

Childhood adversity and anxiety *versus* dysthymia co-morbidity in major depression

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ABSTRACT

Background. Childhood adversity places individuals with major depression at risk for anxiety and dysthymia co-morbidity. The goal of the present paper is to broaden this area of research by examining specificity between the type of adversity (e.g. abuse *versus* neglect/indifference) and the resulting co-morbid disorder (e.g. anxiety *versus* dysthymia co-morbidity).

Method. The volunteer sample consisted of 76 women meeting Diagnostic and Statistical Manual (DSM-IV) criteria for major depression. Of these, 28 were diagnosed with a co-morbid anxiety disorder and 21 were diagnosed with co-morbid dysthymia. Childhood physical abuse, sexual abuse, psychological abuse, antipathy and indifference were assessed using a contextual interview and rating system.

Results. Severe sexual abuse and psychological abuse were significantly and preferentially associated with co-morbid anxiety, while severe physical abuse was significantly and preferentially associated with co-morbid dysthymia. Indifference and antipathy were significantly associated with both co-morbid anxiety and dysthymia. Multivariate analyses revealed that severe sexual abuse was the adverse childhood experience most strongly associated with co-morbid anxiety.

Conclusions. These results suggest that particular adverse experiences in childhood do set up specific vulnerabilities to the expression of anxiety *versus* dysthymia co-morbidity in adulthood major depression. Cognitive mediators of these associations are discussed as avenues of future research.

INTRODUCTION

Studies conducted over the past 20 years have indicated that major depressive disorder (MDD) presents with a substantial degree of co-morbidity. Rates of anxiety disorders co-morbid with major depression exceed 50% in patient and epidemiological samples (DiNardo & Barlow, 1990; Zung *et al.* 1990; Kessler *et al.* 1996; Brown *et al.* 2001), and rates of co-morbid dysthymia are close to 30% (Keller & Shapiro, 1982). Anxiety and dysthymia co-morbidity are associated with more severe symptomatology and place depressed patients at significantly greater risk for relapse and recurrence over those with MDD alone (Keller *et al.* 1983*a, b*; Coryell *et al.* 1988; Klein *et al.* 1988; Levitt *et al.*

1991; Sherbourne & Wells, 1997). Since co-morbidity is associated with such a poor prognosis in depression, studies examining factors that place individuals at risk for co-morbidity have important clinical implications.

A large number of cross-sectional and prospective studies have documented that parental indifference (i.e. emotional and/or material neglect), antipathy (i.e. hostility and/or coldness) and physical, sexual, and psychological abuse play a significant role in the onset of MDD (Bifulco *et al.* 1991, 1994; Young *et al.* 1997), the anxiety disorders (Brown & Harris, 1993; Brown *et al.* 1993, 1996; Stein *et al.* 1996) and dysthymia (Lizardi *et al.* 1995). Furthermore, studies have found higher rates of adverse childhood experiences in patients with co-morbid depression and anxiety than in patients with pure depression or pure anxiety (Alnæs & Torgerson, 1990; Mancini *et al.* 1992).

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An important question that has received very minimal attention is whether specificity exists between the type of adverse childhood experience and the particular pattern of co-morbidity that is expressed. For example, the experience of physical or sexual abuse in childhood may evoke cognitive themes ('schemas') of danger, threat, and loss of control. Such cognitions have been associated with the hypervigilance, worry and somatic symptoms of the anxiety disorders (Clark *et al.* 1990). By extension, experiences of childhood abuse may be preferentially associated with anxiety disorders co-morbid with MDD. By contrast, parental indifference may evoke themes of worthlessness and loss of positive regard. As such, this experience may be preferentially associated with symptoms of chronic dysphoria and low self-esteem characteristic of dysthymia co-morbid with MDD.

Determining specificity between types of early adverse experiences and particular patterns of co-morbidity in MDD is important from a theoretical perspective, as it would allow researchers to refine models of aetiology and pathology in MDD to include specific links between early experience and resulting psychopathology. From a clinical perspective, determining the types of early adverse experiences that confer risk for specific co-morbid conditions in MDD would allow clinicians to target individuals with early intervention programmes that are specifically designed for a primarily anxious *versus* dysphoric presentation.

Brown & Harris (1993) examined the specificity between physical abuse *versus* indifference and a depression *versus* anxiety diagnosis in adulthood. In contrast to specificity, they found that both indifference and physical abuse were significantly associated with both depression and anxiety. In order to reconcile these findings, Brown & Harris (1993) suggested that parental indifference and physical abuse contain elements of both loss and danger: 'Abuse may involve not only an inducement to vigilance against future damage but also a loss of self worth. Similarly, indifference may imply not only a loss of regard but also a threat to future security' (p. 151). However, the diagnostic groups employed by Brown & Harris (1993) included women with 'anxiety with or without depression' and 'depression with or without anxiety'. Therefore, both groups included individuals with co-morbid

presentations, and, as such, it is not surprising that the groups were each associated with indifference and physical abuse.

