Are Reported Differences in Life Events for Anxious Children and Controls due to Comorbid Disorders?

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Abstract

Many studies have reported that anxious children experience more negative life events than controls. However, studies have not yet addressed the possibility that this difference may be due to comorbidity with non-anxiety disorders. Furthermore, presence of psychopathology may also lead children to act in ways that increases frequency of negative life events and decreases the frequency of positive life events. Mother and child-report versions of a questionnaire measure of life events (CASE) assessed life events in the past 12 months in anxiety-disordered children ($n = 198$), and controls ($n = 88$). Mother reports indicated that anxious children experienced more negative and fewer positive behavior-dependent events than control children. Child reports showed a similar pattern, however significant differences were only present between anxious and control groups on the number of negative behavior-dependent events. Results indicated that anxious-control differences remain irrespective of comorbidity with non-anxiety disorders. However, the highest rates of negative life events were present in children with a comorbid disorder.
There is increasing evidence that anxious children report a greater number of negative life events in comparison to controls (Boer et al., 2002; Eley & Stevenson, 2000). Negative life events have been outlined as a potential contributor to the development and maintenance of child anxiety in theoretical models (Chorpita & Barlow, 1998; Hudson & Rapee, 2004; Rapee, 2001). For the most part, these models appear to assume that life events are independent of the individual’s actions. In contrast, transactional models of stress and life events differentiate between life events that are independent of the child’s behavior (e.g., deaths, natural disasters), or dependent (e.g., peer conflict) and therefore related wholly or at least in part to a child’s behavior (Rudolph et al., 2000). Emotional and/or behavioral problems may lead children to behave in ways that increase the likelihood of negative events (Sandberg, McGuinness, Hillary, & Rutter, 1998). Indeed, studies with community samples of adolescents have found that trait anxiety (Swearingen & Cohen, 1985) and internalizing symptoms (Kim, Conger, Elder, & Lorenz, 2003) predicted negative life events at a later time point, suggesting that anxious/internalizing symptoms may contribute to the occurrence of negative life events.

Previous research investigating the potential causal role of life events confined assessment to independent events for methodological reasons (e.g., Allen, Rapee, & Sandberg, 2008; Eley & Stevenson, 2000; Goodyer, Wright, & Altham, 1990). However, it has been proposed that the occurrence of dependent life events following the inception of disorder may play an important role in the maintenance of psychopathology (Sandberg et al., 1998). That is, occurrence of dependent events experienced during a clinical episode may serve to maintain or even increase symptom severity and interference. The only study to compare number of independent and dependent negative events in a clinical sample of anxious children found that anxiety disordered children (n = 20) did not differ
from controls \(n = 11\) in the total number of mother-reported negative life events, or the number of independent or dependent negative events (Williamson, Birmaher, Dahl, & Ryan, 2005). However, given the small sample size of this study and the important implications a transactional conceptualization of life events may have for theoretical models of child anxiety, this is a promising area that warrants further investigation.

The potential impact of comorbidity on rates of life events experienced by anxious children versus controls is another important issue overlooked by past research. Child anxiety is commonly comorbid with other non-anxiety disorders (Last, Hersen, Kazdin, Orvaschel, & Perrin, 1991), and negative life events have been associated with a range of psychopathology in children (Sandberg et al., 1998; Tiet et al., 2001; Williamson, Birmaher, Al-Shabbout, & Ryan, 1995). Assessment of negative life events in clinically anxious children may therefore be confounded by presence of comorbid non-anxiety disorders. Hence an aim of this paper is to examine the impact of comorbidity by comparing rates of life events in a) anxious children with comorbid non-anxiety disorders and controls, b) anxious children with no comorbid non-anxiety diagnoses and controls.

Finally, this paper will examine the relationship between child anxiety and positive life events. Several studies have demonstrated that anxiety is more strongly associated with negative events than positive events (Boer et al., 2002; Swearingen & Cohen, 1985). However, some evidence suggests that positive life events influence anxiety symptoms in children directly by lessening distress, and/or indirectly by acting as a “buffer” against the impact of negative life events (Garnefski, Kraaij, & Spinhoven, 2001; Shahar & Priel, 2002). Hudson and Rapee suggested that as anxiety is characterized by avoidance and increased perceptions of threat, anxious children may be less likely to initiate positive
experiences (e.g., new friendships, taking up a hobby or sport). To date, only one study has examined the relationship between behavior-dependent positive life events and adjustment, demonstrating a negative association between internalizing symptoms and positive-dependent events according to mothers, but not adolescent reports (Masten, Neemann, & Andenas, 1994). Comorbid disorders may also influence the relationship between child anxiety and positive life events, given reported negative associations between positive events and externalizing and depressive symptoms in adolescents (Masten et al., 1994; Shahar & Priel, 2002).

