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Negative Life Events in Childhood, Psychological Problems and Suicide Attempts in Adulthood: A Matched Case-Control Study

Gudrun Dieserud,[1] Lisa Forsén,[1]
Marc T. Braverman,[2] and Espen Røysamb[1]
[1]National Institute of Public Health, Oslo, Norway
[2]University of California, Davis, USA

The purpose of the study was to investigate relations between childhood negative life events (parental loss, parental mental illness and parental abuse), adult psychological problems (depression, hopelessness, low self-esteem, low self-appraised problem-solving capacity, and alcohol problems) and suicidal behavior. A matched case control design was applied (total N = 321). Risk of suicide attempt was found to be related to childhood negative life events as well as to psychological problems of adulthood. Moreover, the effects of childhood events were found to be partially mediated through the psychological problems, and gender-specific risk pathways were identified. For men, the central pathway involved parental mental illness during childhood and low self-esteem in adulthood. For women, childhood abuse, adulthood depression and alcohol problems appeared to constitute central factors. Additionally, effects were found for previous suicide attempts.

Keywords suicide attempt, family dysfunction, self-esteem, depression, alcohol problems

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Address correspondence to Psykolog Gudrun Dieserud, Department of Population Health Sciences, National Institute of Public Health, P.O. Box 4404 Torshov, N-0403, Oslo, Norway. E-mail: gudrun.dieserud@baerum.kommune.no

The increases in suicidal behavior among children and adolescents in many countries during the last three decades (Beautrais, Joyce & Mulder, 1996; Grøholt, Ekeberg, Wichstrøm & Haldorsen, 1998) have heightened the urgency of identifying critical early risk factors for suicidal behavior. One area of research focus has been on different aspects of family functioning, including the experience of significant negative events during childhood. In particular, there are indications that variables suggesting upheaval or dysfunction in parental care—such as loss of nearest caretaker, poor child-parent relationships, a history of abuse, or psychopathology among first degree relatives—can often distinguish child and adolescent suicide attempters from normal or clinical controls (Adam, 1990; Brent et al., 1994; Lester, 1992; Martin, 1996; Pfeffer, Normandin & Kakuma, 1994; Wagner, 1997). However, the evidence is not conclusive (Yang & Clum, 1996). Different studies have reported wide variations in the strength of the relationship between childhood negative life events and subsequent suicidal behavior (Lester, 1992), and in a recent comprehensive review, Wagner (1997) concluded that there was very little firm empirical evidence for most of the family-level factors.

There are several possible reasons for the inconsistencies found thus far in the research on childhood negative life events and later suicidal behavior. One consideration is that few studies have sought to identify and include psychological factors that might be functioning as mediating variables (Adam, 1990; Harris & Brown, 1996; Kwon & Oei, 1994; Lester, 1992; Weishaar & Beck, 1990). A second is that studies on family risk factors for suicidal behavior have, to a large degree, been conducted on child or adolescent suicide attempters. As a result they have not been able to demonstrate clearly that the proposed early risk factors precede—rather than co-occur with or follow—the suicidal symptoms (Wagner, 1997). A further consideration is that differences may exist in these relationships based on gender (Lester, 1992), which could complicate attempts at explanation if this variable is not explicitly accounted for. The present study sought to address these concerns in an examination of mediational models linking specific negative childhood events with later suicidal behavior.

A special focus within research on family risk factors for suicidal behavior has been the association between early loss of a caretaker and later depression and suicidal behavior (Adam, 1990). The loss of an attachment figure during childhood, for example through death, separation, divorce, or placement outside the home, has been associated with later suicidal behavior, especially if there is a combination of losses, as when death of a parent leads to other major disruptions in the home (Wagner, 1997). There seems to be modest support for effects from parental loss by death alone. However, some of the results are difficult to interpret due to methodological difficulties such as lack of adequate control groups, unclear definition of parental loss, and unclear inclusion criteria for the study groups (Adam, 1990; Wagner, 1997). Furthermore, factors such as parental alcoholism, psychopathology in first-degree relatives, and physical, emotional or sexual abuse during childhood have been found to be related to suicidal behavior (Adam, 1990; Beautrais et al., 1996; Brent et al., 1994; Coll, Law, Tobias & Hawton, 1998; Linehan, 1993; Martin, 1996; Moscicki, 1995; Pfeffer et al., 1994; Stepakoff, 1998; Ussher & Dewberry, 1995; Wagner, 1997).

