; Barker et al., 2012). By contrast, studies find that higher levels of social support reported by parents is linked to more optimal parenting practices and better psychological adjustment in offspring (Hughes et al., 2020; Nunes et al., 2021; Waylen & Stewart-Brown, 2010). Taken together, it is thus plausible that having parents with high perceived social support is a protective factor that may buffer the OBD's higher predisposition psychological difficulties.

A 10-YEAR LONGITUDINAL STUDY

In addition to social support, a person's ability to adaptively cope with stressors is another factor that promotes physical and psychological well-being (Marroquín et al., 2017; Skinner & Zimmer-Gembeck, 2015, 2016). Endler and Parker (1994) identified three dimensions of coping in response to stressors: task-oriented (i.e. attempt to problem-solve situation), emotion-focused (i.e. attempt to self-regulate the emotional response), and avoidant-oriented (i.e. attempt to distract oneself). Emotion-focused and avoidant-oriented coping are generally associated with greater symptoms of psychopathology, whereas task-oriented coping is linked to lower psychological distress (Endler et al., 1994; Higgins & Endler, 1995; Skinner et al., 2016). Individuals with BD, as well as their intimate partners, are more reliant on maladaptive coping strategies such as emotion-oriented coping compared to persons with no mental disorder (Fletcher et al., 2013; Moon et al., 2014; Serravalle et al., 2020). Among parents with BD, those who are reliant on emotion-focused coping foster a stressful family environment that can negatively influence their offspring's psychosocial functioning, as compared to those who engage in more task-oriented coping, which is more adaptive (Borowiecka-Karpiuk et al., 2014; Ellenbogen et al., 2004). Moreover, the effect that parents' coping strategies may have on OBD could be further exacerbated by their likelihood of adopting or modeling the their parents' strategies (Jones et al., 2006; Liga et al., 2020; Nijjar et al., 2014). Thus, parents' use of effective coping strategies may also represent an important protective factor against the development of psychopathology in the OBD.

To date, there are no longitudinal studies assessing whether parents' social support and effective coping serve as a protective factor for OBD. The present study focuses on parents with BD and their offspring and aimed to determine whether higher levels of social support and use of task-oriented coping by parents when their offspring were in middle childhood were associated with lower levels of mental health problems among their offspring ten years later. We hypothesized that parents' social support when their children were in middle childhood would moderate the relationship between risk status (OBD vs ONAD) and the offspring's development of psychopathology symptoms. That is, parents' higher levels of social support (i.e., number of contacts and satisfaction with support received) was expected to attenuate the development of symptoms of depression, anxiety, and substance use disorders (SUDs) among the OBD, but not the ONAD. We also hypothesized that parents' coping style would moderate the relationship between risk status and the development of psychopathology symptoms in their offspring. We predicted that having parents who used more task-oriented coping would attenuate the development of symptoms of depression, anxiety and SUDs among the OBD, but not the ONAD.

Method

Participants

A total of 105 families were recruited into a longitudinal study in which data collection occurred at two time points – the first between 1996 and 1998 (time 1), and the second approximately 10 years later (time 2). Families had at least one biological child between 4 and 14 years of age who had been raised and educated in Canada, and were fluent in English or French. Families were excluded if a parent or child had a chronic physical condition or handicap, or an IQ below 70. Families in which at least one parent had a diagnosis of BD were recruited from psychiatric outpatient clinics in Québec, as well as from advocacy and support groups. Comparison group families, in which neither parent had an affective disorder, were recruited from physicians' offices and community organizations within the same neighbourhoods as the

A 10-YEAR LONGITUDINAL STUDY

families that included a parent presenting with BD. At time 1, parents' mental health status was assessed using the Structured Clinical Interview for DSM-III-R (SCID-I; Spitzer et al., 1992).

Of the 105 families assessed at time 1, 80 (45 families that included a parent with BD, 35 comparison group families) completed the assessment at time 2, indicating an attrition of 24%. Offspring who did not participate in the time 2 follow-up assessment did not differ from those who did on time 1 ratings of childhood behavior problems and IQ. The sample for this study therefore included 138 offspring (69 OBD and 69 ONAD) from these 80 families. Sixty eight of the offspring (29 ONAD, 39 OBD) were female.

At time 1, there was no difference in mean ages of ONAD ($M=7.77$, $SD=2.35$) and OBD ($M=8.45$, $SD=2.44$, $t=-1.46$, $p=.174$). At time 2, the ONAD ($M=18.80$, $SD=3.34$) were slightly younger than the OBD ($M=20.2$, $SD=3.45$, $t=-2.46$, $p=.015$). The parents with no affective disorder had attained higher levels of education ($M=15.84$, $SD=2.28$) than the parents who had BD and their partners (14.43 , $SD=2.58$, $t=3.41$, $p=.001$). Data for task-oriented coping is missing for parents in one OBD family. More detailed demographic and psychosocial information on the study sample is described in Ellenbogen and Hodgins (2004) and Nijjar and colleagues (2014).

At time 2, 43 offspring (15 ONAD, 28 OBD) met DSM-IV-TR (First et al., 2002) criteria for at least one *current* diagnosis, and 73 offspring (27 ONAD, 46 OBD) met criteria for at least one *lifetime* diagnosis (see Table 1).

Measures

Parent assessment at time 1

Diagnoses. The Structured Clinical Interview for DSM-III-R (SCID-I; Spitzer et al., 1992) is a semi-structured diagnostic interview used to assess mental disorders in individuals aged 18 years and above. Independent inter-rater agreements were computed for 15% of the interviews. Agreement between clinicians was excellent, as indicated by the kappa coefficients for diagnoses of bipolar disorder, 1.0, and other mood disorders 1.0 (lifetime and current).

Social support. The Arizona Social Support Interview Schedule (ASSIS; Barrera, 1980) is a 30-item semi-structured interview assessing the size of participants' social network and their satisfaction with the social support they receive. Social support could be provided by any person identified by the participant, including family members, friends, co-workers, a family doctor, etc. The study aimed to assess family-wide social support as a protective factor for children, thus we used the mean ASSIS score of both parents in each family. Internal consistency (Cronbach's $\alpha = 0.74 - 0.78$) for the ASSIS was adequate (Barrera et al., 1980).

Coping. The adult version of the Coping Inventory for Stressful Situations (CISS; Endler & Parker, 1994) is a 48-item self-report questionnaire. It assesses the extent to which individuals engaged in different coping activities following stressful situations, using a five-point scale ranging from 1 (*Not at all*) to 5 (*Very much*). Standardized *T* scores for three primary styles of coping (task-oriented, emotion-focused, and avoidance-oriented) were obtained. For this study focusing on protective factors for offspring, we used only the task-oriented coping scores for both parents in each family. High internal consistency (Cronbach's $\alpha = .78-.88$) and temporal stability have been reported for the CISS (Brands et al. 2014).