In the present study, we examine the association of childhood physical abuse, sexual abuse, psychological abuse, antipathy, and indifference to anxiety *versus* dysthymia co-morbidity in a sample of women with MDD. This research improves and expands upon previous studies in a number of ways. First, similar to the studies conducted by Brown and colleagues, we assess childhood experience using the rigorous Childhood Experience of Care and Abuse scale (CECA) (Bifulco *et al.* 1994), a contextual interview and standardized rating system. Secondly, we examine a range of experiences in both univariate and multivariate models. It is possible that while diverse experiences may confer vulnerability to anxiety and dysthymia co-morbidity in MDD when examined univariately, preferential associations may emerge when these variables are investigated simultaneously in multivariate models. Consistent with the hypothesis of Brown & Harris (1993), we predict that physical, sexual, and psychological abuse will be significantly and preferentially associated with co-morbid MDD and anxiety, while indifference and antipathy will be significantly and preferentially associated with co-morbid MDD and dysthymia.

Physical abuse in the CECA is confined to abuse perpetrated by parents, while sexual abuse may involve any perpetrator. However, studies examining sexual abuse suggest that abuse perpetrated by a close relative has more damaging effects on later psychological functioning than does sexual abuse perpetrated by a non-related individual (Beitchman *et al.* 1991; Molnar *et al.* 2001). Therefore, we also examine whether specificity emerges in the association of sexual abuse to anxiety disorder *versus* dysthymia co-morbidity depending upon the relationship of the perpetrator to the victim.

METHOD

Participants

Participants were 76 women, ranging in age from 18 to 70 with a mean age of 37.30 (s.d. 11.2) who were taking part in a larger study investigating the psychosocial predictors of MDD (see

Harkness & Luther, 2001 for more details about the sample). They were recruited from a mid-sized community in the Northwestern United States through newspaper advertisements and requests on local television news programmes targeted toward women suffering from symptoms of depression. Ninety-one per cent of the sample was European-American ($N = 69$), 42% ($N = 32$) were married, 38% ($N = 29$) had graduated from college and 64% ($N = 49$) were either students or employed outside the home. Fifty-one per cent of participants ($N = 39$) were receiving out-patient treatment in the community for their depression.

All women met Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) (American Psychiatric Association, 1994) criteria for a current episode of primary non-psychotic, non-bipolar MDD. Exclusion criteria included the presence of schizophrenia, schizoaffective disorder, bipolar disorder, psychotic subtype of MDD, active substance abuse or dependence, eating disorder, and concurrent medical disorder that could cause depression. Acutely suicidal participants and participants whose index major depressive episode had lasted more than 2 years (i.e. chronic MDD) were also excluded. Women with chronic MDD were excluded to ensure that all participants had an equal potential for experiencing co-morbid dysthymia (i.e. dysthymia preceding and persisting between discrete episodes of MDD).

A total of 245 women participated in a phone screen to determine eligibility for the study. The screen included questions regarding exclusionary diagnoses and administration of the major depressive episode module of the Structured Interview for DSM-IV Axis I Disorders (SCID) (First *et al.* 1995). The phone screens were administered by two advanced graduate students who had been extensively trained in the SCID (see below). Of the 245 potential participants, 90 met study criteria and were scheduled for an interview.[†] Of these, 14 did not meet criteria for a current major depressive episode based on the full diagnostic interview described below, dropping the final sample to 76. All participants who presented at the interview provided written informed consent. Following the interview, women were paid for their involvement in the

study, were provided with a list of treatment referrals, and were invited to attend a 3 h cognitive-behavioural treatment workshop for depression.

Measures

Diagnostic

Two advanced graduate students in clinical psychology administered the full SCID (First *et al.* 1995) to all participants to determine a primary diagnosis of MDD and co-morbid dysthymia and anxiety disorder diagnoses. Interviewers were previously trained to reliability with consecutive patient referrals to the University Psychology Clinic. In order to achieve 'gold standard' reliability status, trainees had to match the diagnosis of a gold standard rater on at least three consecutive SCID interviews. Gold standard raters included clinical faculty members and other advanced graduate students who had previously achieved reliability status. Such methods are typically employed in order to train raters to gold standard status (see Grove *et al.* 1981).

Depression severity

The 17-item Hamilton Rating Scale for Depression (HRSD) (Hamilton, 1960) and the 21-item self-report Beck Depression Inventory (BDI) (Beck & Steer, 1987) were administered to assess the presence and severity of depressive symptoms. Both measures have excellent reliability and validity in the study of depression (Rehm & O'Hara, 1985; Beck *et al.* 1988). The mean HRSD and BDI scores for the women in this study were 18.26 (s.d. 5.29) and 28.50 (s.d. 8.46), respectively. These scores are comparable to those of other outpatient samples in the literature (Simons & Thase, 1992).

Childhood adversity

The Childhood Experience of Care and Abuse scale (CECA) (Bifulco *et al.* 1994) is a semi-structured retrospective contextual interview assessing the quality of parental care and abuse in the household prior to age 18. A trained clinician conducted the interviews. Subsequent to the interview, five scales were rated according to standardized criteria by the first author, who was trained in the Bedford College method of rating childhood adversity by Dr Bifulco in

[†] The notes will be found on page 1248.

London. A manual containing hundreds of case exemplars was available to help with the ratings of: (a) antipathy, hostility or coldness directed toward the child by parents (e.g. frequent harsh criticism or name-calling); (b) indifference, neglect of the child's physical and/or emotional needs by parents (e.g. not providing adequate food or clothing, not comforting the child when upset); (c) physical abuse, violence toward the child by parents (e.g. spanking, punching, hitting with an object, or threatening with a knife); (d) sexual abuse, non-consensual sexual contact by any perpetrator, including fondling, oral sex, and/or anal or vaginal penetration; and (e) psychological abuse, humiliation, terrorizing, extreme rejection, or exploitation of the child by parents (see Bifulco *et al.* 1994 for more details on the scales).

