INTERPERSONAL FUNCTIONING AMONG ADOLESCENT OFFSPRING OF

PARENTS WITH BIPOLAR DISORDER: AN EVENT-CONTINGENT RECORDING

STUDY

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ABSTRACT

Interpersonal Functioning among Adolescent Offspring of Parents with Bipolar Disorder: An Event-Contingent Recording Study

Anne-Marie Linnen

Abnormal patterns of interpersonal behavior may represent a putative prodromal feature of major affective disorder (Hammen 2002). However, no studies have examined the naturalistic patterns of interpersonal behaviour among the adolescent offspring of parents with BD. The present study examined patterns of interpersonal functioning among 25 adolescents having a parent with BD (high risk) and 23 controls (low risk), between 15 to 25 years of age. Using event-contingent recording procedures in the natural environment, we assessed five dimensions of interpersonal behaviour: quarrelsomeness, agreeableness, dominance, submissiveness, and impulsivity. Behaviours were measured during social interactions occurring over 14 days. Multilevel modeling analyses indicated that the high risk group displayed more impulsive behaviours during social interactions than the low risk group, although this fell short of statistical significance ($t = -1.88$, $p < .056$). Group by gender interactions revealed that high risk males displayed significantly more quarrelsome behaviours during social interactions than high risk females and control participants ($F = 7.49$, $p < .05$). These results are consistent with previous findings suggesting that externalizing behaviour problems precede the development of major affective disorder, and indicate that impulsiveness and quarrelsomeness during social interactions might be an important developmental antecedent of mood disorders among the adolescent offspring of parents with BD.

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STUDY

Offspring of parents with bipolar disorder (BD) are four times more likely to

develop an affective disorder than offspring of parents with no mental disorder (NMD)

(Lapalme, Hodgins, & LaRoche, 1997). Because rates of mood disorder are elevated in

offspring of parents with BD (Reichart et al., 2004), these populations present a unique

opportunity to examine the developmental antecedents of mood disorders. Although

having a parent with BD confers a higher genetic predisposition for the development of

mood disorders (Meiser et al., 2005), environmental variables also play an important role

in their evolution (DelBello & Geller, 2001). Children of parents with BD, in comparison

with controls, are often exposed to unstable family environments characterized by lack of

family cohesion and greater family conflict (Chang, Glasey, Ketter, & Steiner, 2001).

Moreover, when communicating with their children, bipolar mothers tend to express

more negative judgments and to display more frequent negative affect than mothers who

are well (Inoff-Germain, Nottelmain, & Radke-Yarrow, 1992). These poor parent-child

interactions can have negative consequences on the psychosocial development of children

(Marchand, Schedler, & Wagstaff, 2004).

This might explain why poor psychosocial functioning is associated with the

presence of pediatric BD. Rucklidge (2006) examined adolescents with and without

pediatric BD and found that the adolescents with BD had poorer coping strategies and

had greater difficulty regulating emotion in anger provoking situations. Moreover,

children and adolescents with BD have been shown to display behavioural problems

leading to frequent diagnoses of comorbid externalizing disorders such as conduct

disorder and attention hyperactivity disorder (Masi et al., 2003). Although poor

psychosocial functioning may simply be an associated feature of pediatric BD, it could

also represent a developmental risk factor for the onset of major affective disorder,

including BD. As such, poor psychosocial functioning should precede the onset of major

affective disorder and should be more prevalent in populations at high risk for mood

disorders than in non-risk populations.

Studies investigating the psychosocial functioning of children at risk for BD have

yielded inconsistent results. Anderson and Hammen (1993) reported poorer psychosocial

outcomes for children with unipolar depressed mothers than for the children with bipolar

mothers. In fact, the children of unipolar mothers displayed more problematic school

behaviours and suffered from significantly more internalizing behaviour problems than

either the children of bipolar mothers or the children of well mothers. On the other hand,

the children of bipolar mothers did not differ significantly from the children of well

mothers. Anderson and Hammen (1993) interpreted these results by suggesting that the

unipolar women in the sample suffered from many more depressive episodes than the

bipolar women, which may have contributed to more negative mother-child interactions

in these families. Hammen has contended that the intergenerational transmission of

depression occurs in a distinct social context typified by more negative parent-child

interactions. As a result, children of affectively ill parents are more prone to suffer from

psychosocial impairments that potentially predispose them to develop affective disorders.

In line with this theory, children of parents with BD who are exposed to poor

parenting practices also appear to suffer from emotional-behavioural problems

(Ellenbogen & Hodgins, 2004). Moreover, these problems appear during early development. In a sample of 2-year-old children, the offspring of parents with BD were shown to display significantly more hostility and maladaptive patterns of aggression, when interacting with peers, than their control counterparts (Zahn Waxler et al., 1984). In a follow up study conducted 4 years later, the same children continued to display substantial behavioural problems (Zahn Waxler et al., 1988). Laboratory based observations revealed that the proband children exhibited greater difficulties in empathy or role taking when interacting with peers. Moreover, they showed poor coping strategies in situations of anger and conflict and reported more internalizing problems than the control children. These studies demonstrate that children at risk for affective disorders begin to display deficits in psychosocial functioning from an early age. Furthermore, it would appear that problem behaviours displayed during preschool tend to persist into childhood and possibly worsen in intensity.

In support of this contention, Radke-Yarrow and colleagues (1992) performed a study demonstrating that by middle and late childhood, both children of unipolar and bipolar parents exhibited more disruptive and depressive problems compared with children of normal control mothers. In contrast to the study conducted by Anderson and Hammen (1990), the two high risk groups did not differ from one another on measures of psychosocial functioning. From their prospective design, Radke-Yarrow et al. (1992) determined that the number and severity of the problems increased over time in both the high risk groups. However, the rate of change in psychosocial impairment was steeper for the children of parents with BD than for children of parents with unipolar depression. In fact, children of parents with BD exhibited many more behavioural-emotional problems

in late childhood than in preschool. As such, the authors posited that children might be more vulnerable to the interpersonal stresses created by parental bipolar illness near the end of childhood. However, from this study, it remains undetermined if offspring of parents with BD who experience emotional-behavioural problems in childhood continue to do so in adolescence and whether they show a trajectory that increases their risk of developing mood disorders in adulthood.

Externalizing behaviour problems have been implicated in the etiology of affective disorder, particularly with respect to BD. Carlson and Weintraub (1993) examined the relationship between adult mood disorders and childhood behavioural problems in offspring of parents with BD and in a matched control group. Affective symptomatology measured in adulthood was significantly related to having behaviour problems in childhood, but only for the high risk group. Results of this study reveal that externalizing behaviour problems may represent an important prodrome of mood disorders in offspring of parents with BD. Because internalizing problems were not measured in this study, it is uncertain if it they would have predicted affective symptomatology in either, or both, groups. Moreover, because the sample ranged in age from early childhood to late adolescence, it remains tenuous if externalizing problems presented a higher risk for the onset of mood disorders at one developmental stage or another.

Because adolescence forms the transitional period into adulthood, it may represent an important phase in the evolution of affective disorders (Walker, Sabuwalla , & Huot, 2004). However, adolescence is a developmental period that has been understudied in offspring of parents with BD. Research in non-risk samples has

demonstrated that internalizing and externalizing problems tend to endure throughout adolescence (Dekovic, Buist, & Reitz, 2004) and to persist into young adulthood (Ferdinand, Verhulst, & Wiznitzer, 1995). Studies have also demonstrated that emotional-behavioural problems in adolescence are better predictors of the development of mood disorders than emotional-behavioural problems in childhood (Reinhartz et al., 2003; Roza, Hofstra, Ende, & Verhulst, 2003). These findings lead us to believe that the presence of emotional-behavioural problems among adolescents of parents with BD may represent an important marker for the development of mood disorders in adulthood. We hypothesize that adolescents of parents with BD exhibit significantly more emotional-behavioural problems than adolescents of control parents.