Offspring assessment at time 2

Diagnoses and symptoms. The Kiddie Schedule for Affective Disorders and Schizophrenia – Present and Lifetime version (K-SADS; Kaufman & Schweder, 2004) was used

A 10-YEAR LONGITUDINAL STUDY

to assess mental disorders in offspring under 18 years of age, and the SCID-I for DSM-IV-TR (First et al., 2002) was used for those 18 years and above. The number of current (i.e., within the previous month) and lifetime symptoms of depression, anxiety and SUDs were assessed. Both diagnostic instruments demonstrate good psychometric properties (Basco et al., 2000; First et al., 2002; Kaufman et al., 2004). Interrater reliability obtained for 15% of interviews was excellent ($k = 0.82$).

Procedure

Following a telephone screening, all parents completed the SCID-I interview and the ASSIS administered by a trained interviewer in the laboratory or at their homes, and a battery of questionnaires, including the CISS (see Serravalle et al., 2020 for the full data collection). Parents with BD were euthymic during the time 1 assessment protocol.

Approximately 10 years later, parents were contacted to provide consent for adolescent offspring, and adult offspring were directly contacted by study personnel. Offspring were then scheduled to come into the laboratory to undergo a diagnostic assessment (K-SADS or SCID-I), conducted by a trained interviewer. Informed written consent was obtained from parents at time 1, and from parents and offspring at time 2. Offspring participants were compensated \$150 CAD at time 2 for participating in the full data collection. The Ethics Committee of the Université de Montréal and the Human Research Ethics Committee of Concordia University (Montréal, Canada) approved study procedures at time 1 and time 2, respectively.

Statistical analyses

Data were screened and corrected for outliers and distributional anomalies that violated statistical assumptions. Due to the low number of diagnoses in the offspring, clinical and sub-clinical symptom counts of depression and anxiety symptoms combined (i.e., both indicating internalizing problems) and SUDs symptoms were more appropriate for these analyses. Ordinary least squares (OLS) regressions were computed to assess whether parents' social network size, social support satisfaction, and use of task-oriented coping during offspring's middle childhood moderated the relationship between risk status (OBD vs ONAD) and offspring symptoms of anxiety and depression, and SUDs in late adolescence and early adulthood (see Figure 1). A total of six models were run. The first two models estimated offspring symptoms of anxiety and depression, and SUDs at time 2 with offspring risk status, parents' social support satisfaction at time 1 and the interaction between these variables as predictors. The next two models estimated the same two outcomes in offspring with offspring risk status, parents' social network size at time 1 and the interaction between these variables as predictors. The final two models also estimated the same two outcomes in offspring with offspring risk status, parents' use of task-oriented coping at time 1 and the interaction between these variables as predictors. Parents' average education level and offspring age at time 2 were included as covariates in all the models. Analyses were conducted using SPSS (version 27) and the PROCESS (version 4.0; Hayes & Little, 2018) macro for SPSS. Significant interactions (risk status X moderator) were followed up with the Johnson-Neyman technique to assess the regions of significance of the conditional effects along the distribution of values of the continuous moderators. PROCESS conducts tests of significance by constructing 95% bias-corrected confidence intervals. If the confidence intervals do not include zero, the interaction is statistically significant at the .05 level. The bootstrap sample was set at 5000 iterations.

Given the significant difference in mean age across the two groups of offspring at time 2 and in education levels of parents in the two groups, these two variables were included in all regression analyses. Furthermore, given that there are robust sex differences in the development of mental disorders in youth (Kistner, 2009), we examined whether offspring sex moderated the above analyses. Offspring sex did not moderate any of the analyses of the relation between risk status and outcome measure, and thus we dropped offspring sex from the analyses.

Results

Comparison of OBD and ONAD

As presented in Table 1, OBD differed from ONAD on all measures, except number of depression and anxiety symptoms at time 2, and the proportion of offspring with current and lifetime diagnoses for anxiety disorders at time 2. At time 1, parents of ONAD, relative to parents of OBD, reported a larger mean social network, higher mean satisfaction with their social support and greater use of task-oriented coping strategies. Pearson correlations between the independent and dependent variables are shown in Table 2. Parents' use of task-oriented coping positively correlated with parents' mean education level ($r(135)=.26, p=.002$), social network size ($r(135)=.27, p=.002$) and social support satisfaction ($r(135)=.29, p=.001$). Parents' social network size also positively correlated with parents' mean education level ($r(136)=.30, p=.000$) and social support satisfaction ($r(136)=.27, p=.002$), and negatively correlated with offspring's SUDs symptoms at time 2 ($r(136)=-.22, p=.008$).

The effect of parents' social support satisfaction at time 1 on the relationship between offspring risk status and psychopathology symptoms at time 2

The overall OLS regressions model predicting offspring depression and anxiety symptoms at time 2 was not statistically significant ($R^2=.031, F(5,132)=.851, p=.516$), and none of the variables in the model were significant predictors of offspring depression and anxiety symptoms at time 2, including the offspring risk status by parents' social support satisfaction at time 1 interaction term ($b=-.07, t(132)=-.377, p=.707$).

The overall ordinary least squares (OLS) regressions model predicting offspring SUDs symptoms at time 2 was statistically significant, $R^2=.143, F(5, 132)=4.41, p=.001$. The offspring risk status by parents' social support satisfaction interaction term was the only significant predictor ($b=-.43, t(132)=-2.35, p=.020$). The OLS regression model results for all predictors are shown in Table 3. The inclusion of the offspring risk status by parents' social support satisfaction at time 1 interaction term led to a significant increase in model fit, $R^2_{change}=.036, F(1, 132)=5.54, p=.02$. As shown in Figure 1A, analyses of conditional effects of risk status at the 16th, 50th, and 84th percentiles values of parents' social support satisfaction scores revealed robust group differences in SUDs symptoms between OBD and ONAD when parents' social support satisfaction was low (i.e., 16th percentile), $b=1.8, 95\% \text{ CI } [.36, 3.24], t(132)=2.47, p=.015$, but this difference disappeared when parents' social support satisfaction was average (i.e., 50th percentile), $b=.51, 95\% \text{ CI } [-.56, 1.57], t(132)=.935, p=.351$, and high (i.e., 84th percentile), $b=.36, 95\% \text{ CI } [-1.71, 1], t(132)=-.52, p=.604$. That is, the OBD with parents reporting lower social support satisfaction at time 1 had significantly more SUDs symptoms at time 2 than the ONAD whose parents reported similarly low levels of satisfaction with their social support. No group differences in offspring's number of SUDs symptoms at time 2 were observed when parents reported average or high social support satisfaction at time 1.