All variables were rated on a 4-point threat scale (1-marked, 2-moderate, 3-some, 4-little/none). An additional clinician rated 12% of the CECA interviews. The raters achieved 100% agreement on the antipathy, indifference, and psychological abuse scales ($\kappa = 1.00$), 87.5% agreement on the sexual abuse scale ($\kappa = 0.75$), and 77% agreement on the physical abuse scale ($\kappa = 0.63$). All discrepancies were resolved through consensus. Prior studies using the CECA have reported inter-rater reliabilities ranging from $\kappa = 0.78$ – 1.00 (Bifulco *et al.* 1994).

The CECA method has a number of advantages over self-report questionnaires of childhood experience. In particular, respondents are interviewed at length about the context of their childhood and are encouraged to 'tell a story' about their experiences. In addition, they are probed in detail about potential positive and negative experiences to support their impressions. In this way, the CECA is less influenced by a depressive bias in the recall of childhood experience, and the retrospective recall is more likely to be accurate (Brewin *et al.* 1993).

RESULTS

Descriptive characteristics of the sample

The antipathy and indifference scales in the present sample were negatively skewed due to proportionately larger numbers of women with moderate or marked levels of antipathy and indifference than with some or little/none levels.

In addition, the three abuse scales were bimodal, reflecting proportionately larger numbers of women with no abuse and with moderate and marked levels of abuse than with some or little levels of these variables. This is to be expected in a depressed sample, and our distributions of CECA variables are similar to those reported by other investigators. In order to address this violation of the normality assumption, the CECA scales were dichotomized to form severe (ratings of 1 or 2) and non-severe (ratings of 3 or 4) groups, consistent with the conventions of the CECA (Bifulco *et al.* 1994).

Thirty-four per cent ($N = 26$) of the sample reported severe indifference and 33% ($N = 25$) reported severe antipathy. The percentages of participants with severe physical, sexual, and psychological abuse were 32% ($N = 24$), 45% ($N = 34$) and 24% ($N = 19$), respectively. Among those with severe physical abuse, 54% ($N = 13$) were beaten with a belt, strap, or ruler on a weekly or monthly basis, while 12.5% ($N = 3$) were slapped or punched in the face or body on a weekly basis. These experiences were generally reported by women as occurring when they 'broke the rules'. An additional 33% ($N = 8$) were beaten badly and often unpredictably (e.g. whipped with an electrical cord, threatened with a cleaver, burned, hit with a shovel, choked, punched in the ribs, bashed head against a wall, beaten). Among those with severe sexual abuse, 74% ($N = 25$) reported forced intercourse, while the remaining nine reported fondling or forced oral sex. Almost half (14/34) reported more than one perpetrator.

Those who reported severe *versus* non-severe levels of these CECA variables did not differ in marital status, education, occupation, number of previous depressive episodes, or current treatment status. However, those reporting severe sexual abuse were significantly younger than those without (33.95 (s.d. 10.04) *v.* 41.03 (s.d. 11.20), $t = 2.90$, $df = 74$, $P < 0.005$). Results for the primary analyses including age as a covariate did not differ from the uncontrolled analyses, thus only the uncontrolled results are presented below.

Only 17% ($N = 13$) of participants met full DSM-IV criteria for dysthymia. However, an additional eight participants met full symptomatic criteria for dysthymia, but did not meet the temporal criteria (i.e. their symptoms did not

Table 1. Frequencies and percentages of women with co-morbid anxiety and dysthymia by severe childhood adversity

		Co-morbid anxiety (N = 28)			Co-morbid dysthymia (N = 21)			Total N
		No % (N)	Yes % (N)	χ^2	No % (N)	Yes % (N)	χ^2	
Sexual abuse	No	74 (31)	26 (11)	4.58*	79 (33)	21 (9)	1.81	42
	Yes	50 (17)	50 (17)		88 (22)	35 (12)		34
Psychological abuse	No	70 (40)	30 (17)	4.83*	74 (42)	26 (15)	0.20	57
	Yes	42 (8)	58 (11)		68 (13)	32 (6)		29
Physical abuse	No	69 (36)	31 (16)	2.61	81 (42)	19 (10)	5.81*	52
	Yes	50 (12)	50 (12)		54 (13)	46 (11)		24
Antipathy	No	71 (36)	29 (15)	3.68*	80 (41)	20 (10)	4.99*	51
	Yes	48 (12)	52 (13)		56 (14)	44 (11)		25
Indifference	No	72 (36)	28 (14)	4.91*	80 (40)	20 (10)	4.26*	50
	Yes	46 (12)	54 (14)		58 (15)	42 (11)		26

* $P < 0.05$.

Table 2. Correlations among the childhood adversity variables

	Physical abuse	Sexual abuse	Psychological abuse	Antipathy	Indifference
Physical abuse	—				
Sexual abuse	0.19	—			
Psychological abuse	0.26*	0.03	—		
Antipathy	0.37**	0.16	0.50***	—	
Indifference	0.34**	0.19	0.61***	0.74***	—

* $P < 0.05$; ** $P < 0.005$; *** $P < 0.001$.

begin a full 2 years prior to the onset of the first major depressive episode). For the purposes of the present analyses, this more inclusive sample of 21 participants comprised the comorbid dysthymia group (see Harkness & Luther, 2001).