The objectives of the present study were to compare the number of life events experienced during the preceding 12 months in anxious, comorbid and control children as a function of event dependence and valence. Reports from both mothers and children were utilised to avoid problems associated with single informant reports of symptoms and life events (Rudolph et al., 2000). Moreover, evidence for differences in parent and child report of life events suggest that the differing views of parents and children should be considered (Compas, Howell, Phares, Williams, & Giunta, 1989; Larson & Ham, 1993). While an increase in the number of independent negative life events relative to controls has been demonstrated prior to the onset of anxiety in children (Allen et al., 2008; Goodyer et al., 1990), independent events were not expected to occur at greater rates for anxious children relative to controls during a clinical episode of anxiety. Duration of the current clinical episode was likely to vary across children in the anxious sample, as life events in the current study were assessed in the 12-month period prior to presentation at a treatment clinic, following the onset of their current anxiety diagnosis. In contrast, it was predicted that based on reports from both mothers and children, the anxious group would report more negative behavior-dependent events than the control group. Conversely, the
anxious group were predicted to report significantly fewer positive behavior-dependent events than controls.

Method

Participants

The clinical sample consisted of 198 children and their mothers aged 7 to 17 years recruited through the Macquarie University Anxiety Research Unit, Sydney, Australia. Clinical children were required to meet DSM-IV criteria (APA, 1994) for an anxiety disorder as their primary diagnosis based on a structured clinical interview (see below). Primary diagnoses were as follows: Generalized Anxiety Disorder 49%, Social Phobia 17%, Separation Anxiety Disorder 14%, Specific Phobia 10%, Obsessive-Compulsive Disorder 7%, Panic Disorder 3%, Anxiety Disorder Not Otherwise Specified 1%, Post-Traumatic Stress Disorder 1%. Most children in the clinical sample met criteria for more than one anxiety disorder (84%). Non-anxiety, comorbid diagnoses included externalizing disorders only (n = 30), mood disorder only (n = 25), both mood disorder and an externalizing disorder (n = 5), and “other” diagnoses including enuresis (n = 2), encopresis (n = 1), selective mutism (n = 1) and sleep terror disorder (n = 1).

The control sample consisted of 96 children aged 7 to 16 years recruited through advertisements in school bulletins asking for children who had never seen a mental health professional and their mothers to participate. Control mothers and children received $50 in return for completing the questionnaires, structured clinical interview (see below) and some additional tasks. Control mothers and children were excluded (n = 8) if the child met criteria for any mental disorders, leaving 88 control children and their mothers included in the analyses.
Measures

Children’s diagnostic status was determined using the Anxiety Disorders Interview Schedule: Child and Parent versions for DSM-IV (ADIS-C/P-DSM-IV; Silverman & Albano, 1996). The ADIS-C/P are semi-structured child and parent interviews designed to assess anxiety and common comorbid disorders in children and adolescents. The ADIS-C/P provides clinician-based consensus child diagnoses formed on the basis of both child and parent report of impairment and symptomatology. Primary diagnoses represent the disorder currently causing the most life interference. Secondary diagnoses include all other disorders where DSM-IV criteria are met. Graduate students in clinical psychology conducted all the ADIS-C/P interviews, with both parent and child interviews conducted by the same interviewer. The ADIS-C/P has good to excellent test-retest reliability for combined diagnoses (Silverman, Saavedra, & Pina, 2001) and data from our own clinic has also shown good to excellent inter-rater agreement for child anxiety diagnoses, with kappas ranging from .68 to .93 (Lyneham, Abbott, & Rapee, 2007).

A brief background questionnaire was included to obtain mother report of family structure, ethnicity, household income, and employment. The Spence Child Anxiety Scale: Child and Parent versions are 38-item scales designed to assess anxiety symptoms in children and adolescents (SCAS-C/P; Spence, 1998; Nauta et al., 2004). The SCAS consists of six subscales designed to mirror diagnostic categories in the DSM or summed to yield a total score. SCAS-C has strong psychometric properties (α = .92; 6-month test-retest = 0.60) and correlates well with other measures of anxiety (Spence, 1998). The parent version of the SCAS also shows satisfactory to excellent reliability and acceptable validity (Nauta et al., 2004). In the current sample alphas for SCAS-C and SCAS-P were
.90 and .94, respectively. The Strengths and Difficulties Questionnaire is a 25-item rating scale with both parent and child versions (SDQ-C/P; Goodman, 1997). The SDQ assesses emotional symptoms, conduct problems, hyperactivity and peer problems in children. The SDQ has satisfactory reliability and validity (Goodman, 2001). In the current sample, alphas were .89 for the SDQ-P and .84 for the SDQ-C total difficulties scores.