Considering the lack of research in this area, we set out to test this theory by examining patterns of psychosocial functioning among a sample of adolescent offspring of parents with BD and adolescent offspring of parents with NMD. Unique to this type of research, we assessed psychosocial functioning via measurements of interpersonal behaviours occurring in the natural environment. Previous research in this area has mostly focused on measuring internalizing and externalizing behaviours using data provided by multiple informants (i.e., parents, teachers, participants) and/or laboratory based observations. Although these methods are informative, they also have important limitations. For instance, by relying on external reports of psychosocial functioning, researchers are assessing perceptions of behaviour that could be biased. For example, depressed mothers appear to have a greater tendency to focus on the negative aspects of their children's behaviour than mothers who are well (Boyle & Pickles, 1997). While laboratory based observations provide more objective behavioural measurements, target

behaviours are assessed in artificial situations and at singular points in time, which may not be representative of how participants really behave in the natural environment. In order to circumvent these limitations, we measured interpersonal behaviours using event contingent recording, a reliable and validated method of sampling interpersonal behaviours as they occur in the natural environment (Reis, Gable, & Shelly, 2000).

In the present study, the methodology employed was developed by Moskowitz (1994) to assess stable interpersonal traits across a variety of naturally occurring social situations. Event-contingent recording directly monitors interpersonal behaviours, as well as affect, during social interactions occurring over a period of several days across different social settings. It therefore becomes possible to determine the types of social situations that elicit certain interpersonal behaviours and to assess which behaviours remain stable over time (Brown and Moskowitz, 1998).

Interpersonal behaviours are measured along two independent axes of behaviour. One axis, labeled "status," encompasses submissive and dominant behaviours. Dominant behaviours include telling people what to do or voicing strong opinions; whereas, submissive behaviors entail letting others make decisions or not expressing feelings. The second axis, labeled "affiliation," includes quarrelsome and agreeable behaviours. Quarrelsome behaviours involve ignoring other peoples' comments or confronting other people. Agreeable behaviours include listening attentively to others or expressing affection. These behaviours are based on the interpersonal circumplex (Moskowitz, 1994; see Figure 1) denoting dominance as the opposite of submissiveness and quarrelsomeness as the opposite of agreeableness. The two axes are independent of one another, which imply that an individual's behaviour on one dimension does not

Figure 1

The Interpersonal Circumplex
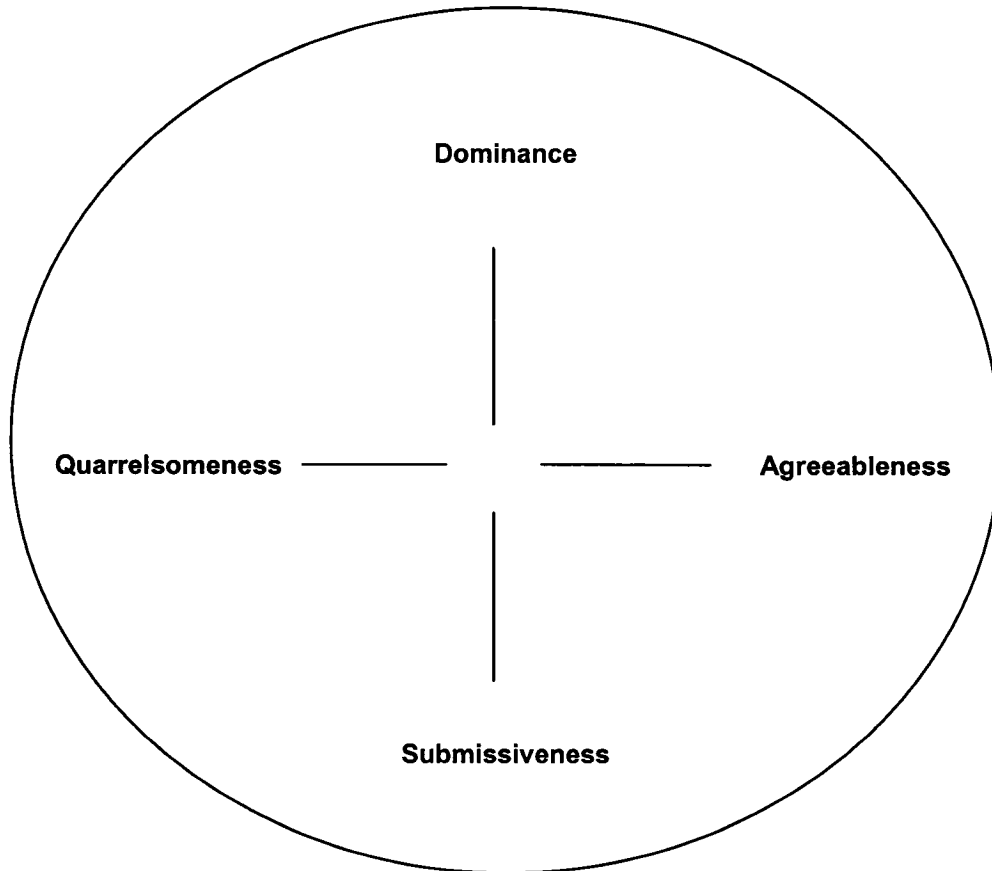
The interpersonal circumplex of behaviour as illustrated in Moskowitz (1994).

necessarily predict his/her behaviour on the other. For example, an individual can be either submissive and quarrelsome or submissive and agreeable.

It is important to highlight that these two axes of behaviour do not incorporate all forms of interpersonal behaviour. For the purposes of the study, we measured impulsiveness independently of these two axes. Impulsiveness represents a risk factor for various externalizing problems, including those associated with conduct disorder and substance abuse (Tremblay, Pihl, Vitaro, &Dobkins, 1994; Schall, Weede, Maltzman, & Irving, 1991). Impulsiveness has been shown to be prominent in manic episodes and appears to be strongly related to BD (Swann, Anderson, Doughtery, and Moeller, 2001). As such, we surmise that impulsiveness might also be implicated in the etiology of mood disorders. However, it has yet to be examined in populations at high risk for BD.

In general, we expected the adolescents of parents with BD to display more maladaptive patterns of interpersonal behaviour than the control participants. More specifically, on the affiliation axis, we expected the offspring of parents with BD to display significantly higher mean levels of quarrelsome behaviours during social interactions than the offspring of parents without BD. This prediction was founded upon research studies that have identified a higher prevalence of externalizing behaviour problems in populations at high risk for mood disorders than in non-risk populations (Hammen, 1990; Radke-Yarrow, et al., 1992; Zahn Waxler et al., 1984; Zahn Waxler et al., 1988). Because quarrelsome behaviours are characteristic of externalizing behaviours, we speculated that event-contingent recording data would show higher levels of quarrelsome behaviours among offspring of parents with BD, than among the control participants. In addition, externalizing behaviour problems were also assessed via the

Achenbach Youth Self-Report form (YSR). We predicted that the adolescents of parents with BD in comparison to the control participants, would report significantly higher scores on the externalizing problems scale of the YSR.