Nevertheless, the role of specific life events in the development of risk for suicidality continues to be a controversial matter (Adam, 1990). One way of strengthening the theoretical perspectives would be to examine several life events in combination, instead of investigating each family

factor singly (Wagner, 1997). Another research issue of importance is to establish that these family risk factors actually precede the suicidal symptoms investigated (Wagner, 1997). Furthermore, an issue that has attracted little attention within research on negative life events and suicidality is the possibility that different life events might have different impacts on women and men. Wagner (1997) reveals that almost no focus has been placed on interactions between gender and different categories of negative life events. The gender paradox that males commit suicide more often than females, while females attempt suicide more often than males has been addressed in multidisciplinary research from different parts of the world (Canetto & Sakinofsky, 1998; de Man & Leduc, 1995), but there has been little research attention to the possibility of gender differences in the relative impact of specific negative life events during childhood.

With regard to psychological factors of adulthood that are associated with, and potentially causally related to, suicidal behavior, several constructs have been investigated in previous studies. It is well established that depression constitutes a major factor in the development of a suicidal crisis (Fremouw, de Perczel & Ellis, 1990), but depression per se is not a sufficient condition for suicidal behavior (Ahrens & Linden, 1996; Dieserud, Røysamb, Ekeberg & Kraft, in press; Leenaars, 1996; Shneidman, 1985). Hopelessness has been identified as probably the most important mediating variable between depression and suicidality. However, the etiological relationship between depression, hopelessness, and other putative risk factors is not clear (Dieserud et al., in press; Weishaar & Beck, 1990). Low self-esteem generally ranks among the strongest predictors of emotional and behavioral problems (Leary, Schreindorfer & Haupt, 1995), and measures of negative self-evaluation have been identified as key mediating factors in the observed relationships among negative life stress, depression, hopelessness and suicidal behavior (Overholser, Adams, Lehnert & Brinkman, 1995; Weishaar & Beck, 1990). On the other hand, people with high self-esteem may be protected from becoming depressed, hopeless, or suicidal, despite experiencing negative life events.

An additional, important area of psychological functioning is problem-solving. Several aspects of problem-solving deficits have been found to discriminate suicide attempters from psychiatric patients with no history of suicidal behavior, as well as from nonpatient controls (Adams & Adams, 1996; Dieserud et al., in press; Linehan, Camper, Chiles, Strosahl & Shearin, 1987; McLeavey, Daly, Murray, O'Riordan & Taylor, 1987; Orbach, Bar-Joseph & Dror, 1990; Pollock & Williams, 1998; Priester & Clum, 1993; Schotte & Clum, 1987; Weishaar & Beck, 1990). Within this area, one potentially important mediating variable between negative life events and suicidal behavior would be assessment of one's own effectiveness in problem-solving and coping with life's challenges (Bonner & Rich, 1988; Heppner & Anderson, 1985; Heppner, Baumgardner & Jackson, 1985; Heppner & Petersen, 1982). Finally, another variable that plays a major role in suicidal behavior is alcohol abuse (Lester, 1992; Moscicki, 1995; Rossow & Wichstrøm, 1994), and this might also constitute a strong mediating factor linking childhood experiences with subsequent suicidal behavior.

In summary, suicidal behavior has been studied in relation to both negative life events during childhood, and to psychological and social problems in adulthood. However, insufficient attention has been paid to the interrelation between these two broad categories of predictors, and relatively little is known about the possible mechanisms of influence that may link these variables. Psychological problems

such as depression, low self-esteem, and self-appraised low problem-solving capacity constitute potential candidates as mediators of the effect of life events on suicidality. In addition, insufficient attention has been paid to possible gender differences in relation to effects on suicidality from several categories of childhood negative life events. Thus, there is still a strong need for empirical studies integrating childhood life events and adult psychological problems into a more comprehensive model in which both direct and mediational effects are taken into account.