Mothers and children completed the Child and Adolescent Survey of Experiences (CASE-C/P; Allen, Rapee, & Sandberg, in preparation). This questionnaire requires respondents to indicate whether 38 listed life events have occurred in the previous 12 months. Respondents are required to rate reported events as either good or bad. CASE items were derived from PACE (Sandberg et al., 1993), an interview measure of childhood experiences that covers a similar range of events: moves, parental pregnancy/birth of a sibling, marital events, parent employment events, people entering/leaving household, separations from family, deaths and illnesses, family and peer relationships, witnessing an upsetting event (e.g., car accident), school events, home burglary, loss of/harm to pet, and significant achievements. Following PACE guidelines, life events were operationally defined as experiences that most children would find either: a) threatening, unpleasant or upsetting, or b) very pleasant, enhancing to self-esteem, or opening up new opportunities. Moderate one-week test-retest reliability has been shown for the total number of mother and child reported life events, \( r_s = .75, .75 \), (Allen et al., in preparation). Two-tailed Pearson correlation coefficients revealed significant positive relationships between mother report of negative and positive life events on CASE and PACE (\( r_s = .47, .28 \); respectively). Significant positive relationships have been shown between the number of mother-reported negative life events and child and mother SDQ scores (\( r_s = .38, .35 \)), and child and mother SCAS scores (\( r_s = .25, .36 \)) in a community sample (N = 79). The
The number of child-reported negative life events was significantly related to child-reported SDQ ($r = .38$) but not mother-reported SDQ scores ($r = .08$).

All CASE items were classified as being most likely independent of or dependent on the child’s behavior according to the consensus judgement of the two authors of this paper (cf. Williamson et al., 1995, 2005). Events were judged as independent if they were considered highly unlikely to be related to the child’s behavior (e.g., moving house), or dependent if they were considered highly likely to be directly related to the child’s behavior (e.g., significant achievement). The decision as to whether a life event was independent, dependent, or unclassifiable on this dimension was guided by past research where life events listed on checklists were categorized as independent of or dependent on child behavior (Masten et al., 1994; Williamson et al., 1995, 2005). Thus, life events related to death, accidents or illness, individuals entering or leaving the home, being a victim of crime or focused on parents (loss of/new employment, parental separation or new relationship, pregnancy or birth) were classified as independent of the child’s behavior. Events related to academic failure or success at school, conflict with family members or others, achievements and the beginning or end of a friendship or other close relationship were considered likely to be related to the child’s behavior. The consensus judgement process resulted in 14 items classified as behavior-dependent and 20 as independent. Four items were excluded as they were judged as to be ambiguous with respect to dependence: being teased/bullied, change of school, child injury, and child absence from home. As a further check on the validity of item categorization, four independent raters who were graduate students in Psychology were asked to categorize CASE items as independent or dependent, excluding the aforementioned excluded items. Fleiss’ kappa indicated excellent agreement at .90 (Randolph, 2008). Raters disagreed
with the consensus of the present study authors on only three items: child went on a special holiday \((n = 2)\), child saw something bad happen \((n = 1)\), and child attained a position of special responsibility \((n = 1)\). The original categorizations of these items were retained to remain consistent with past research.

The following scores were derived from mother and child versions of CASE: number of events rated as positive (“good”) and negative (“bad”), positive and negative events most likely independent of the child’s behavior (positive-independent, negative-independent), and dependent on the child’s behavior (positive-dependent, negative-dependent). Seven mothers (Anxious: \(n = 4\); Comorbid: \(n = 3\)) and twenty children (Anxious: \(n = 9\); Comorbid: \(n = 11\)) did not complete CASE-C/P and were excluded from relevant analyses.

**Procedure**

After obtaining their informed consent, mothers and children were mailed the abovementioned questionnaires one week before attending their ADIS-C/P interview. Completed questionnaires were returned at the time of assessment.