On the status axis, we expected the adolescents of parents with BD to display significantly higher levels of submissive behaviours than adolescents of parents without BD. The rationale underlying this prediction was based on the premise that offspring of parents with BD are more prone to suffer from internalizing problems, characterized by feelings of depression/anxiety and withdrawal. These emotional states are associated with social skill deficits that are notably manifested in maladaptive patterns of low assertiveness (Youngren & Lewinsohn, 1980). For example, depressed and socially anxious individuals are often perceived as being overly submissive in their interactions with other people (Alden & Phillips, 1990). Moreover, animal research suggests that depression and social submissiveness may be intrinsically related. Important elements of depression can be modeled in rats and mice based on observation of submissive behaviour (Malatynska & Knapp 2005). After being placed in situations of forced competition, rodents that behave submissively begin to display characteristic features of depression such as indifference to reward, hopelessness/helplessness, weight change, locomotor activity change, and lack of energy. Furthermore, they appear more anxious (i.e., agitated) than dominant rodents and release elevated levels of stress hormones. Similar observations have also been made among non-human primates who are low ranking in dominance hierarchies (Sapolksy, 1990; 1991; 2004) Among low ranking baboons, prolonged patterns of submissive behaviour result in reduced accessibility to

natural resources and increased vulnerability to the aggressive displays of others, which appear to induce depressive symptoms and undue stress (Sapolsky, 1990; 1991; 2004).

Similar processes may also be occurring in humans. Individuals who behave submissively tend to view themselves as inferior to others and are more inclined to back down in situations of conflict (Gilbert & Allan, 1994). As a result, they have a tendency to inhibit self-promotion, rendering them less able to gain what they desire. In addition, submissive individuals are more susceptible of being disliked, bullied, and rejected by other people (O'Conner, Berry, Weiss & Gilbert, 2002). In short, submissive individuals assume an inferior social rank relative to others, which implies that they have less control over their environment and are more likely to be victimized by others. Consequently, it is possible that social submissiveness engenders negative circumstances that result in depressed mood and/or anxiety. However, it is equally plausible that depressed mood/ anxiety generate feelings of inferiority that induce submissive behaviours. We argue that a bi-directional relationship transpires between depressed mood/anxiety and submissive behaviour. As a result, individuals who behave submissively reinforce these negative mood states and vice versa.

Because adolescents are particularly sensitive to their social rank relative to their peers, submissive behaviour appears to be strongly related to depressed mood states in this age group (Irons & Gilbert 2004). In our own adolescent sample, we expected to find more elevated levels of depressed mood/anxiety states as well as higher mean levels of submissive behaviours among the offspring of parents with BD than the control participants. We assessed depressed mood via the Beck Depression Inventory or Child

Depression Inventory (depending on age of participant) and anxiety using the adult or child version of the Penn State Worry Questionnaire.

Furthermore, to complement measures of interpersonal functioning, groups were compared on measures of behavioural functioning and personality. It was expected that the adolescents of parents with BD, in comparison with the control group, would report more internalizing and externalizing problems on the Achenbach Youth Self-Report Form. It was also expected that the adolescents of parents with BD would report significantly higher scores on the delinquency and psychoticism scales of the Eysenck personality questionnaire and significantly lower scores on the extraversion scale.

Methods

Participants

Twenty-nine offspring of parents with BD ("high risk" group) and 35 offspring of parents with NMD ("low risk group") were randomly selected from a subject pool of 189 15-25 year old offspring involved in a longitudinal project (Ellenbogen and Hodgins, 2004). Parents with BD and their spouses were originally recruited from general hospitals and consumer groups in Quebec. Parents with no mental disorder were selected from the same geographical regions as parents with BD. In order to confirm parental diagnosis (or absence of), parents were administered the Structured Clinical Interview for the DSM-III-R by PhD level clinical psychologists, and their psychiatric records were examined to confirm the presence of diagnoses. Four high risk offspring and 10 low risk offspring refused to participate in the study. Two participants in the low risk group agreed to participate but failed to comply with the instructions provided. Participants who completed event-contingent recording data consisted of 25 (11males/14 females) high risk offspring and 23 (12 males/11 females) low risk offspring.

All participants were administered the Structured Clinical Interview for DSM IV (First et al., 1997). Eight high risk participants (5 males/3 females) received a diagnosis. Of the males meeting diagnostic criteria, two were diagnosed with Bipolar I disorder, one with Bipolar II disorder, one with panic disorder and one with substance use disorder. Of the females meeting diagnostic criteria, two were diagnosed with major depressive disorder and one met diagnostic criteria for specific phobia, substance abuse disorder, and major depressive disorder. In the low risk group, 3 participants (all male) received a diagnosis: 2 with major depressive disorder, and 1 with substance abuse disorder.

The three participants diagnosed with BD were excluded from all data analyses, because of the potential negative influence of manic or psychotic symptoms on social interactions. The final sample consisted of 22 (8 males/14 females) high risk offspring and 23 (12 males/11 females) low risk offspring. The mean age of participation was 18.5 (SD = .50) in both groups.

Measures

Beck Depression Inventory (BDI)

The BDI contains 21 items, selected to represent symptoms of major depression. The items are presented in multiple choice format and scores range from 0-2, indicating the degree of severity of each symptom. The sum of all the items indicates severity of depression. Internal consistency for the BDI ranges from .73 to .92 with a mean of .86. (Beck, Steer, and Garbin, 1988). Studies on the concurrent validity of the BDI have reported moderate to high coefficients with mean coefficients ranging from .58 to .79 (Richter, Werner, Heerlein, Kraus, and Sauer, 1998).

Child Depression Inventory (CDI)

The CDI (Kovacs, 1985) contains 26 items that are rated in the same way as in the BDI. A higher overall score also indicates greater severity of depression. The internal consistency ranges from .71 to .89 and the test-retest coefficients range from .74 to .83 (time interval two to three weeks).

Penn State Worry Questionnaire (PSWQ)

The PSWQ was developed to assess worry via a factor analysis of 161 items relevant to the construct of worry (Meyer, Miller, Metzger, & Borkovec, 1990). A total of

16 items were retained on the questionnaire. The internal consistency among the items is high with a coefficient α of .93. The PSWQ correlates well with other measures related to worry and is able discriminate between individuals suffering from generalized anxiety disorder (characterized by excessive worrying) from those suffering from post-traumatic stress disorder (Meyer, Miller, Metzger and Borkovec, 1990).

Penn State Worry Questionnaire for Children (PSWQ-C)

The PSWQ-C is a questionnaire that is based on the PSWQ but adapted to measure worry in children ranging in age from 6 to 18. The items are basically the same as the PSWQ except that they are re-worded at a grade 2 level. Of the 16 items originally included on the PSWQ-C, two were eliminated because they yielded low internal consistencies in child samples. The alpha coefficients for the remainder of the 14 items were .81 for children aged 6- 11 and .90 for children aged 12-18. The PSWQ-C for children has shown good test - retest reliability and has been well validated (see Chorpita et al., 1997).

Eysenck Personality Questionnaire (EPQ)

The EPQ assesses personality along five scales: Impulsivity, Delinquency, Psychoticism, Extraversion, and Neurtocism. It contains 101 true or false items scored as either 0 or 1. The internal consistencies of the items range from .50 to .82 (Loo, 1979).