The effect of parents' social network size at time 1 on the relationship between offspring risk status and psychopathology symptoms at time 2

The overall OLS regression model predicting offspring depression and anxiety symptoms at time 2 was not statistically significant, $R^2=.072$, $F(5,132)=2.06$, $p=.074$. The offspring risk status by parents' social network size at time 1 interaction term was the only significant predictor of time 2 depression and anxiety symptoms in the offspring ($b=.15$, $t(132)=2.50$, $p=.014$). The OLS regression model results for all predictors are shown in Table 4. The offspring risk status by parents' social network size at time 1 interaction term led to a significant increase in model fit, $R^2_{change}=.044$, $F(1, 132)=6.24$, $p=.014$. As shown in Figure 1B, analyses of conditional effects at the 16th, 50th, and 84th percentiles values of parents' social network size revealed robust group differences in offspring depression and anxiety symptoms when parents' social network size was large (i.e., 84th percentile), $b=2.82$, 95% CI [.961, 4.68], $t(132)=3.00$, $p=.003$, but this difference disappeared when parents' social network size was average (i.e., 50th percentile), $b=.568$, 95% CI [-.531, 1.66], $t(132)=1.02$, $p=.308$, and small (i.e., 16th percentile), $b=-.032$, 95% CI [-1.33, 1.27], $t(132)=-.048$, $p=.962$. That is, the OBD with parents that reported having a larger social network at time 1 had significantly more depression and anxiety symptoms at time 2 than the ONAD whose parents had a similarly large social network. No group differences in offspring's number of depression and anxiety symptoms at time 2 were observed when parents reported average or low social network sizes.

The overall OLS regressions model predicting time 2 offspring SUDs symptoms was statistically significant, $R^2=.125$, $F(5, 132)=3.76$, $p=.003$. Parents' social network size at time 1 negatively predicted offspring SUDs symptoms at time 2 ($b=-.12$, $t(132)=-1.97$, $p=.051$), although this fell short of the conventional level of statistical significance. The OLS regression model results for all predictors are shown in Supplementary Table 1. The offspring risk status by parents' social network size at time 1 interaction term was not a significant predictor of time 2 offspring SUDs symptoms ($b=-.09$, $t(132)=-1.47$, $p=.143$) and the interaction term did not lead to a significant increase in model fit ($R^2_{change}=.014$, $F(1, 132)=2.17$, $p=.143$).

The effect of parents' use of task-oriented coping at time 1 on the relationship between offspring risk status and psychopathology symptoms at time 2

The overall OLS regressions model predicting offspring depression and anxiety symptoms at time 2 was not statistically significant ($R^2=.032$, $F(5,131)=.871$, $p=.503$) and none of the variables in the model were significant predictors of offspring depression and anxiety symptoms at time 2, including the offspring risk status by parents' task-oriented coping at time 1 interaction term ($b=-.07$, $t(131)=-.788$, $p=.432$).

The overall OLS regressions model predicting offspring SUDs symptoms at time 2 was statistically significant, $R^2=.103$, $F(5,131)=3.00$, $p=.014$. Parents' level of education negatively predicted time 2 offspring SUDs symptoms ($b=-.41$, $t(131)=-2.00$, $p=.048$). The offspring risk status by parents' task-oriented coping at time 1 interaction term was not a significant predictor ($b=-.05$, $t(131)=-.666$, $p=.507$) and the interaction term did not lead to a significant increase in model fit ($R^2_{change}=.003$, $F(1, 131)=.444$, $p=.507$).

Discussion

Two key findings emerged from the present study. First, as predicted, the OBD whose parents reported lower social support satisfaction while they were in middle childhood had significantly more SUDs symptoms in late adolescence and early adulthood, relative to the

ONAD. When parents reported higher social support satisfaction, OBD and ONAD did not differ in their development of SUDs symptoms. Growing up with parents who were more satisfied with their social support may therefore have acted as a protective factor for OBD. Second, contrary to our hypothesis, having parents with a larger social network during middle childhood was associated with significantly higher depression and anxiety symptoms in late adolescence and young adulthood for OBD, relative to ONAD. No such group differences were found between offspring whose parents reported a smaller social network. Surprisingly, this suggests that having parents with a larger social network acted as a risk factor specifically for the OBD.

The present findings with respect to social support satisfaction are consistent with a study by Ashman and colleagues' (2008) who showed that low social support in depressed mothers increased the likelihood of their children developing externalizing and internalizing problems relative to offspring of parents with no mental disorder. Perceived social support satisfaction predicts positive mental and physical health outcomes, and this relationship appears to be more common than findings linking positive outcomes to the size of one's social network (VanderVoort, 1999). Therefore, perhaps parental social support satisfaction helps buffer the OBD's risk of developing externalizing problems through its protective effects on the parents' mental health (Cohen et al., 2004; Gariépy et al., 2016). Improvement in parents' mental health may influence the development of psychopathology in offspring by improving the quality of child supervision and structure in the home, factors that play a key role in the development of externalizing problems in high risk youth, including the OBD (Costello et al., 2003; Iacono et al., 2018). Overall, this is consistent with previous research showing that parental factors (i.e. personality characteristics, rearing practices and psychological functioning) have an important impact on the OBD's psychological development (Ellenbogen et al., 2004; Iacono et al., 2018; Nunes et al., 2021). However, the specific mechanism(s) by which having parents with higher social support satisfaction attenuates the development of SUDs symptoms in the OBD are still unknown (Klimes-Dougan et al., 2010).

The unexpected finding that the OBD whose parents reported a larger social network developed more depression and anxiety symptoms than the OBD whose parents reported a smaller social network might be related to specific contextual factors associated with families having a parent with BD. Although one might expect that with a larger social network comes a larger availability of social support, network size and quality of support are two distinct characteristics that do not necessarily go hand in hand (Cochran & Niego, 2002; Gottlieb & Bergen, 2010). A person's social network refers to the structure of their social contacts, whereas their perceived social support refers to their beliefs about the amount and quality of support received from their social contacts (Gottlieb et al., 2010). A large social network does not necessarily provide adequate social support, especially for individuals with mental illnesses such as BD who tend to have poorer interpersonal functioning than those with no mental disorder (Eidelman et al., 2012). For persons with BD, having more social contacts may increase the frequency of interpersonal conflicts (Walker et al., 1993). Furthermore, parents with BD, relative to parents with no affective disorder, are more likely to select intimate partners that can hinder, rather than help, the family environment and functioning (Serravalle et al., 2020). Intimate partners of adults with BD, relative to partners of adults with no affective disorder, have more mental disorders, higher neuroticism, lower extraversion, more emotion-focused coping, and report higher levels of verbal aggression towards their partners (Serravalle et al., 2020). Therefore, parents with BD may be more likely to select spouses, friends, and acquaintances that negatively influence the family environment, as well as have extended family who are also

struggling with mental disorders. These problematic influences in the parents' network may then negatively impact the OBD directly through the interactions they have with these individuals and indirectly through the effects these relationships have on the parents' stress levels, rearing practices and parent-child bonding (Cochran et al., 2002; Iacono et al., 2018; Lau et al., 2018).