Thirty-seven per cent ($N = 28$) of participants suffered from at least one co-morbid anxiety disorder: post-traumatic stress disorder (PTSD) ($N = 17$); panic disorder ($N = 16$); social phobia ($N = 12$); and, specific phobia ($N = 4$). Finally, the present sample reported a median number of previous depressive episodes of five (range 0–20). Eight women were on their first episode.

Adversity and co-morbidity: preliminary univariate analyses

A series of two-tailed 2×2 Pearson χ^2 analyses were conducted to test the univariate associations among the CECA variables and anxiety and dysthymia co-morbidity (see Table 1). Consistent with hypotheses, severe sexual abuse and severe psychological abuse were significantly

associated with anxiety co-morbidity, but neither were significantly associated with dysthymia. Contrary to expectations, severe physical abuse was significantly associated with the presence of dysthymia co-morbidity, while no evidence was found for a significant association with anxiety co-morbidity. No evidence was found for a specific association between antipathy or indifference and anxiety *versus* dysthymia co-morbidity. Severe antipathy and severe indifference were significantly associated with both co-morbid anxiety and co-morbid dysthymia.

Adversity and co-morbidity: multivariate models

The scales of CECA are highly inter-correlated (see Table 2). Not surprisingly, parents who show antipathy toward their child are also more likely to be emotionally or physically neglectful and abusive. While the CECA scales were not meant to be independent, this high degree of inter-correlation poses a problem for multivariate analyses. Bifulco and colleagues' approach

Table 3. *Rotated factor matrix of childhood adversity variables*

Variable	Factor I (Poor care)	Factor II (Sexual abuse)
Antipathy	0.837	0.198
Indifference	0.877	0.187
Psychological abuse	0.822	-0.0078
Physical abuse	0.447	0.479
Sexual abuse	-0.0018	0.930

to this issue has been to create composite variables that are composed of the CECA variables with the strongest univariate association to the dependent variable of interest. Their 'childhood adversity index', made up of the presence *versus* absence of severe physical abuse and/or severe sexual abuse and/or severe indifference, is strongly associated with depression onset (Bifulco *et al.* 1994), chronicity (Brown *et al.* 1994), and co-morbid anxiety (Brown *et al.* 1993).

Bifulco and colleagues' approach helps significantly with data reduction and, as a result, describes relations between the CECA variables and illness in a more parsimonious manner. However, the childhood adversity index is not necessarily reflective of the pattern of correlations among the CECA variables. As a result, it may confound theoretically and empirically distinct constructs. In the present study, we sought to reduce the data empirically by performing a principal components analysis on the five CECA scales. Only those factors that exceeded an eigenvalue of 1.0 during initial extraction of factors were retained in the final analysis. Items with loadings of 0.32 or higher were considered to load on a factor. Two factors emerged, accounting for 70.38% of the total variance. The factor structure, following varimax rotation, is presented in Table 3. The first factor, explaining 50.12% of the variance, is theoretically consistent with the construct of 'poor care', and included high loadings for antipathy, indifference, and psychological abuse. The second factor, explaining an additional 20.26% of the variance, included a high loading for sexual abuse. Physical abuse demonstrated moderate loadings on both factors in the initial and rotated solutions.

Based on the results of the principal components analysis, a composite variable was created

and labelled 'poor care'. This variable was defined as the presence or absence of severe psychological abuse and/or severe antipathy and/or severe indifference. Physical abuse was not included in the composite since it loaded on both factors, thus limiting its discriminant validity in multivariate models. Forty-three per cent ($N = 33$) of the sample reported poor care.

Co-morbid dysthymia

Because all of the variables that were significantly univariately associated with co-morbid dysthymia were highly inter-correlated and loaded together on the same factor (antipathy, indifference, and physical abuse), it is not possible to statistically determine which one is most strongly associated with dysthymia co-morbidity. Nevertheless, we can suggest that these three variables are reflective of the same underlying construct that is significantly associated with high rates of dysthymia co-morbidity in MDD.

Co-morbid anxiety

A logistic regression analysis was performed to determine whether sexual abuse or poor care was most strongly associated with co-morbid anxiety. The model testing the association of severe sexual abuse and poor care to the presence or absence of co-morbid anxiety was significant, $\chi^2 = 5.91$, $df = 2$, $P < 0.05$, with 67% of participants correctly classified to the groups with *versus* without co-morbid anxiety. The association of severe sexual abuse to anxiety co-morbidity was significant, $OR = 1.99$, $P < 0.05$, such that those with sexual abuse were twice as likely to be diagnosed with anxiety co-morbidity than those without. By contrast, no evidence was found for a significant association between poor care and anxiety co-morbidity in this multivariate model, $OR = 1.14$, $P = 0.25$. Therefore, not only did we find that severe sexual abuse was preferentially associated with co-morbid anxiety, but it also emerged as most strongly associated with co-morbid anxiety in this multivariate model.²

The relation of adversity to specific anxiety disorder diagnoses

Follow-up logistic regression analyses were conducted to determine which anxiety diagnoses were most strongly associated with sexual abuse

Table 4. *Logistic regression models examining relationship of childhood adversity factors to particular co-morbid anxiety disorders*

Co-morbid disorder	OR	Wald	P
PTSD			
Sexual abuse	2.46	6.06	0.01
Poor care	1.46	2.13	0.14
Panic disorder			
Sexual abuse	1.76	3.08	0.08
Poor care	0.69	0.48	0.49
Social phobia			
Sexual abuse	0.70	0.49	0.48
Poor care	0.13	0.018	0.89

and poor care (see Table 4). The model examining co-morbid PTSD was significant, $\chi^2 = 9.85$, $df = 2$, $P < 0.01$, correctly classifying 79% of women to groups with *versus* without PTSD. As demonstrated in Table 4, the odds of being diagnosed with co-morbid PTSD were 2.5 times higher among those with severe sexual abuse than among those without, 35% (12/34) of those with severe sexual abuse were diagnosed with PTSD *versus* only 10% (4/42) of those without. Thirty per cent (10/33) of those with poor care were diagnosed with PTSD *versus* 14% (6/43) of those without.