Achenbach Youth Self-Report Form (YSR)

The YSR is derived from the Child Behaviour Checklist (CBCL) (Achenbach, 1983). It is designed for adolescents between the ages of 12 and 18 and is completed by himself/herself directly, unlike the CBCL which allows for parents, teachers, and clinicians to rate the behaviours of children. The adolescent selects responses on a three point scale ranging from 0 representing not true to 2 representing very true. The 112 item

questionnaire comprises 8 subscales: aggressive behaviours, delinquent behaviours, somatic complaints, anxious/depressed, withdrawn problems, attention problems, social problems, and thought problems. From these subscales are derived two broadband dimensions (externalizing problems and internalizing problems) and a total problems scale. The externalizing problems scale is composed of the aggressive behaviour and delinquent behaviour subscales. The internalizing problems scale is composed of the anxious/depressed, somatic complaints, and withdrawn subscales. The total problems scale is composed of both the externalizing problems scale and the internalizing problems scale. Scores on the scales of the YSR are reported in the form of T Scores. The mean T score is 50 with a standard deviation of 10. Scores of 70 and above are considered to be clinically significant. Achenbach (1991) reported internal consistencies for the scale ranging between $\alpha.68$ for social problems, α .89 for externalizing problems and α .91 for internalizing problems.

Event Contingent Recording

Event-contingent recording entails asking participants to record interpersonal behaviours and affect during social interactions occurring throughout the day on event-contingent forms provided to them (see Appendix A). An advantage of this technique is that it is not subject to the retrospective biases associated with self-report questionnaires (Reis, Gable, & Shelly 2000). Event-contingent forms require participants to provide information about specific social interactions immediately after each interaction occurs, including the length of the interaction, the date it occurred, and where it occurred (home, school, work, recreation or other). They also needed to provide information about the

person they interacted with by specifying if was a male or female and the nature of their relationship with that person (supervisor, co-worker, supervisee, casual acquaintance, friend, romantic partner, parent, sibling, or other). When the interaction occurred among 2 or more people, participants also noted who was present during the interaction. Moreover, if alcohol had been consumed within 3 hours of the interaction, participants were asked to write down the number of alcoholic beverages ingested.

Both positive and negative affect were measured during social interactions. Negative affect was measured through ratings of the following adjectives: "angry/hostile", "sad", and "worried". Positive affect was assessed through rating of adjectives "happy", "joyous", and "content". Adjectives were rated on a severn point likert scale with 0 representing "not at all" and 6 representing "extremely."

Interpersonal behaviours were rated by asking participants to identify, from a number of items, specific behaviours that they performed during each reported interaction. Participants were told to endorse as many or as few items that applied to them. Four different forms, containing different items, were employed in the study and administered on alternating days to minimize response biases. The original item pool contained 46 items with a breakdown of 12 dominant items, 12 submissive items, 11 quarrelsome items, and 11 agreeable items. An additional 4 items, selected from the Barratt Impulsiveness Scale, were added to measure impulsiveness (Barratt, & Patton, 1983). The items from each of the 5 scales were distributed evenly across each of the 4 forms leaving a total of either 12 or 13 items on each individual form.

Participants were requested to complete a minimum of 4 forms up to a maximum of 10 forms per day over a consecutive period of 14 days. They were told to report on

social interactions occurring over the entire course of the day and not just at one point in time. In this manner, we could obtain a representative sample of social interactions occurring at different points in time during those two weeks. Event-contingent forms were contained within 3 individually coloured booklets that were compact enough to be conveniently carried. Booklet 1 contained forms for the first 4 days, booklet 2 for the next 5, and booklet 3 for the remaining 5 days.

Procedure

Participants were contacted by telephone and were scheduled for a laboratory visit. If the participant was under the age of 18, a parent was first contacted for consent. Following informed consent,.participants were trained to rate social interactions using event-contingent recording procedures. They were provided with the three booklets containing the event-contingent forms as well as detailed written instructions of the procedures they were to follow. They were also provided with a pre-paid envelope and were asked to mail back their first booklet, after completion, to ascertain that they were carrying out the instructions properly.

Participants then underwent a diagnostic interview by an experienced clinician and filled out self-report questionnaires. Participants under age 18 completed the (YSR), the EPQ, the CDI, and the PSWQ-C. Participants 18 and over completed the same questionnaires with two exceptions: they completed the BDI instead of the CDI and the adult rather than child version of the PSWQ.

Participants began to fill out the event-contingent forms on the day following their laboratory visit. At the end of the two weeks, a laboratory member picked up the

remaining two booklets from their homes and remunerated them one hundred dollars for their participation.

Data Analysis

Interpersonal behaviours were distributed along five scales corresponding to the five behavioural dimensions. For every specified event, scores on each scale were computed. Scale scores were calculated by dividing the number of items endorsed on a particular scale by the total number of items that could have been endorsed on that scale. However, Moskowitz (1994) has contended that individuals vary in their rate of responding with some participants generally checking off more items than others. Ipsatized scores were therefore calculated to adjust for these individual differences in rates of checking. An ipsatized mean was initially computed by dividing the mean of the number of items endorsed between 0 and 12 from the total number of items (N=12). An ipsatized score was then computed by subtracting the ipsatized mean from each scale score. Thus, an ipsatized behaviour score reflects the frequency with which behaviours corresponding to the behavioural dimension are endorsed adjusted for by participants' general rate of behaviour (Moskowitz, 2001). Once the ipsatized scores were calculated, the event contingent recording data was analyzed using multi-level modeling.

Event Contingent Recording Data

Social interactions revealing that alcohol had been consumed within one hour of the interaction were excluded. Including data with alcohol consumption would have increased the variability of the data and possibly confounded the results. Event-

contingent recording data was organized at more than one level and therefore was analyzed using multi-level modeling. Other traditional methods such as ANOVA could not be employed because the number of social interactions reported varied across participants. In multi-level modeling, participants are not obligated to have an equal number of cases because models are evaluated using maximum likelihood estimation rather than least squares estimation. Multi-level modeling also differs from ANOVA because it evaluates both fixed effects and random effects at each level of analysis. Random effects are evaluated by allowing regression coefficients (the intercepts and predictor slopes) to vary across groups (higher level units). The variability is modeled by treating intercepts and slopes as the dependent variable in the next level of analysis.

In our study, multi-level analyses were conducted using version Proc Mixed 6.12 of SAS (SAS institute, 1997). The data was structured in such a way that interpersonal behaviours measured across days were nested within individuals, nested within families. In the first model, individual growth curve trajectories were computed to assess variability in interpersonal behaviours across 14 days. In the second model, group membership (high risk vs. low risk) was entered as a first level predictor. In other words, we wanted to see if having a parent with BD versus having a parent with NMD would account for a significant amount of variability in both the intercepts and slopes of interpersonal behaviours across days. In the third and final model, age and sex were entered as second level predictors of interpersonal behaviours. Cross-level interactions were then examined to determine if sex and age moderated the relationship between group and mean levels of interpersonal behaviour. The same analysis was repeated by replacing interpersonal behaviours with affect as the dependent variable. Both positive

and negative affect were measured during social interactions and were included as a dependent variable in the analyses. For all statistical analyses, alpha levels were set at .05 and the Tukey-Kramer method was used to adjust p values for the multiple numbers of comparisons.