Contrary to our hypotheses, parents' use of more task-oriented coping during their children's middle childhood did not influence the development of depression, anxiety or SUDs symptoms in late adolescence and young adulthood among the OBD. The coping style of parents with BD is found to influence their own mental well-being and the level of family stress (Fletcher et al., 2013), as well as their offspring's psychosocial functioning during middle childhood (Ellenbogen et al., 2004). However, the present findings suggest that these effects may not play a role in the OBD's development of psychopathology symptoms over time. Given that there is evidence that the OBD adopt more ineffective coping skills as they grow up (Jones et al., 2006; Nijjar et al., 2014), mental health outcomes among the offspring may be influenced by their own coping strategies rather than those of their parents. Unfortunately, the hypothesis that the offspring's coping strategies mediated the link between parents' coping and offspring mental health was not assessed in the present study. Moreover, it is possible that focusing on the type of coping that parents engaged in (i.e., task oriented versus emotion oriented or avoidant) may not be the most accurate way of assessing the quality of their coping. This could partly explain why the task-oriented variable was not associated with the offspring's development the way we expected. In fact, researchers suggest that the quality of a coping strategy varies depending on the type of stressor, and that coping effectiveness might be better understood by assessing coping flexibility. That is, a person's ability to adjust their coping strategies to meet the demands of different stressors might be more important than fixed coping strategies (Kato, 2012). High coping flexibility has been linked to better psychological outcomes (Cheng et al., 2014) and would therefore be worth measuring for future research with similar samples.

The present study is the first longitudinal assessment of the protective effects of parents' social support and coping practices on the OBD's mental health outcomes. There are nonetheless study limitations. First, the measures of social support and coping included in the present study were limited to self-report assessments. The data about these parental variables is thus limited to the perspective of the parents, and does not provide information about the quality and frequency of social contacts, which may be important to consider when interpreting these results. With that said, the present study included assessments of coping and social support by multiple parents in a family, compared to other studies using only a single parent report (e.g., Nunes et al., 2021). Second, the assessment of parents' coping strategies and social support at a single time point, when their children were in middle childhood, limits our conclusions regarding the timing of the reported parent effects on offspring outcomes. That is, it is not known whether the longitudinal relationship between social support in parents and psychiatric symptoms in young adult offspring was due to effects in middle childhood or continuing social support problems in parents when their offspring were in early adulthood. Lastly, the study sample is mostly middle-class and French Canadian; thus the findings might not generalize to a more diverse population of families with a parent having BD.

Taken together, these findings provide evidence that social support satisfaction in parents, but not task-oriented coping strategies, acts as a protective factor against the development of substance use problems in the OBD. This is particularly important, as there is evidence that substance use problems are a substantial negative outcome among the OBD, increasing the risk for future affective disorders (Duffy et al., 2012). In contrast, it appears that a

A 10-YEAR LONGITUDINAL STUDY

larger number of social contacts in families with a parent having BD is associated with an increased risk of depression and anxiety symptoms in their offspring. Future research should assess the quality and type of social support received in parents with BD that have small and large social networks, in order to better understand the mechanisms behind the effects observed in the current study. Overall, these results raise awareness about the environmental factors in parents with BD that may buffer or exacerbate their offspring's risk of developing adverse mental health outcomes. These findings have implications for the development and improvement of intervention and prevention strategies for the offspring of families having a parent with BD. Although current prevention strategies for the OBD focus on the functioning of the nuclear family (Miklowitz et al., 2020; Serravalle et al., 2021), it might be important to promote general and high quality social support from extended family, friends, and the community, in addition to direct family interventions, as a protective factor for these high-risk children.

References

- Ashman, S. B., Dawson, G., & Panagiotides, H. (2008). Trajectories of maternal depression over 7 years: Relations with child psychophysiology and behavior and role of contextual risks. *Development and Psychopathology*, 20(1), 55-77. <https://doi.org/10.1017/S0954579408000035>
- Barker, E. D., Copeland, W., Maughan, B., Jaffee, S. R., & Uher, R. (2012). Relative impact of maternal depression and associated risk factors on offspring psychopathology. *British Journal of Psychiatry*, 200(2), 124-129. <https://doi.org/10.1192/bjp.bp.111.092346>
- Barrera, M. Jr. (1980). A method for the assessment of social support networks in community survey research. *Connection*, 3, 8-13.
- Basco, M. R., Bostic, J. Q., Davies, D., Rush, A. J., Witte, B., Hendrickse, W., & Barnett, V. (2000). Methods to improve diagnostic accuracy in a community mental health setting. *American Journal of Psychiatry*, 157, 1599-1605. <https://doi.org/10.1176/appi.ajp.157.10.1599>
- Bella, T., Goldstein, T., Axelson, D., Obreja, M., Monk, K., Hickey, M.B.,... & Sakolsky, D. (2011). Psychosocial functioning in offspring of parents with bipolar disorder. *Journal of Affective Disorders*, 133, 204-211. <https://doi.org/10.1016/j.jad.2011.03.022>
- Brands, I. M. H., Köhler, S., Stapert, S. Z., Wade, D. T., & van Heugten, C. M. (2014). Psychometric properties of the Coping Inventory for Stressful Situations (CISS) in patients with acquired brain injury. *Psychological Assessment*, 26(3), 848-856. <https://doi.org/10.1037/a0036275>
- Brietzke, E., Mansur, R.B., Soczynska, J.K., Kapczinski, F., Bressan, R.A., & McIntyre, R.S. (2012). Towards a multifactorial approach for prediction of bipolar disorder in at risk populations. *Journal of Affective Disorders*, 140, 82-91. <https://doi.org/10.1016/j.jad.2012.02.016>
- Borowiecka-Karpiuk, J., Dudek, D., Siwek, M., & Jaeschke, R. (2014). Spousal burden in partners of patients with major depressive disorder and bipolar disorder. *Psychiatr. Pol*, 48(4), 773-787. <https://pubmed.ncbi.nlm.nih.gov/25314803/>
- Boyers, G. B., & Simpson Rowe, L. (2018). Social support and relationship satisfaction in bipolar disorder. *Journal of Family Psychology*, 32(4), 538-543. <https://doi.org/10.1037/fam0000400>
- Calam, R., Jones, S., Sanders, M. R., Dempsey, R., & Sadhnani, V. (2012). Parenting and the emotional and behavioural adjustment of young children in families with a parent with bipolar disorder. *Behavioural and Cognitive Psychotherapy*, 40, 425-437. <https://doi.org/10.1017/S1352465812000094>
- Chang, K. D., Blasey, C., Ketter, T. A., & Steiner, H. (2001). Family environment of children and adolescents with bipolar parents. *Bipolar Disorders*, 3(2), 73-78. <https://doi.org/10.1034/j.1399-5618.2001.030205.x>
- Cheng, C., Lau, H. P., & Chan, M. P. (2014). Coping flexibility and psychological adjustment to stressful life changes: a meta-analytic review. *Psychological bulletin*, 140(6), 1582-1607. <https://doi.org/10.1037/a0037913>
- Cochran, M., & Niego, S. (2002). Parenting and social networks. In M. H. Bornstein (Ed.), *Handbook of parenting: Social conditions and applied parenting* (pp. 123-148). Lawrence Erlbaum Associates Publishers.
- Cohen, A. N., Hammen, C., Henry, R. M., & Daley, S. E. (2004). Effects of stress and social