The logistic regression model testing the relation of sexual abuse and poor care to co-morbid panic disorder was not significant, $\chi^2 = 4.04$, $df = 2$, $P = 0.13$. Nevertheless, the odds of being diagnosed with co-morbid panic disorder were 1.75 times higher among those with severe sexual abuse than among those without, and more than twice as many (32% (11/34)) of those with sexual abuse were diagnosed with panic disorder than those without (14% (6/42)). By contrast, the effect of poor care on panic disorder

was very weak, and 27% (9/33) of those with poor care were diagnosed with panic disorder *versus* 19% (8/43) of those without.

Finally, no evidence was found for a significant association of either sexual abuse or poor care to co-morbid social phobia, $\chi^2 = 0.541$, $df = 4$, $P = 0.76$. Twenty per cent (7/34) of those with sexual abuse were diagnosed with social phobia *versus* 14% (6/42) without and 18% (6/33) of those with poor care with diagnosed with social phobia *versus* 16% (7/43) of those without.

Sexual abuse perpetrator and anxiety *versus* dysthymia co-morbidity

We performed two follow-up logistic regression analyses to examine whether specificity emerged in the association of sexual abuse to anxiety disorder *versus* dysthymia co-morbidity depending upon the relationship of the perpetrator to the victim. Participants who reported sexual abuse were grouped into those whose abuse was perpetrated by: (a) a related household member (father ($N = 5$), or stepfather ($N = 2$)); (b) a related non-household member (cousin ($N = 4$) or uncle ($N = 2$)); or (c) a non-related perpetrator (stranger ($N = 12$), family friend ($N = 4$), or peer ($N = 8$)). It should be noted that the cell sizes for these analyses are small. Therefore, they are meant to be primarily descriptive in nature.

The association between sexual abuse perpetrator and co-morbid anxiety was significant, $\chi^2 = 7.59$, $df = 3$, $P = 0.05$, with 67% of participants correctly classified to groups with *versus* without anxiety co-morbidity (see Table 5). Follow-up orthogonal contrasts revealed that those with no sexual abuse were significantly less likely to be diagnosed with a co-morbid anxiety

Table 5. *Logistic regression models examining relationship of sexual abuse perpetrator to anxiety and dysthymia co-morbidity*

Sexual abuse perpetrator	OR	Wald	P
Co-morbid anxiety		7.05	0.07
(a) no abuse v. household related, non-household related, and non-related perpetrator	2.64	6.99	0.008
(b) household related v. non-household related and non-related perpetrator	0.03	0.001	0.978
(c) non-household related v. non-related perpetrator	0.90	0.81	0.37
Co-morbid dysthymia		6.95	0.07
(a) household related v. no abuse, non-household related, and non-related perpetrator	2.16	4.71	0.03
(b) no abuse v. non-household related and non-related perpetrator	1.76	3.10	0.08
(c) non-household related v. non-related perpetrator	0.20	0.04	0.84

disorder (23%, 9/39) than all other groups who reported sexual abuse, regardless of perpetrator (see Table 5). By contrast, no significant differences emerged among those whose abuse was perpetrated by a related household member (57%, 4/7), a related non-household member (67%, 4/6), or a non-related perpetrator (46%, 11/24).

While no evidence was found for a significant overall relationship between sexual abuse and co-morbid dysthymia, the association of sexual abuse perpetrator to co-morbid dysthymia was significant, $\chi^2 = 7.90$, $df = 3$, $P < 0.05$, with 76% of participants correctly classified to groups with *versus* without co-morbid dysthymia. This effect was primarily accounted for by the finding that those whose abuse was perpetrated by a related household member were significantly more likely to be diagnosed with co-morbid dysthymia than all other groups. Specifically, 71% (5/7) of those whose abuse was perpetrated by a related household member were diagnosed with co-morbid dysthymia *versus* only 33% (2/6) of those whose abuse was perpetrated by a relative outside of the household, 29% (7/24) of those whose abuse was perpetrated by a non-relative, and 17% (7/39) of those with no sexual abuse. The latter three groups did not differ significantly in the proportion diagnosed with co-morbid dysthymia.

DISCUSSION

The primary goal of the present study was to examine specificity in the relation of adverse childhood experience to anxiety *versus* dysthymia co-morbidity in MDD. Severe sexual abuse and psychological abuse were significantly and preferentially associated with the presence of a co-morbid anxiety disorder, while severe physical abuse was significantly and preferentially associated with the presence of co-morbid dysthymia. In addition, significant associations emerged between severe antipathy and indifference and both co-morbid anxiety and co-morbid dysthymia. These results are consistent with previous research by Brown *et al.* (1993) documenting an increased rate of co-morbid anxiety and depression *versus* MDD alone among those endorsing 'childhood adversity', an index made up of severe physical abuse

and/or sexual abuse and/or indifference. In addition, we extended this area of research by supporting a greater role of adverse childhood experience in co-morbid dysthymia and MDD (i.e. 'Double Depression') *versus* MDD alone. As such, the present results add to a growing literature relating anxiety and dysthymia co-morbidity to a wide range of risk factors, including disrupted personality (Klein *et al.* 1988), family history of depression (Coryell *et al.* 1988; Klein *et al.* 1988) and greater disability or maladjustment (Leader & Klein, 1996; Roy-Byrne, 1996).

