At risk of depression and anxiety
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Sexual assault and emotional problems in young women: Conditional effects of temperament

The long-term response to sexual assault is found to differ between individuals. In a high-risk sample of young women with a history of parental emotional disorders, the present study examined the role of temperament in the association between sexual assault and depression and anxiety problems. History of sexual assault and (facets of) the temperament traits of neuroticism (frustration and discomfort), extraversion (sociability and high pleasure), and effortful control were assessed at baseline and emotional problems at one-year follow-up. The association between moderate sexual assault (i.e., not involving penetration) and emotional problems was strengthened by frustration, whereas the association between severe sexual assault (i.e., involving penetration) and problems was partially mediated by frustration and discomfort. Sociability, high pleasure and effortful control did not moderate or mediate the association. The impact of sexual assault involved the total of emotional problems and not specifically depression or anxiety. We conclude that our results suggest that severe sexual assault predicts emotional problems because it increases temperamental vulnerability to emotional problems, whereas moderate sexual assault leads to emotional problems only in already temperamentally vulnerable individuals.

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Introduction

The prevalence of past sexual assault is increased in women who suffer from depression and anxiety (further denoted as emotional problems) (e.g., Bagley & Mallick, 2000; Fergusson, Horwood, & Lynskey, 1996; Katerndahl, Burge, & Kellogg, 2005; Spataro et al., 2004). Studies examining individual differences in the long-term responses to sexual assault generally focus on the influence of factors related to the assault (e.g., severity and duration of the assault or relationship to the perpetrator), coping strategies, experienced blame or control, or family, social, and other contextual factors (Bagley & Mallick, 2000; Jumper, 1995; Mennen, 1993; Whiffen & MacIntosh, 2005; Wyatt & Newcomb, 1990). Although various studies found that temperament characteristics, especially neuroticism, are associated with increased adversity and modify associations between adversity and mental health (Gothelf et al., 2004; Kendler, Kuhn, & Prescott, 2004a; Ormel, Oldehinkel, & Brilman, 2001; Van Os & Jones, 1999), research addressing the role of temperament in the association between sexual assault and emotional problems is limited and typically assumes mediation rather than moderation effects of temperament (Gamble et al., 2006; Pickering, Farmer, & McGuffin, 2004; Roy, 2002; Talbot et al., 2000). Mediation by temperament implies that sexual assault results in emotional problems through its effect on temperament, whereas moderation by temperament means that the impact of sexual assault on emotional problems depends on temperament. The purpose of this study was to examine mediation and moderation by temperament in the association between sexual assault and emotional problems in a sample of young women.

Temperament represents basic person characteristics in emotional reactivity and self-regulation (e.g., Rothbart, Ahadi, & Evans, 2000) and affects mental health in interaction with the environment (Dadds & Salmon, 2003; Oldehinkel et al., 2006). Temperament appears to be moderately stable during adolescence and young adulthood (Caspi & Roberts, 2001). In the present paper, we focus on the temperament domains of negative affectivity, extraversion and effortful control as assessed by the Adult Temperament Questionnaire (Rothbart, Ahadi, & Evans, 2000). Negative affectivity is similar to neuroticism, while effortful control is related to conscientiousness (Rothbart, Ahadi, & Evans, 2000). Neuroticism, extraversion, and conscientiousness represent the three most salient temperament/personality domains across all major theories of temperament/personality (e.g., Cloninger, 1986; Eysenck & Eysenck, 1985; McCrae & Costa, 1997; Rothbart, Ahadi, & Evans, 2000). We used the facets of frustration and discomfort from the domain of neuroticism, sociability and high pleasure from the domain of extraversion, and effortful control. Effortful control consists of the facets of attentional, inhibitory, and activation control. We did not include the neuroticism facets of
fear and sadness or the extraversion facet of positive affectivity as these, due to operational confounding, may be vulnerable for spurious association with measures of emotional problems (Ormel, Rosmalen, & Farmer, 2004). Based on the limited available literature (Gamble et al., 2006; Kendler, Kuhn, & Prescott, 2004a; Pickering, Farmer, & McGuffin, 2004; Roy, 2002; Talbot et al., 2000), we expect that frustration, discomfort, sociability, and high pleasure are relevant in the association between sexual assault and emotional problems. We have no a priori hypothesis for effortful control, but included this domain for exploratory purposes.