With regard to methodological problems in suicide research, generally there is a lack of studies on clinical samples using case-control design (Leenaars et al., 1997; Lester, 1992; Smith & Maris, 1995), where cases are based on a clear definition of the specific behavior being investigated (O'Carroll et al., 1996; Leenaars et al., 1997; Smith & Maris, 1995). Few studies have collected data by means of structured research interviews (Adam, 1990), or utilized multivariate methods to analyze the possible mutual influence of separate risk factors on the development of suicidality, including both distal and mediating relations among variables (Dixon, Heppner, Burnett, Anderson & Wood, 1993). More specifically, within research on negative childhood life events and subsequent suicidal behavior, commentators have underscored the importance of securing the temporal sequencing of family risk factors, examining the co-occurrence of risk factors rather than studying them in isolation, and finally, conducting comparisons of several models of prediction (Adam, 1990; Wagner, 1997).

In light of these issues, the present study was undertaken to investigate the relationships among childhood negative life events, possible mediating psychological variables, and suicidal behavior, through a comparison of suicide attempters with a nonclinical control group matched for age, sex, and geographical residency. The specific aims of the study were to answer the following research questions:

1. To what extent do negative life events during childhood have an effect on adult suicidal behavior?
2. To what extent are the effects of negative life events mediated through individual psychological variables such as depression, hopelessness, self-esteem, self-appraised problem-solving capacity, and alcohol problems?
3. Are there gender specific ways in which childhood negative life events affect adult suicidal behavior?

METHOD

Cases

Patients who participated in this study were from Asker and Bærum, two neighboring municipalities to Oslo, Norway. Consecutive patients (unselected) admitted to the local general hospital after a suicide attempt between January 1, 1995 and January 31, 1996, were asked by a social worker or a psychiatrist to participate in the study. Informed written consent was obtained. Our inclusion criteria were in accordance with the definition of parasuicide used by the WHO/Euro Multicentre Study on Parasuicide: "An act with nonfatal outcome, in which an individual deliberately initiates a non-habitual behaviour that, without intervention from others, will cause self-harm, or deliberately ingests a substance in excess of the prescribed or generally recognized therapeutic dosage, and which is aimed at realizing changes which the subject desired via the actual or expected physical consequences" (Platt et al., 1992). Of the 100 admissions during the registration period, 31 subjects were excluded from the sample for one of the following reasons: a) age less than 18 years, b) psychosis, c) mental retardation, d) drug

addiction, e) foreigner with poor knowledge of the Norwegian language. Of the remaining 69 persons, 19 (27.5%) were excluded for noncompliance or failure to appear for the interview. Thus, 50 suicide attempters participated (response rate 72.5%). At the time of this suicide attempt, subjects ranged in age from 18 to 75 (mean age = 41 years, 40 years for females and 43 years for males). Thirty-three (66%) were females and 17 (34%) were males. All cases except one (98%) involved self-poisoning behavior.

Procedure

After informed written consent was received, the subjects were phoned by one of the present authors (GD), and an appointment for an interview was made. All interviews were conducted by GD. Permission for the study was obtained from The Regional Ethical Board for Medical Research and The Data Inspectorate. The interviews followed a structured interview schedule, consisting of a major part of the interview guide used by the WHO/Euro Multicentre Study on parasuicide - EPSIS I, Version 5.1 (Kerkhof, Bernasco, Bille-Brahe, Platt & Schmidtke 1989; Norwegian version by the Norwegian WHO-center), as well as the Problem-Solving Inventory (Heppner & Petersen, 1982). The testing session lasted from 1 to 3 hours.