In multivariate analyses, severe sexual abuse was a stronger predictor of co-morbid anxiety than the 'poor care' index, a composite of severe antipathy, indifference, and psychological abuse. This finding extends previous research by supporting a differential contribution of specific adverse experiences to anxiety co-morbidity in MDD. Severe sexual abuse is often an unpredictable, uncontrollable, and inescapable event that is consistent with themes of danger and helplessness. Such events have been found in both animal models and studies with humans to predict the development of hyperarousal, hypervigilance and fear (Rosen & Schulkin, 1998). Therefore, it is consistent to find sexual abuse here significantly associated with co-morbid anxiety disorders and post-traumatic stress disorder, in particular.

By contrast, the relation of sexual abuse to co-morbid dysthymia was dependent upon the perpetrator. Those whose sexual abuse was perpetrated by a stranger or someone else outside the household were not significantly more likely to report co-morbid dysthymia than those with no sexual abuse. However, co-morbid dysthymia was present in 5/7 (71%) of those whose sexual abuse was perpetrated by a father or stepfather. These results suggest that sexual abuse perpetrated by a close relative, in addition to evoking themes of danger and helplessness, may also lead to the development of chronic low self-worth consistent with a diagnosis of dysthymia. By contrast, sexual abuse perpetrated by someone outside the household may not have as chronically depressogenic consequences to self-esteem. However, it should be noted that these analyses were based on small cell sizes and, thus, should be interpreted with caution. Future studies specifically designed to examine the

relation of sexual abuse perpetrator to anxiety *versus* dysthymia is required to confirm these findings.

Severe physical abuse also appears, on the face of it, to be an unpredictable, inescapable, and uncontrollable event that should be associated with co-morbid anxiety. However, we found that, contrary to hypotheses, physical abuse was significantly and preferentially associated with co-morbid dysthymia. Severe physical abuse in this sample overlapped highly with the experience of parental antipathy and indifference. Therefore, it is not surprising that this combination of low positive regard, criticism, emotional neglect and harsh physical punishment was associated with chronic worthlessness and dysphoria. Because the majority of the incidents of physical abuse reported by women in the present sample were meted out as punishments for breaking rules, perhaps these experiences were more predictable and, thus, less anxiogenic, than participants' sexual abuse experiences.

Further research investigating the mediators and moderators of the specific associations of adverse childhood experience to anxiety *versus* dysthymia co-morbidity is necessary in order to characterize more completely the nature of these relations. Beck's (Clark & Beck, 1998) cognitive theory of depression proposes that adverse childhood experiences lead to the development of negative core beliefs about the self, world and future. Therefore, unpredictable and uncontrollable experiences of sexual abuse may lead to core beliefs that the world is a dangerous place and that the self is helpless. These beliefs may then mediate the development of anxiety disorders, such as panic disorder or PTSD. By contrast, experiences of emotional neglect coupled with harsh criticism and punishment may lead to core beliefs that the self is unlovable and the future is hopeless. These beliefs may then mediate the development of chronic dysthymia. For example, Parker *et al.* (2000) found evidence for specificity between childhood abuse and cognitive schemas related to threat and lack of security, while childhood experiences of loss were associated with cognitive schemas related to abandonment, worthlessness and failure. The results of the present study add to this literature by suggesting that particular experiences in childhood set the stage for differences in syndromal expression.

The present study is limited in that it did not include a group with pure anxiety disorders. Previous studies have found higher rates of childhood abuse and neglect in patients with anxiety disorders *versus* matched controls (Stein *et al.* 1996; Young *et al.* 1997). In addition, the results of Brown and colleagues suggest that their childhood adversity index appears to be more strongly associated with depression and anxiety co-morbidity than with either diagnosis alone (Brown & Harris, 1993). Future research is now needed to test in a more fine-grained way which specific types of childhood adversity are most strongly associated with specific anxiety and depressive disorder diagnoses. In addition, longitudinal studies are required to chart in more detail the temporal evolution of psychopathology following adverse childhood experience. Such studies could also investigate a reverse casual relationship; that is, children with pre-existing psychopathology may be more vulnerable to neglect and abuse than healthy children.

A further limitation of the present study is that it was based on a volunteer sample of women and, therefore, results may not generalize to men or to patient samples. However, HRSD scores of the present participants were comparable to those reported in most out-patient samples in the literature. In addition, more than half of the sample was currently receiving out-patient treatment in the community, and no differences were noted on any study variables between this subsample and those not receiving treatment.

Due to this study's retrospective design, biases are possible in the recall of childhood experience, especially as all participants were currently depressed. The CECA addresses this concern more rigorously than do self-report questionnaires because respondents are probed during the interview about potentially neglected positive information. Furthermore, ratings of childhood adversity are made by judges who are unaware of co-morbid diagnoses. Nevertheless, prospective studies in children with documented abuse and/or neglect are required to further confirm the present findings.