Frustration encompasses the amount of negative affect related to the interruption of ongoing tasks or goalblocking. Individuals high on frustration react strongly and averagely when they feel obstructed or interfered with. Discomfort describes unpleasant affect related to stimulation of the senses. Individuals high on discomfort are, for example, bothered by bright light, loud noises, or the feeling of cloth on their skins. As mentioned before, frustration and discomfort represent facets of neuroticism. High neuroticism is thought to represent increased stress sensitivity that predisposes individuals to the development of emotional problems (e.g., Clark, Watson, & Mineka, 1994; Eysenck & Eysenck, 1985; McCrae & Costa, 1997). Statistical tests of mediation or moderation by neuroticism in the association between sexual assault and emotional problems are, to our knowledge, only reported in the studies of Gamble et al. (2006) and Kendler et al. (2004b). Both studies distinguish between moderate and severe assault. Gamble et al. (2006) studied mediation and found that neuroticism partially mediated the association between severe childhood sexual abuse and depressive symptom severity, but found no association between neuroticism and moderate childhood sexual abuse. Kendler et al. (2004b) did not test mediation by neuroticism, but found evidence for a modifier effect of neuroticism in the association between moderate, but not severe, childhood sexual abuse and risk of depression. In the present study we examined frustration and discomfort both as mediators and moderators of the association between sexual assault and emotional problems, distinguishing between moderate and severe sexual assault. Based on Gamble et al. (2006) and Kendler et al. (2004b), we expect that severe sexual assault increases emotional problems partly by increasing frustration and discomfort, while the strength of the association between moderate sexual assault and emotional problems increases as frustration and discomfort increase.

Sociability describes enjoyment derived from social interaction and being in the presence of others. High pleasure refers to the amount of positive affect related to high intensity-stimuli, situations or activities. As mentioned above, sociability and high pleasure are facets of extraversion (Rothbart, Ahadi, & Evans, 2000). In general, extraversion is negatively associated with emotional problems, especially depression problems (Clark,
Watson, & Mineka, 1994). To our knowledge, no studies examined whether extraversion mediates or moderates the association between sexual assault and emotional problems, but two studies examined the associations between extraversion and sexual assault. Talbot et al. (2000) found that within a sample of women with a history of childhood sexual abuse, those women whose history included both parental abuse and intercourse had relatively low extraversion scores. Talbot et al. (2000) suggest that more severe abuse may decrease extraversion and therefore increase risk of emotional problems. However, Pickering, Farmer, and McGuffin (2004) found a positive association between childhood sexual abuse and extraversion in individuals with a history of depression, suggesting that sexual abuse leads to a more adventurous and sensation-seeking personality or that woman with such personality are more at risk of sexual abuse. We predict that sociability and high pleasure are associated with sexual assault and will examine whether these facets mediate or moderate the association between sexual assault and emotional problems, but have no a priori hypotheses on the direction of effects.

Depression and anxiety can be differentiated by factors that represent low positive affect or hopelessness and physiological hyper-arousal respectively (Brown, Chorpita, & Barlow, 1998; Mineka, Watson, & Clark, 1998). However, when examining possible mechanisms in the development of depression and anxiety it is important to take into account that depression and anxiety are often comorbid (Kessler, 1995) and also share a common factor of psychological distress based on broad individual differences in general problems and negative affect (Brown, Chorpita, & Barlow, 1998; Clark & Watson, 1991). This overlap may conceal that sexual assault or temperament may be specifically associated with either depression or anxiety problems (Clark, Watson, & Mineka, 1994; Ernst, Angst, & Földényi, 1993; Hartman et al., 2007). Therefore, the present study considers whether associations of sexual assault and temperament with emotional problems concern the total of emotional problems, or depression or anxiety problems specifically.