Controls

Controls were obtained by drawing eight subjects matched for sex, age, and area of residence, around each suicide attempter. Each control was matched to a same sex case who was within 1 year of the patient in age. A total of 400 persons were selected at random from the Population Registry of Norway, by the Norwegian Government Computer Center (SDS). Twenty respondents could not be reached because of incorrect addresses, because they were excluded in accordance with criteria (b)–(e) above for the suicide attempt group, or because they already belonged to the suicide attempt group. Data were collected by means of anonymous, self-completion questionnaires, mailed and followed by a reminder during spring 1998. A total of 271 persons (190 females and 81 males) returned the questionnaire, yielding a response rate of 71.3%. Subjects ranged in age from 18 to 77 (mean age = 39 years, 38 years for females and 44 years for males); 70% were females and 30% were males.

Measures

Childhood negative life events. Subjects' exposure to three critical categories of negative life events during childhood—parental loss, parental mental illness, and parental abuse—was assessed by a series of self-report items. Self-report strategies for measuring life events have been widely used in previous research on the development of psychopathology (see Adams & Adams, 1996; Johnson & Bradlyn, 1988; and Luthar & Cushing, 1994, for further details). In this study the measures were as follows:

Parental loss. The index was based on three items: (a) Death of one or both parents before the age of 15, (b) living apart from one or both parents for a year or more before the age of 15, and/or (c) being mainly raised by someone other than parents.

Parental mental illness (PMI). The index was based on one item: Admittance to inpatient treatment in psychiatric hospital for one or both parents, before the respondent was 15 years of age.

Parental abuse. The index was based on three items: (a) physical, (b) emotional, and/or (c) sexual abuse by a parent or

nearest caretaker (if raised by other than parents), before the age of 18. Emotional abuse was based on a self-definition of the item.

Behavioral measures. Alcohol problems. The index was based on two criteria: (a) Drinking alcohol at least weekly, plus (b) indicating that alcohol constitutes at least a minor problem in one's life.

Previous suicide attempts (PSA). The index was based on one item: Whether the respondent had engaged in previous suicide attempt(s) or not (scored in accordance with the WHO-definition), regardless of number of attempts.

The indices of childhood life events, previous suicide attempts and alcohol problems were all constructed in a dichotomous manner, categorizing respondents as either having or not having experienced the negative condition (scored as 1 or 0, respectively). For the multiple-item indices such as loss or abuse, a "yes" response to any of the items resulted in a scoring of 1.

Psychological measures. The Beck Depression Inventory (BDI) (Beck, Rush, Shaw & Emery, 1979) is comprised of 21 items that correspond to the cognitive, affective, motivational, and vegetative characteristics of depression. In each item, one of four statements is selected. Statements are ranked from 0–3, with 0 being the least serious and 3 representing the most serious depressive symptomatology. The English language version of the instrument has been demonstrated to have high internal consistency, and test-retest reliability for various populations has been very good (Fremouw et al., 1990). The Norwegian language version used in this study was developed by the Norwegian team of the WHO/Euro Multicentre Study on Parasuicide. The reliability (Cronbach's alpha) for this translated Norwegian version was .93.

Beck hopelessness scale (HS) (Beck, Weissman, Lester & Trexler, 1974) is comprised of 20 true-false items that assess the degree of pessimism or a person's negative view of the future. Nine of the items are keyed false and 11 true. The items are summed to obtain a total hopelessness score (range = 0–20) (Beck, Brown, Berchick, Stewart & Steer, 1990). The English language version of HS is, at this point, the most well researched instrument for the assessment of hopelessness, with strong internal reliability, and evidence of concurrent and construct validity across a variety of populations (Glanz, Haas & Sweeney, 1995). The reliability (Cronbach's alpha) for this translated Norwegian (by the Norwegian WHO/Euro team) version was .88.

Rosenberg's self-esteem scale (SES). (Kerkhof et al., 1989). The most often used measure of global self-esteem (Blasovich & Tomaka, 1991), is comprised of 10 items responded to on a four-point scale from (1) strongly agree, to (4) strongly disagree, resulting in a scale range of 10–40 with higher scores representing higher self-esteem. The English language version of the scale has shown relatively high internal consistency and test-retest reliability (Blasovich & Tomaka, 1991). The reliability (Cronbach's alpha) for this translated Norwegian (by the Norwegian WHO/Euro team) version was .92.