Finally, previous studies have linked childhood abuse and neglect to other disorders, most notably substance abuse (Bensley *et al.* 1999), eating disorders (Neumark-Sztainer *et al.* 2000)

and personality disorders (Johnson *et al.* 1999). These disorders were not assessed in the present study as it was designed to focus exclusively on anxiety and dysthymia co-morbidity. Therefore, future studies with larger samples are required to investigate the relation of adverse childhood experiences to more complex patterns of co-morbidity.

The present project also had a number of methodological and theoretical strengths, including the use of structured interviews to establish DSM-IV diagnoses and a state-of-the-art contextual interview and rating system to assess childhood experience. Furthermore, because participants were volunteers from the community, as opposed to being drawn from treatment settings that often exclude individuals with co-morbid diagnoses, this group may represent a more naturalistic sample of individuals with MDD as they present in the real world. Finally, this study examined the multivariate associations of various childhood experiences to both anxiety and dysthymia co-morbidity. The results obtained have potentially important implications as they suggest that even subtle differences in childhood environmental experience can translate into significant differences in adult syndromal expression.

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NOTES

- ¹ Participants were excluded at the phone screen because they did not meet criteria for major depression ($N = 80$), their depression was chronic ($N = 48$), or they had a co-morbid exclusionary diagnosis ($N = 27$).
- ² The results of this analysis did not change when severe physical abuse was included in the poor care composite.

REFERENCES

- Alnæs, R. & Torgersen, S. (1990). Parental representation in patients with major depression, anxiety disorder and mixed conditions. *Acta Psychiatrica Scandinavica* **81**, 518–522.
- American Psychiatric Association (1994). *Diagnostic and Statistical Manual of Mental Disorder, 4th edn*. APA: Washington, DC.
- Beck, A. T. (1976). *Cognitive Therapy and the Emotional Disorders*. International Universities Press: New York.
- Beck, A. T. & Steer, R. A. (1987). *Manual for the Revised Beck Depression Inventory*. Psychological Corporation: San Antonio, TX.
- Beck, A. T., Steer, R. A. & Garbin, M. G. (1988). Psychometric properties of the Beck Depression Inventory: twenty-five years of evaluation. *Clinical Psychology Review* **8**, 77–100.
- Beitchman, J. H., Zucker, K. J., Hood, J. E., daCosta, G. A. & Akman, D. (1991). A review of the short-term effects of child sexual abuse. *Child Abuse and Neglect* **15**, 537–556.
- Bensley, L. S., Spieker, S. J., Van Eenwyk, J. & Schoder, J. (1999). Self-reported abuse history and adolescent problem behaviors. II. Alcohol and drug use. *Journal of Adolescent Health* **24**, 173–180.
- Bifulco, A., Brown, G. W. & Adler, Z. (1991). Early sexual abuse and clinical depression in adult life. *British Journal of Psychiatry* **159**, 115–122.
- Bifulco, A., Brown, G. W. & Harris, T. O. (1994). Childhood Experience of Care and Abuse (CECA): a retrospective interview measure. *Journal of Child Psychology and Psychiatry* **35**, 1419–1435.
- Brewin, C. R., Andrews, B. & Gotlib, I. H. (1993). Psychopathology and early experience: a reappraisal of retrospective reports. *Psychological Bulletin* **113**, 82–98.
- Brown, G. W. & Harris, T. O. (1993). Aetiology of anxiety and depressive disorders in an inner-city population. 1. Early adversity. *Psychological Medicine* **23**, 143–154.
- Brown, G. W., Harris, T. O. & Eales, M. J. (1993). Aetiology of anxiety and depressive disorders in an inner-city population. 2. Comorbidity and adversity. *Psychological Medicine* **23**, 155–165.
- Brown, G. W., Harris, T. O., Hepworth, C. & Robinson, R. (1994). Clinical and psychosocial origins of chronic depressive episodes II. A patient enquiry. *British Journal of Psychiatry* **165**, 457–465.
- Brown, G. W., Harris, T. O. & Eales, M. J. (1996). Social factors and comorbidity of depressive and anxiety disorders. *British Journal of Psychiatry* **168** (suppl. 30), 50–57.
- Brown, T. A., Campbell, L. A., Lehman, C. L., Grisham, J. R. & Mancill, R. B. (2001). Current and lifetime comorbidity of the DSM-IV anxiety and mood disorders in a large clinical sample. *Journal of Abnormal Psychology* **110**, 585–599.
- Clark, D. A. & Beck, A. T. (1998). *Scientific Foundations of Cognitive Theory and Therapy of Depression*. Wiley: New York.
- Clark, D. A., Beck, A. T. & Stewart, B. (1990). Cognitive specificity and positive-negative affectivity: complementary or contradictory views on anxiety and depression? *Journal of Abnormal Psychology* **99**, 148–155.
- Coryell, W., Endicott, J., Andreasen, N. C., Keller, M. B., Clayton, P. G., Hirschfeld, R. M. A., Scheftner, W. A. & Winokur, G. (1988). Depression and panic attacks: the significance of overlap as reflected in follow-up and family study data. *American Journal of Psychiatry* **145**, 293–300.
- DiNardo, P. & Barlow, D. (1990). Syndrome and symptom co-occurrence in the anxiety disorders. In *Comorbidity of Mood and Anxiety Disorders* (ed. J. Maser and C. R. Cloninger), pp. 205–230. American Psychiatric Press: Washington, DC.
- First, M. B., Spitzer, R. L., Gibbon, M. & Williams, J. B. W. (1995). *Structured Clinical Interview for DSM-IV Axis I Disorders*. Biometrics Research Department, New York State Psychiatric Institute.
- Grove, W., Andreasen, N., McDonald-Scott, P., Keller, M. & Shapiro, R. (1981). Reliability studies of psychiatric diagnosis. *Archives of General Psychiatry* **38**, 408–413.