A 10-YEAR LONGITUDINAL STUDY

- support on recurrence in bipolar disorder. *Journal of Affective Disorders*, 82(1), 143–147. <https://doi.org/10.1016/j.jad.2003.10.008>
- Cohen S. (2004). Social relationships and health. *American Psychologist*, 59(8), 676–684. <https://doi.org/10.1037/0003-066X.59.8.676>
- Conus, P., Macneil, C., & McGorry, P. D. (2014). Public health significance of bipolar disorder: implications for early intervention and prevention. *Bipolar Disorders*, 16(5), 548–556. <https://doi.org/10.1111/bdi.12137>
- Costello, E. J., Compton, S. N., Keeler, G., & Angold, A. (2003). Relationships between poverty and psychopathology: a natural experiment. *JAMA*, 290(15), 2023–2029. <https://doi.org/10.1001/jama.290.15.2023>
- Cranford J. A. (2004). Stress-buffering or stress-exacerbation? Social support and social undermining as moderators of the relationship between perceived stress and depressive symptoms among married people. *Personal Relationships*, 11(1), 23–40. <https://doi.org/10.1111/j.1475-6811.2004.00069.x>
- Duffy, A., Goodday, S., Keown-Stoneman, C., & Grof, P. (2019). The Emergent Course of Bipolar Disorder: Observations Over Two Decades From the Canadian High-Risk Offspring Cohort. *American Journal of Psychiatry*, 176(9), 720–729. <https://doi.org/10.1176/appi.ajp.2018.18040461>
- Duffy, A., Horrocks, J., Doucette, S., Keown-Stoneman, C., McCloskey, S., & Grof, P. (2014). The developmental trajectory of bipolar disorder. *British Journal of Psychiatry*, 204(2), 122–128. <https://doi.org/10.1192/bjp.bp.113.126706>
- Duffy, A., Horrocks, J., Milin, R., Doucette, S., Persson, G., & Grof, P. (2012). Adolescent substance use disorder during the early stages of bipolar disorder: a prospective high-risk study. *Journal of Affective Disorders*, 142(1-3), 57–64. <https://doi.org/10.1016/j.jad.2012.04.010>
- Eidelman, P., Gershon, A., Kaplan, K., McGlinchey, E., & Harvey, A. G. (2012). Social support and social strain in inter-episode bipolar disorder. *Bipolar Disorders*, 14(6), 628–640. <https://doi.org/10.1111/j.1399-5618.2012.01049.x>
- Ellenbogen, M. A., & Hodgins, S. (2004). The impact of high neuroticism in parents on children's psychosocial functioning in a population at high risk for major affective disorder: A family–environmental pathway of intergenerational risk. *Development and Psychopathology*, 16(01). <https://doi.org/10.1017/s0954579404044438>
- Endler, N. S., & Parker, J. D. A. (1994). Assessment of multidimensional coping: Task, emotion, and avoidance strategies. *Psychological Assessment*, 6(1), 50–60. <https://doi.org/10.1037/1040-3590.6.1.50>
- Espinosa, A., & Rudenstine, S. (2020). The contribution of financial well-being, social support, and trait emotional intelligence on psychological distress. *British Journal of Clinical Psychology*, 59(2), 224–240. <https://doi.org/10.1111/bjc.12242>
- Fletcher, K., Parker, G. B., & Manicavasagar, V. (2013). Coping profiles in bipolar disorder. *Comprehensive Psychiatry*, 54(8), 1177–1184. <https://doi.org/10.1016/j.comppsy.2013.05.011>
- First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. B. W. (2002). *Structured Clinical Interview for DSM-IV-TR Axis I Disorders, research version, non-patient edition* (SCID-I/NP). New York: New York State Psychiatric Institute, Biometrics Research.
- Gariépy, G., Honkaniemi, H., & Quesnel-Vallée, A. (2016). Social support and protection from

A 10-YEAR LONGITUDINAL STUDY

- depression: systematic review of current findings in Western countries. *British Journal of Psychiatry*, 209(4), 284–293. <https://doi.org/10.1192/bjp.bp.115.169094>
- Goodday, S. M., Bentall, R., Jones, S., Weir, A., & Duffy, A. (2019). Coping strategies and self-esteem in the high-risk offspring of bipolar parents. *Australian & New Zealand Journal of Psychiatry*, 53(2), 129-135. <https://doi.org/10.1177/0004867418761577>
- Gottlieb, B. H., & Bergen, A. E. (2010). Social support concepts and measures. *Journal of Psychosomatic Research*, 69(5), 511-520. <https://doi.org/10.1016/j.jpsychores.2009.10.001>
- Grande, I., Berk, M., Birmaher, B., & Vieta, E. (2016). Bipolar disorder. *Lancet*, 387(10027), 1561-1572. [http://dx.doi.org/10.1016/S0140-6736\(15\)00241-X](http://dx.doi.org/10.1016/S0140-6736(15)00241-X)
- Hayes, A. F. (2018). *Introduction to mediation, moderation, and conditional process analysis a regression-based approach*. Guilford Press.
- Holt-Lunstad, J., Smith, T. B., & Layton, J. B. (2010). Social relationships and mortality risk: a meta-analytic review. *PLoS Medicine*, 7(7), e1000316. <https://doi.org/10.1371/journal.pmed.1000316>
- Higgins, J. E., & Endler, N. S. (1995). Coping, life stress, and psychological and somatic distress. *European Journal of Personality*, 9(4), 253-270 <https://doi.org/10.1002/per.2410090403>
- Hughes, C., Devine, R. T., Foley, S., Ribner, A. D., Mesman, J., & Blair, C. (2020). Couples becoming parents: Trajectories for psychological distress and buffering effects of social support. *Journal of Affective Disorders*, 265, 372-380. <https://doi.org/10.1016/j.jad.2020.01.133>
- Iacono, V., Beaulieu, L., Hodgins, S., & Ellenbogen, M.A. (2018). Parenting practices in middle childhood mediate the relation between growing up with a parent having bipolar disorder and offspring psychopathology from childhood into early adulthood. *Development and Psychopathology*, 30, 635-649. <https://doi.org/10.1017/S095457941700116X>
- Jones, S. H., Tai, S., Evershed, K., Knowles, R., & Bentall, R. (2006). Early detection of bipolar disorder: a pilot familial high-risk study of parents with bipolar disorder and their adolescent children. *Bipolar Disorders*, 8(4), 362–372. <https://doi.org/10.1111/j.1399-5618.2006.00329.x>
- Kato T. (2012). Development of the Coping Flexibility Scale: evidence for the coping flexibility hypothesis. *Journal of counseling psychology*, 59(2), 262–273. <https://doi.org/10.1037/a0027770>
- Kaufman, J., & Schweder, A. E. (2004). The Schedule for Affective Disorders and Schizophrenia for School-Age Children: Present and Lifetime version (K-SADS-PL). In M. J. Hilsenroth & D. L. Segal (Eds.), *Comprehensive handbook of psychological assessment: Vol. 2. Personality assessment* (pp. 247–255). New York: Wiley.
- Kistner, J. A. (2009). Sex differences in child and adolescent psychopathology: an introduction to the special section. *Journal of Clinical Child & Adolescent Psychology*, 38(4), 453-459. <https://doi.org/10.1016/j.neubiorev.2017.07.005>
- Klimes-Dougan, B., Long, J. D., Lee, C. Y., Ronsaville, D. S., Gold, P. W., & Martinez, P. E. (2010). Continuity and cascade in offspring of bipolar parents: a longitudinal study of externalizing, internalizing, and thought problems. *Development and Psychopathology*, 22(4), 849–866. <https://doi.org/10.1017/S0954579410000507>
- Lau, P., Hawes, D. J., Hunt, C., Frankland, A., Roberts, G., Wright, A., ... & Mitchell, P. B.