**Results**

**Demographics**

Most children came from two-parent families (83%), while examination of household income revealed a predominantly middle to upper class sample (see table 1). All mothers were the child’s primary caregiver. Mothers identified their family’s ethnicity as follows: 86% Australian, 6% European, 5% Asian, and less than 1% Lebanese, South African and Mauritian. Groups were compared on demographic measures using chi-squares and two-
tailed between-subjects analysis of variance (ANOVA) with Bonferroni adjustments for post-hoc comparisons. There is some variability in participant $n$ given that a few mothers failed to complete some specific demographic items (ethnicity: 8 mothers; income: 4 mothers; employment: 6 mothers). Given three post hoc, between group comparisons, critical alpha was set at $p = .017$. Anxious children were slightly younger than comorbid children, $t(281) = 3.230, p = .004$; and controls, $t(281) = 3.800, p = .001$. Comorbid children and controls did not differ significantly in age, $t(281) = .121, p > .017$. Groups differed significantly on household income, as a greater percentage of the two clinical groups reported an annual income in the lower brackets and a smaller percentage reported incomes in the higher brackets than controls. Groups did not differ significantly on any other demographic measure. Child age and household income were included as covariates in later analyses given their known association with the number of life events experienced by children (Dohrenwend et al., 1998).
Table 1

Demographic characteristics

<table>
<thead>
<tr>
<th></th>
<th>Anxious</th>
<th>Comorbid</th>
<th>Control</th>
<th>Statistic</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n = 133</td>
<td>n = 65</td>
<td>n = 88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>9.97</td>
<td>11.12</td>
<td>11.28</td>
<td>F 8.831</td>
<td>p &lt; .001</td>
</tr>
<tr>
<td>Gender: male/female</td>
<td>79/54</td>
<td>31/34</td>
<td>44/44</td>
<td>χ² 3.164</td>
<td>NS</td>
</tr>
<tr>
<td>Ethnicity % (n)</td>
<td></td>
<td></td>
<td></td>
<td>χ² .156</td>
<td>NS</td>
</tr>
<tr>
<td>Australian</td>
<td>86 (110)</td>
<td>85.5 (53)</td>
<td>87.5 (77)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family structure % (n)</td>
<td></td>
<td></td>
<td></td>
<td>χ² 4.138</td>
<td>NS</td>
</tr>
<tr>
<td>Two-parent</td>
<td>84 (112)</td>
<td>77 (50)</td>
<td>85 (75)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single parent</td>
<td>10 (13)</td>
<td>9 (6)</td>
<td>7 (6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blended family</td>
<td>6 (8)</td>
<td>14 (9)</td>
<td>8 (7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household where at least one parent employed % (n)</td>
<td>98.5 (130)</td>
<td>100 (60)</td>
<td>99 (87)</td>
<td>χ² .899</td>
<td>NS</td>
</tr>
<tr>
<td>Household income % (n)</td>
<td></td>
<td></td>
<td></td>
<td>χ² 18.882</td>
<td>p = .004</td>
</tr>
<tr>
<td>$1-$20,000</td>
<td>7 (9)</td>
<td>6 (4)</td>
<td>1 (1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$20,001-$40,000</td>
<td>14 (19)</td>
<td>23 (15)</td>
<td>3 (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$40,001-$80,000</td>
<td>37 (49)</td>
<td>39 (25)</td>
<td>45 (38)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;$80,000</td>
<td>42 (56)</td>
<td>31 (20)</td>
<td>51 (43)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: NS = not significant

Group Differences on Clinical Measures

Two-tailed between-subjects ANOVAs revealed significant differences between groups on both mother report of child anxiety, $F(2,284) = 154.04$, $p < .001$; and child self-reported anxiety, $F(2,280) = 73.47$, $p < .001$ (Table 2). Bonferroni adjusted post-hoc comparisons showed that comorbid children reported greater symptomatology on the SCAS-P, but not SCAS-C compared to anxious children. Controls reported fewer symptoms on the SCAS-P and SCAS-C than anxious and comorbid children. Groups also differed on both mother and child self-report versions of the SDQ. Greater symptomatology was reported by the comorbid group on both the SDQ-P and SDQ-C.
compared to anxious children. In turn, greater symptomatology was reported for anxious children on the SDQ-P and SDQ-C compared to controls.