Problem solving inventory, form B (PSI) (Heppner, 1988) is comprised of 32 items measuring people's perceptions of their personal problem-solving behavior and attitudes. The inventory measures people's problem-solving orientation on a global level, apart from specific problems (Heppner & Petersen, 1982; Dixon et al., 1993). The English language version of the instrument appears to be relatively internally consistent and stable, and has demonstrated high test-retest reliability

(Dixon et al., 1993; Priester & Clum, 1993). The Norwegian version applied in this study is responded to on a 5-point scale ranging from (1) strongly agree to (5) strongly disagree. Low scores represent positive appraisal of one's own problem-solving abilities. The translation was created through back translation procedure (Okazaki & Sue, 1998), by a team of native English and native Norwegian speakers. The reliability (Cronbach's alpha) for this measure was .95.

During the data analysis phase of this research, the direction of scores on the PSI was reversed, in order to make high scores indicate assessment of oneself as a relatively effective problem solver.

Statistical Analyses

Basic analyses of internal reliability (Cronbach's alpha), mean scores and standard deviations were conducted. Our design—an M:N matched data set (SAS, 1995)—does not allow testing of differences between the groups, and thus the more advanced statistics are performed subsequently.

To investigate the interrelations between all the variables, correlation analyses were conducted. For the dichotomous variables, for which ordinary Pearson correlations would not be appropriate, polychoric correlations were used.

The association between negative life events during childhood and adult suicidal behavior, adjusting for other predictors, was analyzed by means of conditional logistic regression for M:N matched data (SAS, 1995). The calculated odds ratios were regarded as estimators for the corresponding relative risks (Gordis, 1996), since cases and controls were assumed to be representative for "cases" and "controls" in the population, respectively, and suicide attempt has a low prevalence in the population.

RESULTS

Table 1 shows descriptive statistics for the involved variables, for suicide attempters

TABLE 1. **Descriptive Statistics, Percentages, Mean Scores, and Standard Deviations**

	Suicide attempters (n = 50)		Normal controls (n = 271)	
Dichotomous variable	**Percentage scored as "1"**		**Percentage scored as "1"**	
Parental loss	40.0%		24.8%	
PMI[(a)]	18.0%		6.0%	
Parental abuse	46.0%		11.1%	
Previous attempt(s)	68.0%		7.1%	
Alcohol	12.0%		0.7%	
Scaled variables	**M**	**SD**	**M**	**SD**
Depression	19.4	(11.1)	5.1	(6.2)
Hopelessness	10.0	(5.6)	4.5	(3.8)
Self-esteem	23.4	(6.1)	32.2	(5.5)
Problem-solving	96.5	(27.7)	117.1	(17.6)

Note: Due to our M:N matched data set, ordinary testing of significance of differences between the groups (by means of t-test) would not be appropriate, and are thus not performed.
(1) [(a)]PMI = Parental mental illness.
(2) The dichotomous variables were scored 0 or 1, with 1 indicating presence of the condition.

and normal controls. As can be seen, for all nine variables, suicide attempters had more negative mean scores than normal controls. On the measures of negative life events during childhood (parental loss/parental mental illness/parental abuse), the largest differences between the groups were found in relation to having been physically, emotionally or sexually abused, or having experienced parental mental illness (PMI). That 12% of the suicide attempters reported alcohol problems, compared to 0.7% of the normal controls is also to be noted. Finally, suicide attempters scored higher on depression and hopelessness, and they scored lower on self-esteem and self-appraised problem-solving capacity, relative to normal controls. It is to be noted that hopelessness has been excluded from further analyses. As the initial significant effects from hopelessness on suicide attempt disappeared when depression was entered in the regression, and since we found no significant differences between the effects of hopelessness and those of depression with regard to adult suicide attempt, only the variable with the strongest effect on suicide attempt was kept.