- Hamilton, M. (1960). A rating scale for depression. *Journal of Neurology, Neurosurgery and Psychiatry* **23**, 56–62.
- Harkness, K. L. & Luther, J. (2001). Clinical risk factors for the generation of life events in major depression. *Journal of Abnormal Psychology* **110**, 564–572.
- Johnson, J. G., Cohen, P., Brown, J., Smailes, E. M. & Bernstein, D. P. (1999). Childhood maltreatment increases risk for personality disorders during early adulthood. *Archives of General Psychiatry* **56**, 600–606.
- Keller, M. B. & Shapiro, R. W. (1982). 'Double depression': superimposition of acute depressive episodes on chronic depressive disorders. *American Journal of Psychiatry* **139**, 438–442.
- Keller, M. B., Lavori, P. W., Endicott, J., Coryell, W. & Klerman, G. L. (1983a). 'Double depression': a two-year follow-up. *American Journal of Psychiatry* **140**, 689–694.
- Keller, M. B., Lavori, P. W., Lewis, C. E. & Klerman, G. L. (1983b). Predictors of relapse in major depressive disorder. *Journal of the American Medical Association* **250**, 3299–3304.
- Kessler, R. C., Nelson, C. B., McGonagle, K. A., Liu, J., Swartz, J. & Blazer, D. G. (1996). Comorbidity of DSM-III-R major depressive disorder in the general population: results from the US National Comorbidity Study. *British Journal of Psychiatry* **168** (suppl. 30), 17–30.
- Klein, D. N., Taylor, E. B., Harding, K. & Dickstein, S. (1988). Double depression and episodic major depression: demographic, clinical, familial, personality, and socioenvironmental characteristics and short-term outcome. *American Journal of Psychiatry* **145**, 1226–1231.
- Leader, J. B. & Klein, D. N. (1996). Social adjustment in dysthymia, double depression and episodic major depression. *Journal of Affective Disorders* **37**, 91–101.
- Levitt, A. J., Joffe, R. T. & MacDonald, C. (1991). Life course of depressive illness and characteristics of current episode in patients with double depression. *Journal of Nervous and Mental Disease* **179**, 678–682.
- Lizardi, H., Klein, D. N., Ouimette, P. C., Riso, L. P., Anderson, R. L. & Donaldson, S. K. (1995). Reports of the childhood home environment in early-onset dysthymia and episodic major depression. *Journal of Abnormal Psychology* **104**, 132–139.
- Mancini, C., Van Ameringen, M. & MacMillan, H. (1995). Relationship of childhood sexual and physical abuse to anxiety disorders. *Journal of Nervous and Mental Disease* **183**, 309–314.
- Molnar, B. E., Buka, S. L. & Kessler, R. C. (2001). Child sexual abuse and subsequent psychopathology: results from the National Comorbidity Survey. *American Journal of Public Health* **91**, 753–760.
- Neumark-Sztainer, D., Story, M., Hannan, P. J., Beuhring, T. & Resnick, M. D. (2000). Disordered eating among adolescents: associations with sexual/physical abuse and other familial/psychosocial factors. *International Journal of Eating Disorders* **28**, 249–258.
- Parker, G., Gladstone, G., Mitchell, P., Wilhelm, K. & Roy, K. (2000). Do early adverse experiences establish a cognitive vulnerability to depression on exposure to mirroring life events in adulthood? *Journal of Affective Disorders* **57**, 209–215.
- Rehm, L. P. & O'Hara, M. W. (1985). Item characteristics of the Hamilton Rating Scale for Depression. *Journal of Psychiatric Research* **19**, 31–41.
- Rosen, J. B. & Schulkin, J. (1998). From normal fear to pathological anxiety. *Psychological Review* **105**, 325–350.
- Roy-Byrne, P. P. (1996). Generalized anxiety and mixed anxiety-depression: association with disability and health care utilization. *Journal of Clinical Psychiatry* **57**, 86–91.
- Sherbourne, C. D. & Wells, K. B. (1997). Course of depression in patients with comorbid anxiety disorders. *Journals of Affective Disorders* **43**, 245–250.
- Simons, A. D. & Thase, M. E. (1992). Biological markers, treatment outcome, and 1-year follow-up in endogenous depression: electroencephalographic sleep studies and response to cognitive therapy. *Journal of Consulting and Clinical Psychology* **60**, 392–401.
- Stein, M. B., Walker, J. R., Anderson, G., Hazen, A. L., Ross, C. A., Eldridge, G. & Forde, D. R. (1996). Childhood physical and sexual abuse in patients with anxiety disorders and in a community sample. *American Journal of Psychiatry* **153**, 275–277.
- Young, E. A., Abelson, J. L., Curtis, G. C. & Nesse, R. M. (1997). Childhood adversity and vulnerability to mood and anxiety disorders. *Depression and Anxiety* **5**, 66–72.
- Zung, W. W., Magruder-Habib, K., Velez, R. & Alling, W. (1990). The comorbidity of anxiety and depression in general medical patients: a longitudinal study. *Journal of Clinical Psychiatry* **51** (suppl. 6), 77–80.