In sum, this article examines mediation and moderation by temperament in the long-term effect of sexual assault on emotional health. We conducted our examinations in a high-risk cohort of adolescent and young-adult women with at least one parent who ever received treatment for depression and/or anxiety disorder. Data on sexual assault were gathered retrospectively at baseline, temperament was assessed at baseline as well, while emotional problems were assessed at one-year follow-up. We distinguished between the effects of severe sexual assault (i.e., involving penetration) and moderate sexual assault (i.e., not involving penetration) and considered whether associations of sexual assault and temperament with emotional problems concerned the total of emotional problems, or depression or anxiety problems specifically.
Method

Participants and Procedure

The present study used data of 278 adolescent and young-adult women from 229 families who participated in the first (T1) and second (T2) assessment waves of the Dutch ARIADNE (Adolescents at Risk of Anxiety and Depression) Study. ARIADNE is a large prospective study into the development and course of depression and anxiety among 520 adolescent and young-adult offspring from 366 families of which one parent had recently received treatment for depression and/or anxiety disorder in a mental health facility in the north of the Netherlands (Landman-Peeters et al., 2005).

At baseline (T1), consenting parents and their offspring were interviewed in person and were also asked to complete a number of questionnaires. Approximately one year later, offspring were sent a second set of questionnaires for the first follow-up assessment (T2).

In our sample, very few men (1.8%; 4 out of 222) reported sexual assault before T1, therefore we only used data of the women in this study. At T1 these women were between 13 and 25 years old (M =18.2; SD =3.3). Drop outs (n=20) and participants (n=278) did not differ in terms of age and anxiety problems at T1, but dropouts more often reported sexual assault before T1 (40% versus 14%; χ²=9.47, p=0.002) and tended to report more depression problems at T1 (M= 29.75 (SD=7.99) for dropouts and M=26.26 (SD=8.54) for participants; t(296)= 1.77, p=0.078).

Measures

Sexual assault. At T1, participants were interviewed about their experience of sexual assault. The questions addressing sexual assault were integrated in an interview about a wide range of potentially traumatic events. For this purpose, we used items from the Post Traumatic Stress Disorder section of the World Mental Health (WMH) Survey Initiative Version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI) (Kessler & Üstün, 2004). The questions addressing sexual assault read: “(1) The next two questions deal with sexual assault. The first one is about rape. We define this as someone either having sexual intercourse with you or penetrating your body with a finger or object when you did not want him/her to, either by threatening you or by using force. Did this ever happen to you? (2) Other than rape, were you ever sexually assaulted or molested?” Additional questions addressed the age at which sexual assault occurred for the first time and whether the respondent experienced sexual assault more
than once. We labeled sexual assault involving penetration as “severe sexual assault” and sexual assault not involving penetration as “moderate sexual assault”.

Temperament. At T1, temperament was assessed by means of the Adult Temperament Questionnaire (ATQ) (Hartman & Rothbart, 2001; Rothbart, Ahadi, & Evans, 2000). Respondents were asked to report on a 4-point Likert scale to what extent temperamental behaviors and cognitions generally applied to them. Frustration was measured by 6 items (e.g., “It doesn’t take very much to make me feel frustrated or irritated”), internal consistency reliability ($\alpha$) for this scale was 0.66. Discomfort was measured by 8 items (e.g., “I’m often bothered by light that is too bright”) with $\alpha=0.64$. Sociability was measured by 6 items (e.g., “I usually like to spend my free time with people”) with an $\alpha$ of 0.72. The High pleasure scale consisted of 12 items (e.g., “When listening to music, I usually like to turn up the volume more than other people”) and showed an $\alpha$ of 0.65. Effortful control was measured by 24 items and describes the ability to voluntarily regulate attention and behavior (e.g., “It is very hard for me to focus my attention when I am distressed”) with $\alpha=0.84$.

Emotional problems. The DSM-IV Questionnaire (Hartman, 2002; Hartman et al., 2001; Muris, 2006; Muris, Winands, & Horselenberg, 2003) was used to assess depression and anxiety problems at T2. Items in the questionnaire refer to symptoms as used in the Diagnostic and Statistical Manual of mental disorders (4th edition) (DSM-IV) classification system (American Psychiatric Association, 1994). Respondents were asked to report on a 4-point Likert-scale to what extent each symptom (behavior, cognition, feeling) accurately describes their behavior in the months preceding the assessment. The DSM-IV Questionnaire has two advantages for the present study. Firstly, it yields continuous symptom scores, as such measuring also subclinical levels in our high-risk group. Secondly, it has a direct substantive relation to DSM-IV diagnoses (Landman-Peeters et al., 2005).