Table 2 shows correlations between all the scales. Most correlations were significant, and varied from negligible to strong.

Depression (BDI), self appraised problem-solving capacity (PSI) and self-esteem (SES) were quite strongly interrelated, and these scales also yielded substantial correlations with suicide attempt. Moreover, the variables representing negative life events (parental loss/mental illness/abuse) were to some extent related to both suicide attempt and the psychological problems. The bivariate associations as indicated by these correlations are important in that they show relations between different groups of variables. However, in order to reveal to what extent the associations are due to relations within or between the two main groups (i.e., suicide attempters vs controls) more advanced analyses are required.

Thus, the final analyses involved testing the associations between negative life events in childhood and suicide attempt in adulthood, adjusted for other predictors

TABLE 2. **Correlations Between all Involved Variables. Upper Triangle Represents Females, Lower Triangle Represents Males**

	1	2	3	4	5	6	7	8	9
1. Parental loss[a]		.45*	.13	−.06	−.11	.12	−.12	−.18*	.09
2. Parental mental illness[a]	.14		.29	.14	−	.22	−.18	−.22	.20
3. Parental abuse[a]	.75*	−		.66*	.26	.49*	−.36*	−.17	.62*
4. Previous attempts[a]	.71*	.52*	.72*		.67*	.63*	−.54*	−.34*	.85*
5. Alcohol[a]	−	.41	.71*	.63*		.36*	−.43*	−.28	.70*
6. Depression	.45*	.24	.72*	.85*	.45*		−.71*	−.58*	.70*
7. Self-esteem	−.44*	−.32	−.57*	−.80*	−.44*	−.80*		.70*	−.63*
8. Problem solving	−.19	−.26	−.28	−.52*	−.13	−.67*	.80*		−.40*
9. Current attempt[b]	.51*	.59*	.54*	.84*	.58*	.78*	−.84*	−.51*	

*$p < 0.05$

Three polychoric correlations were not estimated (marked with '–'), due to the lack of responses at least one of the four cells of the 2×2 cross table.

Variables marked with[a]:

1 = Negative condition present.

0 = Negative condition absent.

Current attempt[b]:

1 = Clinical sample with current suicide attempt.

0 = Control sample.

(see Tables 3 and 4) by means of conditional logistic regression.

Women with Abuse = 1 had more than eight times higher risk of being a suicide attempter than women with Abuse = 0 (Table 3, column I). Correspondingly, men had more than six times higher risk (Table 4, column I). Men had also a five to six times higher risk when Loss = 1 or Parental mental illness (PMI) = 1, while these variables were not significant for women.

Looking at previous suicide attempt(s) (PSA), women with PSA = 1 had 25 times higher risk of being a present suicide attempter than women with PSA = 0, while for men the corresponding relative risk was 19. Women reporting present alcohol problems also had more than 24 times higher risk of being a suicide attempter than women reporting no such problems, while for males the risk was 10 times higher, but not significant. For all three psychological variables (Depression, Self-esteem, and self-appraised Problem-solving) the associations were significant for both sexes. For women with high scores on Depression, the risk of being a suicide attempter was three times higher than for women with a low score (the difference between high and low is one standard deviation—see Tables 3 and 4). The corresponding relative risk for men was almost four. Further, women with low scores on Self-esteem or self-appraised Problem-solving, had three (1/0.3) and two (1/0.5) times higher risk of being a suicide attempter respectively, while the corresponding relative risks for men were five (1/0.2) and more than two (1/0.4).

When the effects of each childhood negative life event were investigated, while controlling for the other childhood negative life events, only Abuse gave a significant effect on suicide attempt for women, still with eight times higher risk of being a suicide attempter with Abuse = 1. Parental mental illness (PMI) gave the only significant effect for males with eight times higher risk for being a suicide attempter with PMI = 1, than with PMI = 0 (Tables 3 and 4, column II).