A 10-YEAR LONGITUDINAL STUDY

- (2018). Family environment and psychopathology in offspring of parents with bipolar disorder. *Journal of Affective Disorders*, 226, 12-20. <https://doi.org/10.1016/j.jad.2017.09.010>
- Liga, F., Inguglia, C., Gugliandolo, M. C., Inguglia, S., & Costa, S. (2020). The socialization of coping strategies in adolescence: The modeling role of parents. *Anxiety, Stress, & Coping*, 33(1), 47-58. <https://doi.org/10.1080/10615806.2019.1666248>
- Marroquín, B., Tennen, H., & Stanton, A. L. (2017). Coping, emotion regulation, and well being: Intrapersonal and interpersonal processes. In M. D. Robinson & M. Eid (Eds.), *The happy mind: Cognitive contributions to well-being* (pp. 253–274). Springer International Publishing/Springer Nature. https://doi.org/10.1007/978-3-319-58763-9_14
- McGuffin, P., Rijdsdijk, F., Andrew, M., Sham, P., Katz, R., & Cardno, A. (2003). The Heritability of Bipolar Affective Disorder and the Genetic Relationship to Unipolar Depression. *Arch Gen Psychiatry*, 60(5):497–502. <https://doi.org/10.1001/archpsyc.60.5.497>
- Michalak, E. E., Yatham, L. N., Kolesar, S., & Lam, R. W. (2006). Bipolar Disorder and Quality of Life: A Patient-Centered Perspective. *Quality of Life Research*, 15(1), 25–37. <https://doi.org/10.1007/s11136-005-0376-7>
- Miklowitz, D. J., Schneck, C. D., Walshaw, P. D., Singh, M. K., Sullivan, A. E., Suddath, R. L., Forgey Borlik, M., Sugar, C. A., & Chang, K. D. (2020). Effects of Family-Focused Therapy vs Enhanced Usual Care for Symptomatic Youths at High Risk for Bipolar Disorder: A Randomized Clinical Trial. *JAMA Psychiatry*, 77(5), 455–463. <https://doi.org/10.1001/jamapsychiatry.2019.4520>
- Moon, E., Chang, J. S., Choi, S., Ha, T. H., Cha, B., Cho, H. S., Park, J. M., Lee, B. D., Lee, Y. M., Choi, Y., & Ha, K. (2014). Characteristics of stress-coping behaviors in patients with bipolar disorders. *Psychiatry Research*, 218(1-2), 69–74. <https://doi.org/10.1016/j.psychres.2014.03.047>
- Nijjar, R., Ellenbogen, M.A., & Hodgins, S. (2014). Personality, coping, risky behaviour and mental disorders in the offspring of parents with bipolar disorder: a comprehensive psychosocial assessment. *Journal of Affective Disorders*, 166, 315-323. <https://doi.org/10.1016/j.jad.2014.04.047>
- Nunes, C., Martins Cátia, Ayala-Nunes, L., Matos, F., Costa, E., & Gonçalves Andrea. (2021). Parents' perceived social support and children's psychological adjustment. *Journal of Social Work*, 21(3), 497–512. <https://doi.org/10.1177/1468017320911614>
- Ostiguy, CS, Ellenbogen, MA, Linnen, AM. (2009) Chronic stress and stressful life events in the offspring of parents with bipolar disorder. *Journal of Affective Disorders* 114, 74–84.
- Ostiguy, C. S., Ellenbogen, M. A., & Hodgins, S. (2012). Personality of parents with bipolar disorder and interpersonal functioning among their offspring: A prospective 10-year study. *Development and Psychopathology*, 24(2), 573–587. <https://doi.org/10.1017/S095457941200017X>
- Ostiguy, C. S., Ellenbogen, M. A., Walker, C.-D., Walker, E. F., & Hodgins, S. (2011). Sensitivity to stress among the offspring of parents with bipolar disorder: a study of daytime cortisol levels. *Psychological Medicine*, 41(11), 2447–2457. <https://doi.org/10.1017/S0033291711000523>
- Rasic, D., Hajek, T., Alda, M., & Uher, R. (2014). Risk of mental illness in offspring of parents

A 10-YEAR LONGITUDINAL STUDY

- with schizophrenia, bipolar disorder, and major depressive disorder: A meta-analysis of family high-risk studies. *Schizophrenia Bulletin*, 40(1), 28-38. <https://doi.org/10.1093/schbul/sbt114>
- Serravalle, L., Iacono, V., Hodgins, S., & Ellenbogen, M. A. (2020). A comprehensive assessment of personality traits and psychosocial functioning in parents with bipolar disorder and their intimate partners. *International Journal of Bipolar Disorders*, 8(1), 8. <https://doi.org/10.1186/s40345-019-0172-x>
- Serravalle, L., Iacono, V., Wilson, A. L., Orlando, M. A., Tsekova, V., & Ellenbogen, M. A. (2021). Improved Parent-Child Interactions Predict Reduced Internalizing Symptoms Among the Offspring of Parents with Bipolar Disorder Undergoing a Prevention Program: A Proof-of-Concept Study. *Research on Child and Adolescent Psychopathology*, 49(6), 817–830. <https://doi.org/10.1007/s10802-020-00743-3>
- Skinner, E. A., & Zimmer-Gembeck, M. (2015). Coping across the lifespan. *International Encyclopedia of the Social & Behavioral Sciences*, 887–894. <https://doi.org/10.1016/b978-0-08-097086-8.26015-7>
- Skinner, E. A., & Zimmer-Gembeck, M. (2016). Coping. *Encyclopedia of Mental Health*, 350–357. <https://doi.org/10.1016/B978-0-12-397045-9.00036-7>
- Smetanin, P., Stiff, D., Briante, C., Adair, C.E., Ahmad, S. & Khan, M. (2011). The Life and Economic Impact of Major Mental Illnesses in Canada: 2011 to 2041. *RiskAnalytica, on behalf of the Mental Health Commission of Canada 2011*. https://www.mentalhealthcommission.ca/sites/default/files/MHCC_Report_Base_Case_FINAL_ENG_0_0.pdf
- Spitzer, R. L., Williams, J. B., Gibbon, M., & First, M. B. (1992). The Structured Clinical Interview for DSM-III-R (SCID): I. History, rationale, and description. *Archives of General Psychiatry*, 49, 624–629. <https://doi.org/10.1001/archpsyc.1992.01820080032005>
- Vance, Y. H., Huntley, J. S., Espie, J., Bentall, R., & Tai, S. (2008). Parental communication style and family relationships in children of bipolar parents. *British Journal of Clinical Psychology*, 47, 355–359. <https://doi.org/10.1348/014466508X282824>
- VanderVoort, D. (1999). Quality of social support in mental and physical health. *Current Psychology: A Journal for Diverse Perspectives on Diverse Psychological Issues*, 18(2), 205–222. <https://doi.org/10.1007/s12144-999-1029-8>
- Walker, M. E., Wasserman, S., & Wellman, B. (1993). Statistical models for social support networks. *Sociological Methods & Research*, 22(1), 71-98. <https://doi.org/10.1177/0049124193022001004>
- Waylen, A., & Stewart-Brown, S. (2010). Factors influencing parenting in early childhood: a prospective longitudinal study focusing on change. *Child: Care, Health and Development*, 36(2), 198-207. <https://doi.org/10.1111/j.1365-2214.2009.01037.x>
- Whitney, J., Howe, M., Shoemaker, V., Li, S., Sanders, E.M., Dijamco, C., ... & Chang, K. (2013). Socio-emotional processing and functioning of youth at high risk for bipolar disorder. *Journal of Affective Disorders*, 148, 112-117. <https://doi.org/10.1016/j.jad.2012.08.016>
- Zuckerman, M. (1999). Diathesis-stress models. In , *Vulnerability to psychopathology: A biosocial model* (pp. 3-23). Washington, DC, US: American Psychological Association. <https://doi.org/10.1037/10316-001>