To create scales for depression and anxiety problems that differentiate between these problems as much as possible, we conducted a factor analysis with a two-factor solution on the depression and anxiety items. We constructed two scales such that only those items were selected which loaded on their own factor with a loading ≥0.30 and a difference ≥0.20 between this main loading and the additional loading on the other factor. The Depression symptoms scale consists of 15 items (e.g., “I am often unhappy”, “I am low in energy or feel tired for no reason”). The Anxiety symptoms scale consists of 17 items (e.g., “I suddenly become very anxious or panicky for no reason”). Internal
consistency reliability was 0.94 for the Depression problems scale and 0.90 for the Anxiety problems scale. The Depression and Anxiety scales were standardized and summed to create the scale representing Total emotional problems. The internal consistency reliability of this composite scale was 0.95.

**Data analysis**

We first examined the bivariate associations between the variables in this study. ANOVA and Dunnetts’ t post-hoc analysis were used to test whether mean scores of the women with a history of severe sexual assault and women with moderate sexual assault were significantly different from those of women without a history of sexual assault. The associations between temperament and emotional problems were examined by means of correlation analysis.

We examined the role of temperament in the associations between sexual assault and emotional problems by means of stepwise regression analyses. All variables were standardized to improve interpretability and prevent computational problems due to multicollinearity that may occur with variables and their products (Aiken & West, 1991). A p-value smaller than 0.05 was considered statistically significant. We first examined moderation by temperament. In the first step of the regression analysis, we entered the temperament variables and two dummy variables for sexual assault. The dummy variables represented the effects of moderate sexual assault and severe sexual assault in comparison to no sexual assault. We then examined in the second step whether interactions of sexual assault with temperament were significant by means of forward analysis.

Mediation requires that the mediator is significantly associated with both the outcome and the predictor variable (Baron & Kenny, 1986). In the present study temperament must therefore be associated with both sexual assault and emotional problems to be able to act as a mediator. Potential mediators were identified by means of the results of the ANOVA and correlation analyses. Using stepwise regression analysis, we then examined whether the magnitude of the associations between the sexual assault variables and emotional problems decreased when the potential mediator was added to the regression equation. We tested whether the mediation effect was significant by means of the Sobel test (Baron & Kenny, 1986). Mediation was examined for each temperament variable separately.

To examine whether the associations between sexual assault and temperament are specific for either depression or anxiety, we ran the analyses mentioned above again, but partialled out shared variance by including anxiety problems in the analyses of depression problems and depression problems in the analysis on anxiety problems, respectively. We thus examined associations of sexual assault and temperament with the type of problems.
Temperament and stress

(i.e., unique depression and unique anxiety) rather than the extent to which problems were present.

The 278 respondents in the present study came from 229 families. To account for this clustering of observations in families, we conducted design-based analyses with families as primary sampling units, using the statistical program STATA 8.0 (StataCorp, 2003).

Results

Descriptives and correlations

In total, 39 (14.0%) respondents in our sample reported sexual assault. In 20 of 39 women sexual assault involved penetration. Mean age at first experience was 12.4 years old ($SD=5.5$). This did not differ between women with moderate and women with severe sexual assault.

Table 1 presents means on emotional problems and temperament for the women with no history of sexual assault, women with a history of moderate sexual assault and women with a history of severe sexual assault. Women with a history of severe sexual assault had significantly more total emotional problems, more depression, and more anxiety at T2, than women without a history of sexual assault. Compared to women without sexual assault, women with severe sexual assault also had higher scores on the

Table 1 Means ($SD$) of and test-statistics of differences between women with no history of sexual assault and women with a history of moderate sexual assault or severe sexual assault