Because our primary interest was to determine if there were group differences in interpersonal behaviours during social interactions, we needed to statistically control for extraneous factors that could have altered the way both groups behaved during their social interactions. For example, interacting with family members might elicit behaviours that are different from interacting with peers. In addition, behaviours might also vary depending on the gender of the person(s) interacting with (same-sex or opposite sex), the location where the social interaction occurs, and the time of day it takes place. A chi-square analysis was conducted to determine if both groups engaged in similar types of social interactions across the 14 days. Results (see Table 1) demonstrated that the high risk group reported significantly fewer interactions away from home ($\chi^2 = (1, N= 45) = 10, p = .00$) and away from family ($\chi^2 = (1, N= 45) = 3.9, p = .00$) than the low risk group. The high risk group also reported significantly fewer social interactions with males ($\chi^2 = (1, N= 45) = 30, p = .00$) and significantly more interactions with females ($\chi^2 = (1, N= 45) = 30, p = .00$) than the low risk group. No other group differences were found (see Table 1). Extraneous variables that did differ significantly between groups were entered as covariates in the multi-level model to ascertain that they were not accounting for a significant amount of the variability in our results.

Questionnaire Data

All questionnaire data were analyzed using SPSS 12.0.1. Missing cases, on any given scale, were replaced by the mean of that scale unless more than 2 cases were missing. On questionnaires containing more than one scale, data was discarded completely if more than 2 cases were missing on more than one scale. The depression (BDI/CDI) and anxiety (PSWQ/PSWQ-C) questionnaires were analyzed using a two way between subjects Analysis of Variance (ANOVA). The EPQ and YSR were analyzed using Multivariate Analysis of Variance (MANOVA). Alpha levels were set at .05.

Results

Event Contingent Recording

On the status axis, there was no significant difference between the high risk and low risk group on reported mean levels of dominant behaviours, $t(43) = .86$, ns, or submissive behaviours, $t(43) = .75$, ns, during social interactions. Similar results were obtained on the affiliation axis. The high risk group did not differ significantly from the low risk group on reported mean levels of quarrelsome behaviours ($t(43) = -.07$, ns) or agreeable behaviours ($t(43) = -1.05$) ns, during social interactions. However, the high risk group did display more impulsive behaviours during social interactions than the low risk group, with a group difference approaching statistical significance ($t(43) = -1.88, p = .056$; See Table 2 for descriptives). Analyses of ratings of affect during social interactions revealed that there was no significant group difference in mean levels of positive affect ($t(43) = .76$, ns) or negative affect ($t(43) = .03$, ns) during social interactions.

The effects of gender and age were then examined while controlling for mean levels of impulsivity. There was no significant difference between males and females in reported mean levels of interpersonal behaviours or affect. Group by gender interactions, on the affiliation axis, revealed that the high risk males displayed significantly more quarrelsome behaviours during social interactions than the three other groups ($F = 7.49, p < .05$; see Figure 2) There was also a trend for the high risk males to display lower mean levels of agreeable behaviours during social interactions than the three other groups ($F(1, 42) = 3.34, p = .07$). However, on the status axis, there were no significant group by gender interactions on mean levels of either submissive behaviours ($F(1,42) = .13$, ns) or dominant behaviours ($F(1,42) = .11$, ns). There were no significant group by gender

interactions on mean levels of positive affect ($F(1, 42) = .07$, ns) or negative affect ($F(1,42) = .03$, ns). Age did not predict mean levels of interpersonal behaviours, or mean levels of affect, during social interactions. Moreover, there were no significant group by age interactions on mean levels of interpersonal behaviours or on mean levels of affect.

In short, adolescent offspring of parents with BD had a tendency to exhibit more impulsive behaviours during social interactions, than their control counterparts. Counter to expectation, both groups displayed similar levels of submissive behaviours during social interactions. In partial agreement with our hypothesis, high risk males displayed significantly higher mean levels of quarrelsome behaviours than high risk females or control participants. Furthermore, participants in both groups behaved in a comparable manner regardless of age.

Behavioral problems, depression and anxiety

In order to examine levels of depression in the entire sample of participants, scores on the CDI and BDI were converted into z- scores with the aim of creating a single measure of depression. A one-way ANOVA revealed that the high risk and low risk groups did not differ significantly from one another ($F(1, 45) = .25$, ns). A two-way ANOVA demonstrated that there was no significant gender difference ($F(1, 45) = .02$, ns) or group by gender interaction ($F(1, 45) = 2.6, p = .ns$) on depression scores.

Data on the PSWQ and PSWQ-C were also converted into z-scores prior to statistical analyses. A one-way ANOVA demonstrated that reported levels of worry did not vary significantly between groups ($F(1, 45) = .40$, ns) or between genders ($F(1,45) =$

.56, ns). A two-way between subjects ANOVA revealed that There was no group by gender interaction on levels of reported worry ($F(1, 45) = .53$, ns).

On the YSR, a total of 3 participants had to be excluded from the statistical analyses, as a result of missing data. The remaining sample size included 22 participants in the high risk group (8 males/14 females) and 20 participants in the low risk group (9 males / 11 females).Log-transformed data were analyzed with a MANOVA. Results showed that the high risk group reported significantly more Externalizing Problems ($F(1, 42) = 6.63, p = .01$) than the low risk group. Not surprisingly, they reported significantly more aggressive behaviours ($F(1, 42) = 4.27, p = .04$) and delinquent behaviours ($F(1, 42) = 7.08, p = .01$) than the low risk group. Contrary to our hypothesis, the high risk group did not report more internalizing problems than the low risk group ($F(1,42) = .34$, ns; see Descriptive data reported in T scores in Table 4). There were no significant differences between males and females in reported internalizing problems ($F(1,42) = .38$, ns) or externalizing problems ($F(1,42) = .14$, ns). There were no group by gender interactions in reported internalizing problems ($F(1,42) = .00$, ns) or externalizing problems ($F(1,42) = .13$, ns).

In contrast to our hypotheses, the offspring of parents with BD reported similar levels of depression and anxiety on the depression inventories and worry questionnaires than the control participants. In accordance with expectation, the high risk group reported more externalizing problems than the low risk group on the YSR. However, counter to hypothesis, both groups reported comparable numbers internalizing problems. No group by gender interactions were obtained on these measures.

Personality

A group by gender MANOVA on the Eysenck Personality Inventory revealed no group differences (see Table 3). Analyses of gender demonstrated that males scored higher on the psychoticism scale than females ($F(1, 45) = 5.95, p = .02$). No other gender differences were obtained. A group by gender interaction revealed that the high risk females reported significantly more impulsiveness than the three other groups ($F(1, 45) = 4.29, p < .05$); see Figure 3). High risk females also tended to report higher neuroticism than the three other groups, although this finding fell short of statistical significance ($F(1, 45) = 3.15, p = .083$). However, it is important to note that the sample size between males ($n = 8$) and females ($n = 12$) was unevenly distributed in the high risk group, which could have potentially confounded the results.

Overall, results on the EPQ conflicted with our hypotheses that adolescents of parents with BD would report higher scores on the psychoticism and delinquency scales and lower scores on the extraversion scale than the control participants.

Discussion

Although several studies have examined the psychosocial functioning of offspring of parents with BD, this is the first study, to our knowledge, that has assessed patterns of interpersonal functioning in the natural environment using event-related recording procedures over 14 days. Interpersonal behaviours were measured along two axes of behaviour: a "status" axis representing dominant and submissive behaviour and an "affiliation" axis representing agreeable and quarrelsome behaviours. Impulsive behaviours were also assessed, but independently of these two axes.