Tables and Figures

Table 1.

Comparisons of time 1 parent reports of social support and task oriented coping per offspring, and time 2 offspring symptoms and diagnoses of mental disorders

	ONAD	OBD	
Time 1 (1996 – 1998)			
<i>n</i>	69	69	
	<i>M (SD)</i>	<i>M (SD)</i>	<i>t</i>
Parents' social network size ^b	17.55 (10.42)	11.81 (7.10)	3.78**
Parents' social support satisfaction ^b	27.96 (2.34)	25.66 (2.99)	5.03**
Parents' task-oriented coping ^c	52.71 (5.66) ^d	48.34 (6.81)	4.08**
Time 2 (2006 – 2008)			
<i>n</i>	69	69	
Offspring variables	<i>M (SD)</i>	<i>M (SD)</i>	<i>t</i>
Depression & anxiety symptoms ^e	4.39 (5.12)	6.26 (6.50)	-1.88
SUDs symptoms ^e	1.62 (4.41)	4.30 (6.76)	-2.76**
	<i>n (%)</i>	<i>n (%)</i>	
At least one <i>current</i> diagnosis ^e	15 (21.7)	28 (40.6)	-2.42*
Affective disorder ^e	0 (0)	4 (5.8)	-2.05*
Anxiety disorder ^e	10 (14.5)	16 (23.2)	-1.31
SUDs ^e	4 (5.8)	13 (18.8)	-2.36*
At least one <i>lifetime</i> diagnosis ^e	27 (39.1)	46 (66.7)	-3.35**
Affective disorder ^e	8 (11.6)	22 (31.9)	-2.96**
Anxiety disorder ^e	13 (18.8)	21 (30.4)	-1.54
SUDs ^e	8 (11.6)	24 (34.8)	-3.33**

ONAD = offspring of parents with no affective disorder

OBD = offspring of parents with bipolar disorder

a From the Arizona Social Support Interview Schedule

b Scores obtained by calculating the mean ASSIS score across parents for each family

c From the Coping Inventory of Stressful Situations

d *n* = 68; data missing for one family

e From the Structured Clinical Interview for DSM-IV-TR or Kiddie Schedule for Affective Disorders and Schizophrenia

p* < .05. *p* < .01.

A 10-YEAR LONGITUDINAL STUDY

Table 2.

Pearson correlation coefficients for study variables

Variable	1	2	3	4	5	6	7	8
1. Offspring risk status ^a	–	-.28**	-.31**	-.40**	-.33**	.21*	.16	.23**
2. Parents' mean education level		–	.30**	.18*	.26**	-.06	-.03	-.22*
3. Parents' social network size			–	.27**	.27**	-.09	-.04	-.22**
4. Parents' social support satisfaction				–	.29**	-.01	-.02	-.19*
5. Parents' task-oriented coping					–	-.14	-.03	-.07
Offspring outcomes at time 2								
6. Offspring age						–	.09	.18*
7. Depression & anxiety symptoms							–	.21*
8. SUDs symptoms								–

Note. * $p < .05$. ** $p < .01$.

^a ONMD = -1, OBD = 1

Table 3

Results of ordinary least squares (OLS) regression model predicting offspring SUDs symptoms at time 2 from offspring risk status (X), parents' social support satisfaction at time 1 (W) and the X by W interaction term

Model	Estimate (b)	SE	95% CI		p
			LL	UL	
Risk status (X)	.803	.542	-.269	1.875	.141
Parents' social support satisfaction (W)	-.144	.183	-.504	.217	.432
Offspring age	.226	.140	-.051	.502	.109
Mean parent education	-.300	.196	-.688	.088	.128
X by W interaction	-.430	.183	-.792	-.069	.020*

Note. * $p < .05$.

LL = lower limit; *UL* = upper limit.

Table 4

Results of ordinary least squares (OLS) regression model predicting offspring depression and anxiety symptoms at time 2 from offspring risk status (X), parents' social network size at time 1 (W) and the X by W interaction term

Model	Estimate (b)	SE	95% CI		p
			LL	UL	
Risk status (X)	1.05	.543	-.025	2.123	.055
Parents' social network size (W)	.064	.062	-.059	.187	.304
Offspring age	.061	.147	-.231	.352	.682
Mean parent education	-.037	.211	-.455	.381	.682
X by W interaction	.151	.061	.032	.271	.014*

Note. * $p < .05$.