<table>
<thead>
<tr>
<th></th>
<th>No sexual assault</th>
<th>Moderate sexual</th>
<th>Severe sexual assault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total emotional problems</td>
<td>-.20 (1.65)</td>
<td>.52 (2.26)</td>
<td>1.85 ( 2.17)***</td>
</tr>
<tr>
<td>Depression problems</td>
<td>25.59 (7.72)</td>
<td>28.21 (9.33)</td>
<td>33.25 ( 9.03)***</td>
</tr>
<tr>
<td>Anxiety problems</td>
<td>22.30 (5.80)</td>
<td>25.00 (9.59)</td>
<td>29.90 (10.71)***</td>
</tr>
<tr>
<td>Frustration</td>
<td>23.68 (3.90)</td>
<td>24.32 (3.68)</td>
<td>25.65 ( 3.84)*</td>
</tr>
<tr>
<td>Discomfort</td>
<td>18.37 (2.86)</td>
<td>18.47 (2.17)</td>
<td>20.10 ( 2.59)**</td>
</tr>
<tr>
<td>Sociability</td>
<td>18.62 (2.43)</td>
<td>17.05 (3.96)*</td>
<td>17.95 ( 3.20)</td>
</tr>
<tr>
<td>High Pleasure</td>
<td>32.54 (4.62)</td>
<td>33.58 (3.63)</td>
<td>30.80 ( 5.15)</td>
</tr>
<tr>
<td>Effortful Control</td>
<td>60.40 (7.81)</td>
<td>61.47 (7.86)</td>
<td>60.80 ( 9.04)</td>
</tr>
</tbody>
</table>

Total emotional problems score is sum of standardized depression problems and anxiety problems scores; $p$-values of difference with No sexual assault group; *$p<.05$; **$p<.01$; ***$p<.001$
temperament facets of frustration and discomfort. They did not differ on sociability, high pleasure, or effortful control. Women with a history of moderate sexual assault tended to have more total emotional problems and more anxiety, than women without a history of sexual assault, but these differences were marginal and failed to reach significance ($p=0.083$ and $p=0.082$ respectively). These women further had a significantly lower mean on the temperament facet of sociability than women without a history of sexual assault, but did not differ on any of the other temperament variables.

Frustration and discomfort were positively correlated with total emotional problems ($r=0.415$, $p<0.001$ for frustration and $r=0.265$, $p<0.001$ for discomfort), while sociability and effortful control were negatively associated with total emotional problems ($r=-0.329$, $p<0.001$ for sociability and $r=-0.290$, $p<0.001$ for effortful control). Associations of these facets with the separate measures of depression and anxiety problems were similar. The facet of high pleasure was not significantly associated with the measures of total emotional problems, depression problems, or anxiety problems.

**Table 2** Regression coefficients (SE) of sexual assault, temperament and interaction from moderation analyses on total emotional problems, depression problems, and anxiety problems

<table>
<thead>
<tr>
<th></th>
<th>Total emotional problems</th>
<th>Depression problems (adjusted for anxiety problems)</th>
<th>Anxiety problems (adjusted for depression problems)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate sexual assault</td>
<td>.05 (.05)</td>
<td>.01 (.05)</td>
<td>.05 (.05)</td>
</tr>
<tr>
<td>Severe sexual assault</td>
<td>.21 (.05)***</td>
<td>.06 (.07)</td>
<td>.13 (.08)</td>
</tr>
<tr>
<td>Frustration</td>
<td>.23 (.07)***</td>
<td>.11 (.07)</td>
<td>.08 (.06)</td>
</tr>
<tr>
<td>Discomfort</td>
<td>.12 (.06)*</td>
<td>.00 (.05)</td>
<td>.09 (.05)</td>
</tr>
<tr>
<td>Sociability</td>
<td>-.17 (.06)**</td>
<td>-.14 (.06)*</td>
<td>-.03 (.09)</td>
</tr>
<tr>
<td>High Pleasure</td>
<td>-.03 (.06)</td>
<td>-.04 (.05)</td>
<td>.03 (.05)</td>
</tr>
<tr>
<td>Effortful Control</td>
<td>-.16 (.07)*</td>
<td>-.05 (.07)</td>
<td>-.07 (.06)</td>
</tr>
<tr>
<td>Moderate sexual assault × Frustration</td>
<td>.15 (.04)**</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Severe sexual assault × Frustration</td>
<td>.07 (.05)</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Regression coefficients of standardized variables; * $p<.05$; ** $p<.01$; *** $p<.001$

**Moderation analyses**

Table 2 presents the results of the moderation analysis on total emotional problems. These results included significant main effects for severe sexual assault, frustration, discomfort, sociability, and effortful control and a significant interaction between moderate sexual
assault and frustration. Severe sexual assault, frustration, and discomfort were associated with higher levels of emotional problems, while sociability and effortful control were associated with lower levels of emotional problems. The effect of moderate sexual assault before T1 depended on frustration scores at T1, such that moderate sexual assault increased emotional problems in women high on frustration, but not in women low on frustration (see Figure 1).