Table 2

*Group Differences on Clinical Measures*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Anxious M ± SD</th>
<th>Comorbid M ± SD</th>
<th>Control M ± SD</th>
<th>t</th>
<th>Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCAS-P</td>
<td>33.1 ± 14.3</td>
<td>40.1 ± 14.8</td>
<td>8.0 ± 5.8</td>
<td>14.665</td>
<td>Control vs. Anxious**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15.430</td>
<td>Control vs. Comorbid**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.617</td>
<td>Anxious vs. Comorbid*</td>
</tr>
<tr>
<td>SCAS-C</td>
<td>34.9 ± 18.3</td>
<td>39.7 ± 19.4</td>
<td>11.9 ± 7.2</td>
<td>10.511</td>
<td>Control vs. Anxious**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10.352</td>
<td>Control vs. Comorbid**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.925</td>
<td>Anxious vs. Comorbid</td>
</tr>
<tr>
<td>SDQ-P</td>
<td>14.6 ± 5.7</td>
<td>20.3 ± 5.8</td>
<td>4.6 ± 3.7</td>
<td>13.712</td>
<td>Control vs. Anxious**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>17.967</td>
<td>Control vs. Comorbid**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7.049</td>
<td>Anxious vs. Comorbid**</td>
</tr>
<tr>
<td>SDQ-C</td>
<td>13.5 ± 5.9</td>
<td>16.7 ± 5.9</td>
<td>7.4 ± 4.7</td>
<td>8.005</td>
<td>Control vs. Anxious**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9.928</td>
<td>Control vs. Comorbid**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.636</td>
<td>Anxious vs. Comorbid*</td>
</tr>
</tbody>
</table>

* p < .01; ** p < .001

*Number and Independence of Life Events*

A 3(Group: Anxious, Comorbid, Control) X 2(Event Valence: Positive, Negative) X 2(Independence: Independent, Dependent) analysis of covariance (ANCOVA) was conducted on the number of mother-reported life events with repeated measures on the last two factors, and with child age and income as covariates. Given the number of factors and the need to conserve space, only main effects and interactions involving group
differences will be reported here. Interested readers can contact the first author for more detailed description of the statistics. The between-subjects main effect for group was not significant, \( F(2,265) = 1.014, \) partial \( \eta^2 = .008, \) \( p = .364. \) There was a significant interaction between group and event valence, \( F(2,265) = 35.982, \) partial \( \eta^2 = .214, \) \( p < .001. \) The interaction between group and independence was not significant, \( F(2,265) = .173, \) partial \( \eta^2 = .001, \) \( p = .841. \) Finally, the three-way interaction between group, independence and event valence was significant, \( F(2,265) = 9.463, \) partial \( \eta^2 = .067, \) \( p < .001. \) Bonferroni adjusted follow-up tests of simple effects examined differences between groups regarding mother-reported positive and negative independent and dependent events (critical alpha \( p < .004). \) There were no significant differences in the number of positive-independent events for controls compared with comorbid or anxious children, \( t(265) = -1.394, p = .165; t(265) = -1.470, p = .144; \) respectively. There was also no significant difference in the number of positive-independent events reported by mothers of children in the anxious and comorbid groups, \( t(265) = .196, p = .847. \) In contrast, more positive-dependent events were reported by mothers of controls in comparison to mothers of anxious and comorbid children, \( t(265) = 4.282, p < .001; t(265)= 5.667, p < .001, \) respectively. Although mothers of comorbid children reported slightly fewer positive-dependent events than mothers of anxious children, this difference was not significant, \( t(265) = 2.308, p = .022. \)

Mothers of control children did not differ significantly on the number of negative-independent events they reported relative to mothers of anxious children, \( t(265) = .695, p = .488; \) and comorbid children, \( t(265) = 2.206, p = .028. \) Likewise, mothers of anxious children did not report a significantly different number of negative-independent events to mothers of comorbid children, \( t(265) = 1.753, p = .080. \) In contrast, mothers of controls
reported fewer negative-dependent events than mothers of anxious children, \(t(265) = 3.376, p = .001\); and comorbid children, \(t(265) = 6.740, p < .001\). Furthermore, mothers of comorbid children reported more negative-dependent events than mothers of anxious children, \(t(270) = 4.253, p < .001\). Table 3 presents adjusted means and standard errors of the number of mother-reported positive and negative independent and dependent events.