The results of the study generated three main findings. First, we found no significant group differences on the "status" axis of behaviour. The high and low risk groups displayed comparable levels of dominant and submissive behaviours during social interactions. We had posited that the high risk group would display significantly higher mean levels of submissive behaviour during social interactions than the low risk group. This hypothesis was based on the assertion that the high risk group would suffer from more elevated levels of depressed mood/anxiety than the control group. These emotional problems have been associated with patterns of social submissiveness in both animal research (Sapolsky, 1990; 1994; 2004; Malatynska, & Knapp, 2005) and human research (Allan, and Gilbert, 1997; Gilbert, & Allan, 1994; O'Conner, Berry, Weiss, & Gilbert, 2002; Price, Sloman, Gardner, Gilbert, & Rohde, 1994). Counter to our hypothesis, we found no group differences on the depression or anxiety measures (CDI/BDI and PSWQ/PSWQ-C) employed in the study.

Secondly, on the "affiliation" axis, the high risk and low risk groups did not differ on self-reported mean levels of agreeable or quarrelsome behaviours during social

interactions. However, group by gender interactions revealed that high risk males reported significantly higher mean levels of quarrelsome behaviours during social interactions than the three other groups. This result partially supported the hypothesis that high risk offspring would display elevated levels of quarrelsome behaviours during social interactions compared with control participants.

Finally, our findings also indicated that the adolescent offspring of parents with BD were more inclined to behave impulsively during social interactions than adolescent offspring of parents with no mental disorder. Unfortunately, this effect fell just short of the conventional level of statistical significance. Examples of impulsive behaviours endorsed by high risk participants included acting or saying things without thinking during social interactions. The group difference on mean levels of impulsive behaviour was somewhat corroborated by data on the EPQ. Group by gender interactions on the EPQ revealed significantly higher scores, on the impulsivity scale, for the high risk females in comparison to the three other groups.

Although impulsive behaviour has generally been understudied in populations at high risk for BD, Swann, Anderson, Doughtery and Moeller (2002) have posited that it may constitute a measurable feature of the basic physiology of BD. In fact, impulsivity has been shown to be higher in individuals with BD than in control subjects and has been identified as having both stable and state dependent aspects in BD. Coupled with our own findings, this line of research suggests that impulsivity may be a manifestation of a behavioural trait that is prodromal of some forms of BD.

In line with this theory, we contend that impulsivity may be a manifestation of a temperamental trait referred to as behavioural disinhibition, defined as an extreme

tendency to seek out novelty, approach unfamiliar stimuli and display disinhibition of speech and action (Hirshfeld-Becker, et al., 2006). This trait has been regarded as a marker of behavioural and emotional dysregulation and has been associated with externalizing disorders such as oppositional-defiant disorder, attention deficit hyperactivity disorder and conduct disorder. Because externalizing problems often precede the onset of BD, Hirshfeld-Becker et al., (2006) have hypothesized that behavioural disinhibition is a potential prodrome of BD. In their laboratory-based study, they found that the rate of behavioural disinhibition was significantly higher among the offspring of parents with BD than among the offspring of parents without BD. These results suggest that offspring of parents with BD may have difficulty regulating their emotions and behaviours, which could lead them to behave impulsively or, in more extreme cases, to behave disruptively. According to Hirshfeld-Becker, et al. (2006) these behaviours are predisposing factors for the onset of BD.

Our research findings indicate that behavioural disinhibition might be manifested differently among males and females (Keenan and Loeber, 1999). The fact that high risk females reported higher scores on the EPQ impulsivity scale, than high risk males, suggests that they may behave more impulsively in a wider array of situations. This result was discrepant with event-contingent recording data, which produced no group by gender interaction on mean levels of impulsive behaviours during social interactions. It is possible that the discrepancy between event-contingent recording and EPQ data signifies that the EPQ does not provide information that accurately reflects how participants actually behave in the natural environment. On the other hand, the two methods may not be assessing the same construct. The EPQ was designed to measure impulsivity as a

personality trait, whereas event contingent recording was intended to assess impulsive behaviour as a measure of interpersonal functioning and solely in the context of social interactions. Therefore, high risk females possibly have more impulsive personality traits than high risk males. As such, we speculate that high risk females display more pervasive impulsive behaviours than high risk males, but not necessarily during daily social interactions.

Our findings suggest that high risk males are more prone to display quarrelsome behaviours during social interactions than high risk females and control participants. As a result, they have a greater tendency to relate to others with patterns of hostility and aggression. This result is consistent with other studies demonstrating that high risk offspring exhibit maladaptive patterns of aggression/hostility when interacting with others (Hammen, 1990; Radke-Yarrow, et al., 1992; Zahn Waxler et al. 1984; Zahn Waxler et al., 1988).

We posit that high quarrelsomeness during social interactions may indicate problems with the regulation of behaviours and emotions. Dsyregulatory problems have been identified in offspring of parents with BD and have been attributed to deficits in frontal lobe functioning (Meyer et al., 2006). Accordingly, Meyer demonstrated that offspring of parents with BD, in comparison with control participants, were less able to perform cognitive tasks dependent on frontal lobe functioning. Moreover, these deficits in cognitive task performance were associated with the presence of more disruptive behaviours and were predictive of the onset of BD in adulthood. As such, putative deficits in frontal lobe functioning appear to be associated with poor inhibitory control

processes that are potentially implicated in the etiology of externalizing behaviour problems and the development of major affective disorder.

It is uncertain why, in our sample, high risk males were more disposed to display quarrelsome behaviours than high risk females. Data on the YSR revealed that both the high risk males and females reported significantly more externalizing problems than the controls. As such, there was concordance in the high risk males between reported numbers of externalizing problems and reported levels of quarrelsome behaviours during social interactions. However, elevated externalizing behaviours are perhaps not so pervasive among high risk females, given that they did not show increased quarrelsomeness when interacting with others.

The gender differences obtained in the study suggest that behavioural disinhibition is manifested differently among high risk males and females. Adolescent females at high risk for mood disorders may have a greater tendency to behave impulsively whereas males may have a greater tendency to behave aggressively and /or delinquently, in addition to their increased impulsivity. These gender differences are consistent with previous research demonstrating that behavioural disinhibition is more strongly related to delinquent behaviour in males than in females (Colder and Stice, 1998). In accordance with Hirshfeld-Becker et al. (2006), we argue that both impulsive and quarrelsome behaviours are markers for the development of mood disorders.

Our results failed to support the hypothesis that high risk youth would exhibit more submissive behaviours during social interactions that low risk youth. This negative finding may be related to the fact that the groups did not significantly differ on internalizing behaviours, which was unexpected. Data on the YSR revealed similar

numbers of reported internalizing problems across the high and low risk groups. This finding is inconsistent with previous studies demonstrating more internalizing problems in the offspring of parents with BD than offspring of parents without BD (Radke-Yarrow, et al., 1992; Zahn Waxler et al., 1984; Zahn Waxler et al., 1988; Dienes, Chang, Blasey, Adleman, & Steiner, 2002). Research within our own sample has also found higher mean numbers of internalizing problems among high risk offspring than among low risk offspring during childhood and during middle adolescence (Ellenbogen et al in press; Faucher, et al., 2003). Perhaps the small sample size prevented us from detecting group differences in internalizing behaviors. As a result, statistical power may have been insufficient to uncover group differences on measures of depression, anxiety, or internalizing problems.

Alternatively, it is conceivable that group differences were not found because we assessed internalizing problems in late adolescence and early adulthood whereas previous research has assessed internalizing problems during childhood and middle adolescence (Ellenbogen et al., in press; Dienes, Chang, Blasey, Adleman, & Steiner, 2002). Studies in non-risk populations have demonstrated that internalizing problems tend to increase significantly from childhood to adolescence (Dekovic, Buist, & Reitz, 2004). As such, it is possible that the normative rise of internalizing problems in adolescence may have washed out previous group differences. Contrary to prediction, internalizing problems may play a less prominent role than expected in the evolution of mood disorders among offspring of parents with BD. Results of our study demonstrate that externalizing behaviour problems may represent a more important developmental marker for the onset of mood disorders in high risk populations.