The results of analyses that addressed unique depression and unique anxiety show that none of the temperament variables moderated the association between sexual assault and depression or anxiety problems specifically. Moreover, except for the facet of sociability, sexual assault and temperament did not significantly predict depression or anxiety problems beyond the extent that they predicted the extent to which emotional problems were present. Sociability was negatively associated with depression problems when anxiety problems were controlled for, but was not associated with anxiety problems when we controlled for depression problems.

**Mediation analysis**

The ANOVA analyses showed that women with severe sexual assault, but not women with moderate sexual assault, had significantly more emotional problems than women with no history of sexual assault (see Table 1). Mediation can therefore only be present in the
association between severe sexual assault and emotional problems. Women with severe sexual assault also reported more frustration and discomfort than women with no sexual assault. As frustration and discomfort were significantly associated with emotional problems as well, these facets are potential mediators of the association between severe sexual assault and emotional problems. Data from the women with moderate sexual assault were excluded from the mediation analyses. Furthermore, we did not examine mediation for depression and anxiety specifically, as severe sexual assault was not specifically associated to depression or anxiety problems. Results of the mediation analyses (see Table 3) show that the effect of severe sexual assault on total emotional problems decreased slightly, but statistically significant, by adding either frustration (model 2a) or discomfort (model 2b) to the regression equation. The effect of severe sexual assault further decreased when both facets were added to the regression equation (model 3). The regression coefficients in model 3 indicate that the direct effects of severe sexual assault, frustration, and discomfort on total emotional problems were similar, with severe sexual assault accounting for 5%, discomfort for 4% and frustration for 10% explained variance.

Table 3 Analyses of mediation of the association between severe sexual assault and total emotional problems by frustration and discomfort

<table>
<thead>
<tr>
<th>Model</th>
<th>B (SE B)</th>
<th>Sobel statistic</th>
<th>Sobel p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1</td>
<td>Severe sexual assault</td>
<td>.29 (.06)***</td>
<td></td>
</tr>
<tr>
<td>Model 2a</td>
<td>Severe sexual assault</td>
<td>.25 (.06)***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frustration</td>
<td>.35 (.06)***</td>
<td>2.03</td>
</tr>
<tr>
<td>Model 2b</td>
<td>Severe sexual assault</td>
<td>.25 (.06)***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Discomfort</td>
<td>.24 (.06)***</td>
<td>2.22</td>
</tr>
<tr>
<td>Model 3</td>
<td>Severe sexual assault</td>
<td>.22 (.06)***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frustration</td>
<td>.32 (.06)***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Discomfort</td>
<td>.19 (.06)**</td>
<td></td>
</tr>
</tbody>
</table>

Regression coefficients of standardized variables: * p<.05; ** p<.01; *** p<.001
Discussion

This study examined the role of temperament in the association of sexual assault with emotional problems. So far, only a limited number of studies addressed the associations between sexual assault, temperament and emotional problems (Gamble et al., 2006; Kendler, Kuhn, & Prescott, 2004a, 2004b; Pickering, Farmer, & McGuffin, 2004; Roy, 2002; Talbot et al., 2000). Moreover, these studies typically did not examine or distinguish between mediating and moderating processes. This is important to understand fully the interplay of sexual assault and temperament in their influence on mental health (Whiffen & MacIntosh, 2005). We found that the effect on emotional problems of moderate sexual assault (i.e. not involving penetration), but not severe sexual assault (i.e., involving penetration), was moderated by a temperament that is high on frustration, while the effect of severe sexual assault, but not moderate sexual assault, was partly mediated by both frustration and discomfort. No moderation or mediation effect was found for sociability, high pleasure, and effortful control. We further found that sexual assault was associated with the total of emotional problems and not specifically with depression or anxiety.

The results of our study are in line with both Gamble et al. (2006), who found that neuroticism mediated the association between severe sexual assault and emotional problems, and Kendler, Kuhn, and Prescott (2004b), who found evidence for moderation by neuroticism in the association between moderate childhood sexual abuse and risk of depression. Our results indicate that the effect of moderate sexual assault on emotional problems is stronger in individuals high on frustration. We found that severe sexual assault, frustration, and discomfort were independently and similarly associated with emotional problems. Thus, sexual assault involving penetration seems to be associated with higher levels of emotional problems regardless of the level of neuroticism. In addition, severe sexual abuse is associated with emotional ill-health because it tends to increase neuroticism, as indicated by the mediation effects observed for frustration and discomfort.