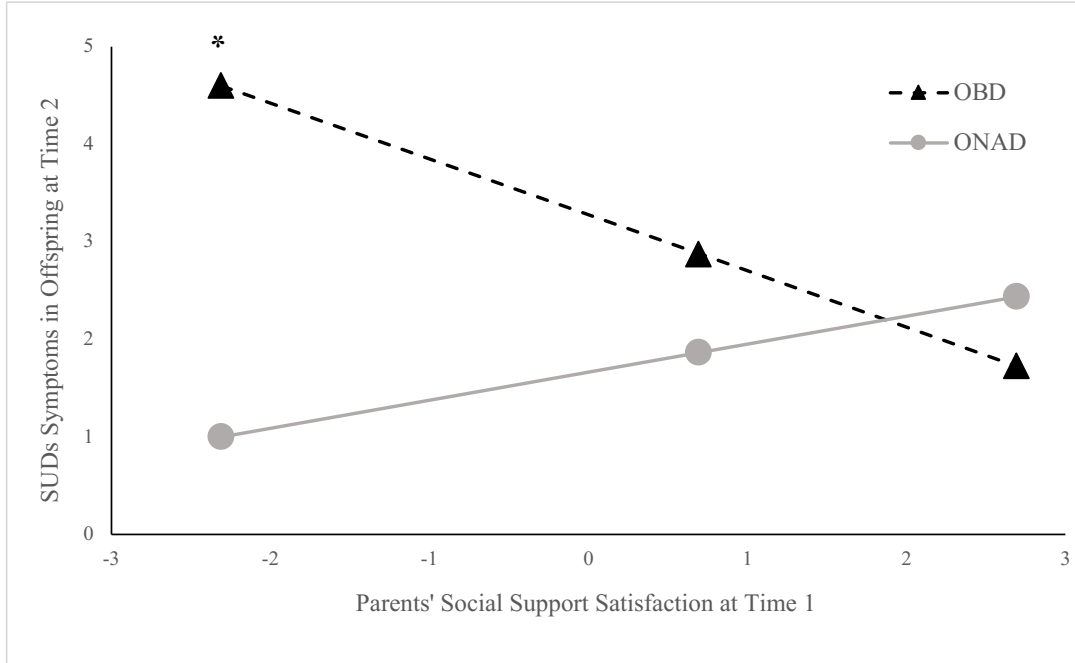
LL = lower limit; *UL* = upper limit.

A 10-YEAR LONGITUDINAL STUDY

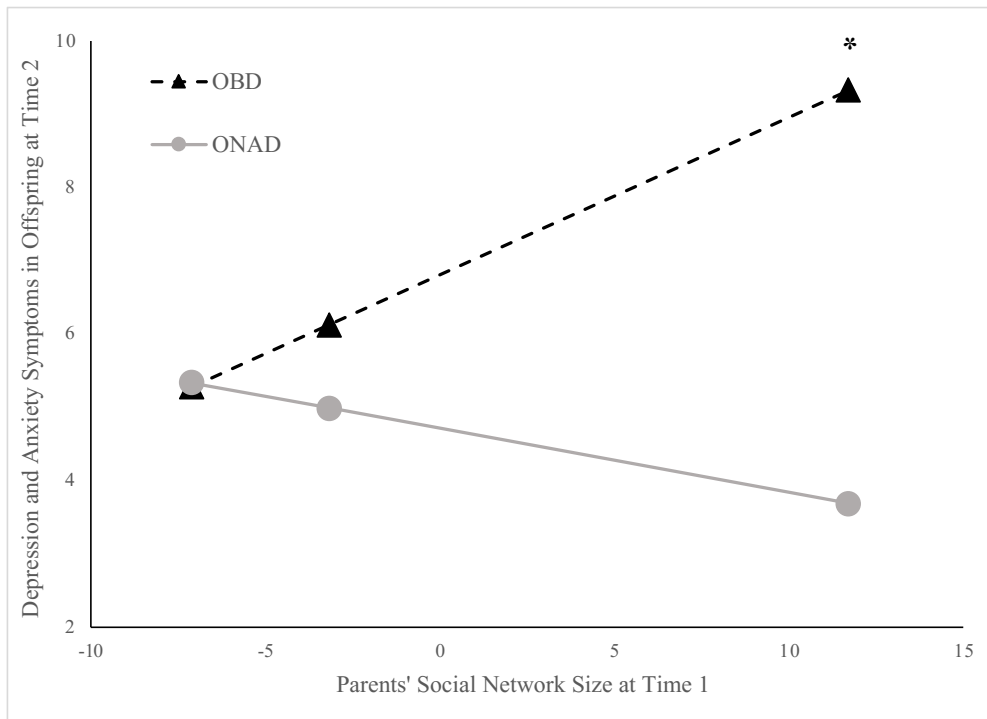
Figure 1.

Differences in psychopathology symptoms of OBD and ONAD at time 2 according to levels of parental social support satisfaction and social network size at time 1.

A.



B.



Note: values on the x-axis in standardized units

* $p < .05$

Supplementary Materials

Figure 1. Moderation model of the effect of offspring risk status (X) on offspring psychopathology symptoms at time 2 (Y) as moderated by parents' psychosocial variables at time 1 (W)

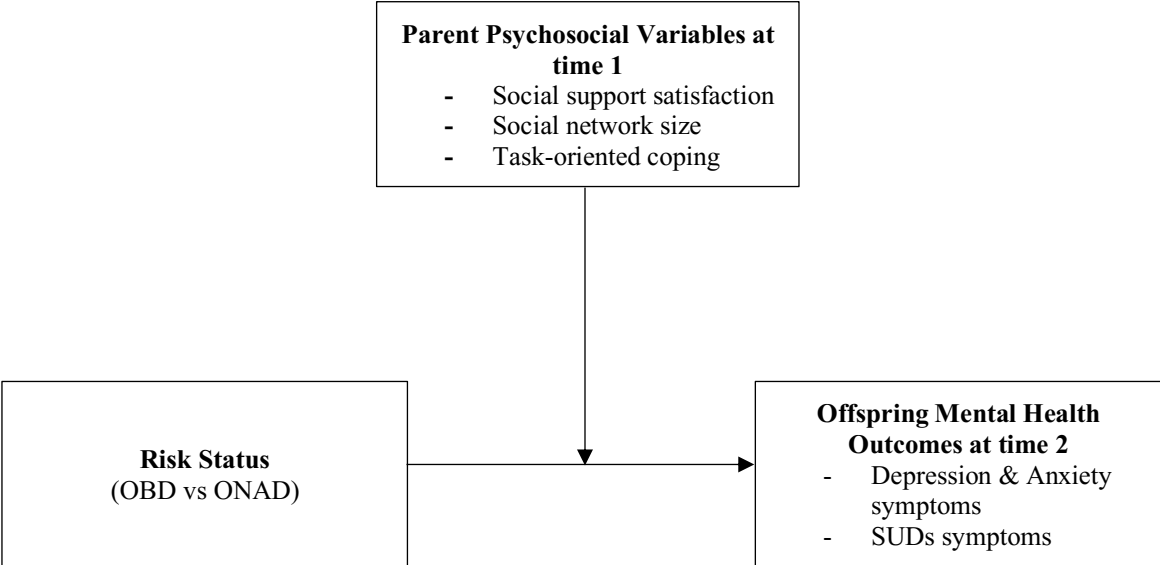


Table 1.

Results of ordinary least squares (OLS) regression model predicting offspring SUDs symptoms at time 2 from offspring risk status (X), parents' social network size at time 1 (W) and the X by W interaction term

Model	Estimate (b)	SE	95% CI		p
			LL	UL	
Risk status (X)	.641	.522	-.391	1.673	.221
Parents' social network size (W)	-.118	.060	-.235	.000	.051
Offspring age	.242	.142	-.038	.522	.090
Mean parent education	-.269	.203	-.671	.133	.187
X by W interaction	-.086	.058	-.201	.030	.143

Note. * $p < .05$.

LL = lower limit; *UL* = upper limit.