Table 3

<table>
<thead>
<tr>
<th></th>
<th>Mother Report</th>
<th>Child Report</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Anxious</td>
<td>Comorbid</td>
</tr>
<tr>
<td></td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td>Independent</td>
<td>1.22 (.10)</td>
<td>1.61 (.13)</td>
</tr>
<tr>
<td>Dependent</td>
<td>2.29 (.11)</td>
<td>1.10 (.10)</td>
</tr>
</tbody>
</table>

A second ANCOVA identical in structure to the first was conducted to compare the number of life events reported by the children. The between-subjects main effect for group was significant, \(F(2,252) = 5.922\), partial \(\eta^2 = .045\), \(p = .003\). Anxious and control children did not differ significantly in their total number of reported events, \(t(268) = .889\), \(p > .017\), \(Ms = 8.28, 7.60\). However, comorbid children reported a greater number of life events overall (\(M = 9.98\)) than anxious children, \(t(268) = 3.619, p < .001\); and controls,
\(t(268) = 4.119, p < .001\). There was a significant interaction between group and event valence, \(F(2,252) = 19.036\), partial \(\eta^2 = .131\), \(p < .001\). Comorbid children reported more negative events than both control children, \(t(252) = 5.919, p < .001\), \(M_s = 2.47, 1.15\); and anxious children, \(t(252) = 4.211, p < .001\), \(M = 1.59\). Anxious children also reported more negative events than controls, \(t(252) = 2.438, p = .015\). In contrast to negative events, there were no significant differences in the number of positive events reported by control children relative to comorbid and anxious children, \(t(252) = 1.20, p = .232\), \(t(252) = 1.911, p = .057\), respectively; \(M_s = 2.03, 2.10, 2.33\). Similarly, there was no significant difference in the number of positive events reported by anxious and comorbid children, \(t(252) = .353, p = .724\). The interaction between group and independence was not significant, \(F(2,252) = 2.271\), partial \(\eta^2 = .018\), \(p = .105\). In contrast to mother-report, the three-way interaction between group, independence and event valence was not significant, \(F(2,252) = 1.791\), partial \(\eta^2 = .014\), \(p = .169\), when reported by children. Table 3 presents adjusted means and standard errors of the number of child-reported positive and negative independent and dependent events.

**Power Analysis**

Power was calculated to determine the effect size that was could be reasonably be expected to be detected based on the main analyses that involved three independent variables: group, independence, and valence. Based on an overall sample of 281 participants, the study allowed for reasonable likelihood (power = 0.82) to detect a significant difference given a small to medium effect size of \(f = 0.19\), at alpha = .05 (Faul & Erdfelder, 1992).
Discussion

Consistent with previous research (Boer et al., 2002; Eley & Stevenson, 2000), anxious children experienced significantly more negative events than control children, according to both mothers’ and children’s perspectives. This finding held irrespective of comorbidity, indicating that additional non-anxiety diagnoses disorders do not fully account for the greater frequency of negative life events experienced by anxious children compared to controls. Groups did not differ on negative events that were clearly independent of the child’s behavior, according to either mothers’ or children’s reports. This is not surprising given that the 12-month period prior to presentation at a University-based outpatient clinic following the onset of the anxiety disorder was assessed. While severe independent negative life events have been associated with the onset of clinical episodes of anxiety in children (Allen et al., 2008; Goodyer et al., 1990), there is little reason to expect that anxious children will experience more negative events that are independent of their behavior during a clinical episode.

In contrast to the findings for behavior-independent events, mothers’ reports indicated that anxious children experienced a significantly greater number of negative behavior-dependent events. This appears to be inconsistent with the only previous study in this area (Williamson et al., 2005). However, apparent differences between these results may be attributable to the considerably greater power in the current study. Although children’s reports indicated that both anxious groups experienced more negative behavior-dependent events than controls, this difference was not significant. Interestingly, both mother and child report revealed that comorbid children demonstrated greater symptomatology and more negative events in comparison to anxious children. It is likely that a broad range of
difficulties and greater symptom severity are associated with the increased occurrence of negative events, especially those that are dependent on a child’s own behaviors, consistent with a transactional conceptualization of life events (Rudolph et al., 2000). Present study findings suggest that anxiety disorders in children are associated with an increased frequency of negative life events related to their own behavior, and this association appears to be amplified by comorbid non-anxiety disorders. This increased rate of negative behavior-dependent events could potentially produce a continuous cycle of symptoms and stressors that may serve to maintain the child’s difficulties. Models of anxiety development predict that the susceptibility of anxious children to further anxiety is increased as a result of experiencing negative events, through the formation and reinforcement of cognitive vulnerability (Chorpita & Barlow, 1998; Hudson & Rapee, 2004; Rapee, 2001). In turn, fewer independent negative events may be sufficient to precipitate future episodes of anxiety given this increased vulnerability.