The present study has several important limitations. First, although our sample was a random selection of participants involved in a greater longitudinal project, we are unsure to what extent our sample was representative of high risk and low risk offspring, in the general population. Attrition rates within our longitudinal subject pool imply that the individuals who were willing to participate within our study may not be characteristic of those who refused. As such, we are especially concerned that the high risk offspring may have included participants with better coping strategies and enhanced psychosocial functioning compared to high risk offspring in the greater sample population.

Secondly, even though event-contingent recording reduces the retrospective bias associated with self-report questionnaires, it remains a subjective measure intended to assess perceptions of behaviours during naturally occurring social interactions. Therefore, it is uncertain if participants reported behaviours that accurately depicted how they behaved during their social interactions. As a result, it might be useful for this methodology to be corroborated by more objective behavioural measurements.

Thirdly, our data needs to be replicated in a larger sample size. The statistical power of our study may have been too low to detect significant group differences on certain measures. In addition, because the number of male and female participants was low and unevenly distributed across cells, it would be important to verify the accuracy of our results among a larger and more representative sample of participants.

As a final remark, the small sample size limited the power to detect differences among sub-samples within the high risk group, some of whom will carry susceptibility genes for major affective disorders and some of whom will not. It is therefore possible that among the high risk participants, some showed elevated levels of submissiveness

during social interactions and reported a more severely depressed mood than others.

Future studies may benefit from examination of high risk individuals having gene

polymorphisms associated with psychosocial dysfunction and/or depression (van West et

al., 2006).

Conclusion

In conclusion, our study was designed to assess the psychosocial functioning of adolescents at high risk for the development of mood disorders in comparison to control participants. In contrast to previous studies, we assessed psychosocial functioning via patterns of interpersonal behaviours that were naturally occurring during social interactions. Our results demonstrated that adolescent offspring of parents with BD, in comparison with control participants, displayed higher levels of impulsive behaviours during social interactions, although this fell just short of conventional statistical significance. Moreover, group by gender interactions revealed that high risk males exhibited significantly higher levels of quarrelsome behaviours than high risk females and low risk participants.

Our results are interpreted in light of research demonstrating that offspring of parents with BD have poor inhibitory control processes, which lead them to behave with greater disinhibition when interacting with others. Accordingly, behavioural disinhibition has been identified as a marker of emotional and behavioural dysregulation and is associated with externalizing disorders. The results of the present study are consistent with the view that behavioural disinhibition is a putative early premorbid trait in some people who develop BD. Future research in this sample is needed to determine whether problematic impulsive and/or quarrelsome behaviour during social interactions is predictive of the development of major affective disorder, including BD.

Overall, this line of research has important implications for interventions geared to prevent the onset of BD in high risk populations. Offspring of parents with BD might benefit from training programs designed to better help them regulate their emotions and

behaviours in interpersonal situations. If offspring of parents with BD are better adapted

to their social environment, it might reduce their risk for externalizing behaviour

problems and interpersonal dysfunction implicated in the etiology of major affective

disorder.

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Table 1

Mean percentage of types of social interactions the low and high risk groups engaged in

	Low Risk Group ($n = 23$)	High Risk Group ($n = 22$)	
	Mean %	Mean %	χ^2
At home	16	17	.81
Away from home	38	30	10*
With males	27	18	30*
With females	25	29	30
With same-sex	31	29	.62
With opposite sex	21	19	.62
With Peers	23	22	.81
With no Peers	30	24	2.1
With Family Members	14	14	.00
With no Family Members	40	33	10*
Morning	18	15	.92
Afternoon	18	17	.62
Evening	17	16	6.2

* $p < .05$

Table 2

Group means and standard deviations of interpersonal behaviour occurring within 14 days in standardized (Z) units.

Interpersonal Behaviour	Low Risk Group ($n = 23$) Mean (SD)	High Risk Group ($n = 22$) Mean (SD)	F
Dominance	5.15 (5.03)	3.75 (5.83)	.86
Submissiveness	-4.96 (5.05)	-6.28 (6.66)	.75
Agreeableness	11.74 (6.81)	14.33 (9.48)	-1.05
Quarrelsomeness	-11.93 (5.40)	-11.80 (7.89)	-.07
Impulsiveness	3.55 (3.12)	5.35 (3.29)	-1.88 *

* $p < .06$

Table 3

Eysenck Scales mean scores and standard deviations between high and low risk groups

Scale	Low Risk Group ($n = 23$) Mean (SD)	High Risk Group ($n = 22$) Mean (SD)	F
Psychoticism	4.70 (1.14)	4.99 (1.10)	1.81
Delinquency	3.81 (2.71)	4.65 (2.91)	.64
Extraversion	8.19 (2.63)	9.37 (2.30)	2.54
Neuroticism	7.31 (4.47)	7.80 (4.16)	.00
Impulsiveness	12.29 (3.01)	13.79 (3.66)	1.58

Table 4

Youth Self Report Form (YSR) scales mean T scores and standard deviations

	Low Risk Group (n = 23)		High Risk Group (n = 22)		
	Mean (SD)		Mean (SD)		F
Withdrawn	51.84	(12.10)	48.16	(7.75)	.85
Somatic Complaints	50.45	(12.04)	49.30	(8.14)	.32
Anxiety/Depression	49.81	(11.50)	49.27	(7.83)	.10
Delinquent Behav.	45.47	(7.63)	53.52	(10.33)	7.08*
Aggressive Behav.	46.26	(8.33)	52.19	(9.26)	4.27*
Social Problems	48.79	(8.10)	50.25	(11.07)	.10
Thought Problems	47.38	(8.84)	51.63	(10.35)	1.99
Attention Problems	48.41	(50.65)	50.65	(10.96)	.36
Internalizing Scale	50.63	(12.01)	48.80	(7.66)	.40
Externalizing Scale	45.58	(7.76)	52.88	(9.41)	6.63*
Total Scale	47.56	(9.37)	52.22	(10.25)	2.0

* p < .05

Figure 2. Mean Scores and Standard Deviations for high risk females (*n* =14), high risk