In the present study, sociability and high pleasure represented extraversion. In comparison with women with no sexual assault, women with moderate sexual assault had lower sociability, but women with severe sexual assault did not differ from the no assault group. High pleasure was not associated with sexual assault. Our findings are in contrast with the findings of both Pickering et al. (2004) and Talbot et al. (2000). In individuals with a history of depression, Pickering et al. (2004) found a positive association between childhood sexual abuse and extraversion, suggesting that sexual abuse leads to a more sensation-seeking and adventurous personality or that women with this personality are at increased risk to experience sexual abuse. Talbot et al. (2000) found that women with
severe childhood sexual abuse reported lower extraversion than women with less severe sexual abuse. Measures of extraversion generally include assessments of positive affect, which is strongly and negatively associated with emotional problems. Possibly, the result of Talbot et al. was based largely on higher levels of emotional problems in women with severe abuse. Extraversion may not be associated with sexual assault or sexual assault may affect extraversion in both directions, such that extraverted individuals become more extraverted and introverted individuals more introverted, canceling out any effect in our total group.

Sexual assault or temperament may be specifically associated with either depression or anxiety (Clark, Watson, & Mineka, 1994; Ernst, Angst & Földényi, 1993; Hartman et al., 2007). The present findings suggest that the effects of sexual assault does not differentiate between depression or anxiety, but rather is associated with the extent to which emotional problems are present.

The results of the present study should be interpreted in the context of the following potentially significant limitations. First, our sample consisted of adolescent and young-adult daughters of people treated for emotional disorders at least once during their life. Risk to develop emotional problems is higher in offspring of affected parents than in offspring of non-affected parents, partly due to an increased risk to experience stressful life-events, such as sexual assault (Bifulco, Moran, & Ball, 2002; Walsh, MacMillan, & Jamieson, 2002; Young et al., 1997). Higher levels of emotional problems and a higher prevalence of sexual assault may limit the generalizability of our findings. On the other hand, as high-risk populations offer more variance on both risk and outcome variables, mechanisms relevant to the development of depression and anxiety are more likely to surface in such samples (Garber & Flynn, 2001). Secondly, sexual assault that had occurred before T1 was measured retrospectively and at the same point in time as temperament. We therefore cannot rule out memory biases or be sure about the direction of causality. In principle, it is possible that frustration and discomfort increased risk of sexual assault and thus that sexual assault mediated the associations between frustration and discomfort on the one hand and emotional problems on the other. However, in that case one would expect that these facets were associated with both moderate and severe sexual assault, while our findings and those of Gamble et al. (2006) only indicate associations with severe sexual assault. Thirdly, our distinction between moderate and severe sexual assault was based on the distinction between sexual assault involving and not involving penetration and ignored potentially important differences between prolonged and single occasions of sexual assault. We had no reliable information concerning the duration of sexual abuse. Moreover, the relatively small number of women with a history
of sexual assault did not permit further distinctions. Fourthly, attrition between T1 and T2 may have weakened associations.

Assets of the present study are that we investigated temperament as a potential mediator and moderator of the association between sexual assault and emotional problems, assessed temperament and emotional problems at different measurement waves, limited potential confounding between measures of neuroticism and extraversion and measures of emotional problems by omitting the temperament scales assessing sadness, fear, and positive affectivity, and examined whether sexual assault is associated with emotional problems in general or depression or anxiety problems specifically.

Sexual assault or abuse in childhood and adolescence, although often associated with other risk factors for emotional problems (e.g., physical and emotional abuse, family environment, and socioeconomic status) (Kendler et al., 2000), has a “unique, diverse, and substantial impact” on emotional problems and risk factors for emotional problems (Kendler, Gardner, & Prescott, 2002). Findings from the present study indicate that the role of temperament in the association between sexual assault and emotional problems is conditional as it depends on the severity of sexual assault. The association between severe sexual assault and emotional problems is partially explained by increased temperamental vulnerability to emotional problems in women with a history of severe sexual assault. In contrast, mild to moderate sexual assault seems to increase emotional problems only in already temperamentally vulnerable individuals.