The current findings raise the question of why anxious children experience increased rates of negative behavior-dependent life events. One explanation is that the occurrence of such events is due wholly or in part to anxious behaviors. For example, events could be the product of avoidance (e.g., conflict with a parent who is trying to address the child’s avoidance; procrastination leading to exam failure). Given the cross-sectional nature of the associations reported in the present study it is also possible other factors besides anxiety may be directly responsible for differences between anxious and control children in the rates of behavior-dependent life events. Alternatively, other factors may produce both anxiety symptoms and behavior-dependent events. These factors may pertain to characteristics of the child (e.g., an inherited temperamental vulnerability), their family (e.g., parental modelling of maladaptive behaviors or emotional responses) or to broader
living conditions (e.g., chronic adversity, social environment). Further research examining factors likely to influence rates of behavior-dependent events and incorporating a longitudinal design are needed to clarify the relationship between anxiety in children and behavior-dependent events. To some extent the lack of such research addressing the possibility that anxious children contribute to the maintenance of their difficulties through their own behavior may be due to the absence of guiding theory regarding this matter. The findings of the current study indicate a need for theories to incorporate a transactional conceptualization of life events.

The prediction that anxious children, regardless of comorbidity, would experience significantly fewer behavior-dependent positive events than controls was supported by mother’s reports. Children’s reports showed a similar pattern, although this difference did not reach significance. It appears that anxious children may miss many positive life experiences, especially if they are likely to depend on their own behavior. This appears to be even more the case for anxious children with comorbid non-anxiety disorders. The poverty of positive events may further contribute to an anxious vulnerability by limiting the development of social and coping skills (Lyneham & Rapee, 2004). Positive events may act as a protective factor against anxiety by enhancing a child’s sense of self-efficacy, to the extent that children perceive themselves as responsible for event occurrence. Theoretical models of anxiety may therefore need to include the absence of behavior-dependent positive life events as an additional contributing factor to the maintenance of anxiety.

There are several methodological issues that suggest a cautious interpretation of the current findings. One issue relates to the classification of life events as behavior-
dependent or independent. While the current study adhered to the methods of past research utilizing a checklist measure of life events regarding the process of classification as well as the types of life events classified as independent and dependent (e.g., Masten et al., 1994; Williamson et al., 1995, 2005), the possibility remains that some events may have been classified differently if more detail about the circumstances surrounding these life events had been known. Furthermore, it cannot be determined from this study whether life events considered likely to be related to the child’s behavior were necessarily related to the child’s anxiety symptoms. Assessment of life events using an investigator-based interview would enable more detail about life events and the social context in which they occurred to be gathered, facilitating a more accurate categorization of life events as behavior-dependent or independent and the specific behaviors upon which they depend. However the classification of life events listed on a checklist as independent or dependent in the present study may represent a logical first step before pursuing further inquiry using costly and time-consuming life events interviews. Finally, it should be noted that while children may view themselves as subjectively responsible for life events that were classified as independent of their behavior (e.g., parental divorce), the current study focus was on the objective independence of life events.

Despite the caution needed when interpreting findings related to the relationship between behavior-dependent life events and psychopathology it is important to study such life events for several reasons (Sandberg & Rutter, 2008). First, simply because children may have brought about life events through their own behavior does not mean that they do not produce significant distress or that such experiences do not then influence later behavior or vulnerability to disorder. Furthermore, restricting study to only those life events that are independent of behavior would also result in major sources of stress (e.g., peer...
difficulties) being excluded from life events research (Hammen, 1991). Finally, the
distinction between independent and dependent stressors has been validated by evidence
from genetic research. For example, it has been shown that negative behavior-dependent
life events occurring within an individual’s personal or social network are mildly to
moderately heritable (Kendler, Karkowski, & Prescott, 1999).

No conclusions can be drawn regarding the causal role of life events in the development
of anxiety given the cross-sectional design of the current study. While the current results
provide evidence for an association between behavior-dependent life events and child
anxiety, they cannot determine the direction of effect. That is, whether increased rates of
negative behavior-dependent and fewer positive behavior-dependent life events preceded
or followed the current anxiety diagnosis. It is possible that some life events assessed in
the anxious sample may actually have preceded the current clinical episode, given that
most anxiety disorders require only a 6-month duration of symptoms and impairment to
fulfill diagnostic criteria. Therefore longitudinal research assessing both the onset of
anxiety and the timing of life events is warranted to clarify the direction of influence
between life events and anxiety disorders.