males (*n* =8), low risk females (*n* = 11), and low risk males (*n* = 11) on mean levels of
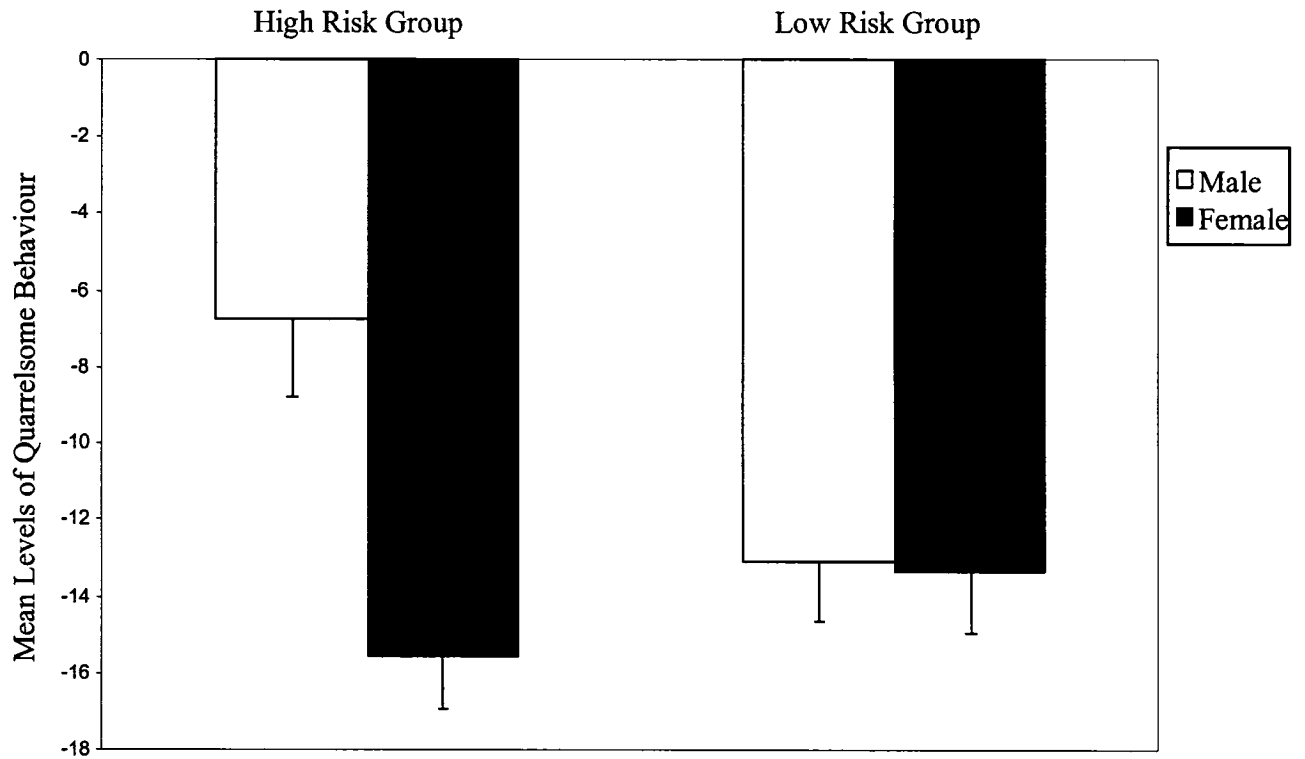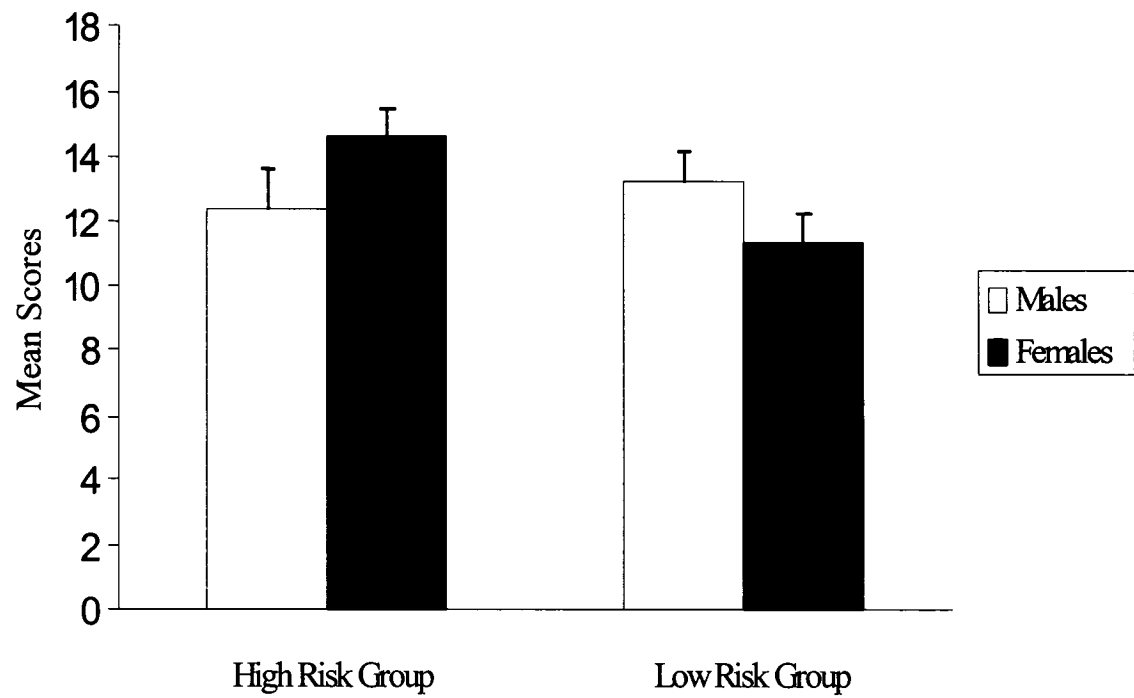
quarrelsome behaviours

Figure 3. Mean Scores and Standard Deviations for high risk females (*n* =14), high risk

males (*n* =8), low risk females (*n* = 11), and low risk males (*n* = 12) on the Eysenck

Impulsivity Scale

Appendix A

Event-Contingent Recording Form

COMPLETEZ CE FORMULAIRE LE PLUS RAPIDEMENT POSSIBLE APRES UNE INTERACTION SOCIALE

À quelle heure l'interaction a-t-elle débutée? ___ : ___ heures   La durée de l'interaction: _____ minutes
Date _____

Décrivez brièvement l'interaction sociale:
_____

À quel endroit l'interaction a-t-elle prie place? ___ maison   ___ travail   ___ récréation   ___ autre

Si de l'alcool a été consommé dans les 3 dernières heures, combien de breuvages alcoolisés ont été consommés? _____

Qui était présent? SVP encerclez tous ceux qui sont valides:

M   F   Superviseur(e)   Collègue de travail   Employé(e)   Connaissance   Ami(e)   Amoureux(se)

Parent   Frère/sœur   Autre

Si plus d'une personne était présente, cochez ici : _____   SVP inscrivez les initiales de la personne principale : _____

Quelles furent vos actions? Remplissez les crochets à côté de chaque action que vous avez fait.

1 J'ai critiqué l'autre (les autres).. [ ]
2 J'ai souri et j'ai ri avec l'autre (les autres)... [ ]
3 J'ai parlé doucement.. [ ]
4 J'ai fait un commentaire sarcastique.. [ ]
5 J'ai exprimé une opinion... [ ]
6 J'ai complimenté l'autre ou en ai fait l'éloge.. [ ]
7 Je n'ai pas exprimé mon désaccord quand je le ressentais...................................... [ ]
8 J'ai fourni de fausses informations.. [ ]
9 J'ai été droit au but.. [ ]
10 J'ai fait des concessions pour éviter une situation désagréable................................ [ ]
11 Je n'ai pas fait valoir mon point de vue... [ ]
12 J'ai dit les choses sans réfléchir.. [ ]

Comment vous sentiez-vous?	Pas du tout						Extrêmement
	0	1	2	3	4	5	6
1 critiqué(e) par l'autre (les autres)............	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
2 inquiet(inquiète) / anxieux(se)................	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
3 heureux(se)......................................	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
4 frustré(e)...	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
5 content(e)..	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
6 en colère / hostile..............................	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
7 en sécurité émotionnellement avec l'autre	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
8 plaisir / amusement.............................	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
9 malheureux(se)...................................	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

10	joyeux(se)..	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
11	déprimé(e) / triste.................................	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
12	bousculé(e) / mené(e) par le bout du nez.	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]