Importantly, this study relied on subjective report of event valence. Anxious children may
be more likely to interpret events as negative due to a temperamental vulnerability
(Hudson & Rapee, 2004; Rapee, 2001). Biases may also be evident in parent report, given
evidence for the familial transmission of anxiety (Last et al., 1991). Therefore the
conclusions of the present study are limited to an analysis of the frequency of events that
are perceived as positive and negative and may not reflect “real” differences in the
negativity of life events. It could be argued that it is the personal experience of life events
that holds the greatest implications for their influence on behavior. Some studies have attempted to address subjective biases by using independent raters to provide an “objective” classification of the valence of checklist items (e.g., Williamson et al., 1995, 2005). However, it is possible that an event perceived as negative by one child could be interpreted as positive (and vice versa) by another given the context surrounding the event and the child’s circumstances. One way to overcome these limitations would be to replicate the present study using interview methodology, enabling contextualised ratings of event valence (Sandberg et al., 1998). Interview methodology would also enable researchers to determine whether it is the subjective or objective impact of events that carries the greatest risk for mental disorder. One final methodological limitation pertains to sample characteristics, as the experiences of this predominantly middle to upper class sample may not be generalizable to children from more disadvantaged backgrounds.

This study also has major strengths, being the first to compare the number and independence of both positive and negative life events in a relatively large sample of anxiety-disordered children and controls. It is also the first study to examine the impact of comorbidity on event frequency, addressing the possibility that any differential report of life events in anxious individuals is entirely accounted for by comorbid disorders. An additional strength was the use of mother and child report to provide dual perspectives on the child’s life. The consistency of findings across mothers’ and children’s reports provides support for the presence of reliable differences between anxious and control children regarding the number and independence of life events. Child age and household income were also controlled statistically, although it would have been preferable for groups to have been matched on these characteristics at the outset.
This study has addressed the possibility that comorbid non-anxiety disorders account for differences between anxious and control children with regard to negative life events. While comorbidity appears to increase the risk for negative behavior-dependent events, it does not fully account for differences between groups. Life events have been associated with many disorders (e.g., Tiet et al., 2001) and may therefore increase children’s vulnerability to psychopathology generally. However, a twin study has indicated that the association between “threat” events and child anxiety is disorder specific (Eley & Stevenson, 2000). Investigation of different aspects of events is needed to determine whether certain qualities of life events are uniquely associated with different disorders (McMahon, Grant, Compas, & Thurm, 2003).

Our findings suggest the need for interventions aimed at altering children’s behavior given the greater number of behavior-dependent negative life events experienced by anxious children. Children with comorbid non-anxiety disorders appear to be in the greatest need for such intervention. Furthermore, interventions that target anxious children’s ability to generate positive life events may also be important in clinical management. Therapies that encourage children to face anxiety-provoking situations in a graded manner and address cognitive biases towards interpreting situations as threatening and/or uncontrollable (e.g., cognitive-behavioral therapy) may be particularly effective in breaking a cycle of symptoms and stressors. As suggested by Sandberg and Rutter (2002), the key may lie in helping children to face challenging situations with a sense of accomplishment rather than protecting children from all potentially stressful experiences.
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Appendix

*Events Most Likely Dependent on Child’s Behavior:*

- Won a prize, award, contest
- New boyfriend or girlfriend
- Parent had to see child’s school principal
- Big fight or argument with someone in family
- Success in an important test or exam
- Break up with boyfriend or girlfriend
- Big argument with someone special (who is not in child’s family)
- New special friend
- Involved in a fight
- Poor performance in an important test or exam
- Class monitor, prefect or school captain
- Seriously told off or punished by a teacher
- New hobby, sport, activity
- Failure of a grade

*Events Most Likely Independent of Child’s Behavior:*

- Moved house
Big family fight or argument (not including child)

Parent started new job

Parent lost job

Parent had a baby or is expecting a baby

Death of family member

Family member really sick or injured

Someone special to child moved away

Someone came to live with family

Saw something bad happen (e.g., car accident)

Parent split up with partner

Mother married, engaged, or began seeing someone

Father married, engaged, or began seeing someone

Child’s pet died, got sick, lost or injured

Someone broke into child’s home

Someone in family left home

Death of someone special

Someone special really sick or injured (who is not in child’s family)

Parent stayed away from home overnight (e.g., hospital, holiday)

Special holiday
References


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