When the effects of each of the psychological variables (Depression, Self-esteem and Problem-solving) were investigated, while controlling for the other variables, only Depression for women, and Self-esteem for men yielded significant effects. Women with high scores on BDI still had almost three times higher risk of being a suicide attempter than women with low scores on BDI. Men with low scores on Self-esteem had five (1/0.2) times higher risk of being a suicide attempter than men with high scores on Self-esteem (Tables 3 and 4, column III).

With adjustments for all significant variables in the tables, except for Previous suicide attempt(s) and Alcohol problems, Abuse and Depression still yielded significant effects on suicide attempt for women, as women with Abuse = 1 had more than four times higher risk of being a suicide attempter than women with Abuse = 0. Women with high scores on BDI still had more than doubled their risk for being a suicide attempter (Table 3, column IV). For men, only Self-esteem yielded a significant effect, as evidenced by the finding of a five (1/0.2) times higher risk of being a suicide attempter for men with low scores on Self-esteem than for men with high scores (Table 4, column IV).

Finally, the same pattern remained when also adjusting for Alcohol. The results for Alcohol showed the same tendency in column V as in column I for both women and men.

DISCUSSION

Three major issues were investigated in the present study: (1) Whether negative life events during childhood had an association with adult suicidal behavior, and if so, (2) the extent to which an effect was mediated through psychological and behavioral variables, and (3) whether there were any

TABLE 3. **Women. Conditional Logistic Regression Giving Relative Risks (RR[(1)]) and 95% Confidence Intervals (95% CI) for Different Potential Predictors of Suicide Attempt. (Significant Results in Bold)**

	I Unadjusted RR (95%CI)	II Adjusted for loss, neglect and abuse RR (95%CI)	III Adjusted for depression, self-esteem and problem solving RR (95%CI)	IV Adjusted for the significant variables in Col. II and III RR (95%CI)	V Adjusted for the variables in Col. IV and Alcohol RR (95%CI)
Parental loss	1.7 (0.7–3.7)	1.2 (0.5–3.1)			
PMI[(2)]	2.1 (0.6–6.9)	1.4 (0.3–5.9)			
Parental abuse	**8.4 (3.6–19.9)**	**8.1 (3.4–19.2)**		**4.3 (1.5–12.3)**	**4.9 (1.6–15.0)**
Alcohol problems	**24.3 (2.6–227.6)**				**30.6 (1.6–588.8)**
Previous suicide attempt[(3)]	**24.9 (9.8–63.2)**				
Depression[(4)]	**2.9 (2.0–4.2)**		**2.6 (1.5–4.3)**	**2.6 (1.8–3.7)**	**2.5 (1.7–3.6)**
Self-esteem[(4)]	**0.3 (0.2–0.5)**		0.6 (0.3–1.01)		
Problem solving[(4)]	**0.5 (0.3–0.8)**		1.3 (0.8–2.2)		

[(1)]The estimated odds ratios are regarded as relative risks.
[(2)]PMI = Parental mental illness.
[(3)]Previous suicide attempt is not included in the final model because it was highly correlated with current suicide attempt.
[(4)]For the three psychological variables, a difference of one standard deviation in normal controls (Table 1) is used in the computation of the association between the actual variable and suicide attempt.

TABLE 4. **Men. Conditional Logistic Regression Giving Relative Risks (RR[1]) and 95% Confidence Intervals (95% CI) for Different Potential Predictors of Suicide Attempt. (Significant Results in Bold)**

	I Unadjusted RR (95%CI)	II Adjusted for loss, neglect and abuse RR (95%CI)	III Adjusted for depression, self-esteem and problem solving RR (95%CI)	IV Adjusted for the significant variables in Col. II and III RR (95%CI)	V Adjusted for all variables in the table except previous suicide attempt RR (95%CI)
Parental loss	**5.4 (1.7–17.0)**	3.5 (0.8–14.4)			
PMI[2]	**6.1 (1.5–24.9)**	**8.0 (1.8–36.4)**		5.1 (0.7–37.3)	4.7 (0.6–37.0)
Parental abuse	**6.4 (1.5–27.3)**	4.5 (0.8–24.6)			
Alcohol problems	10.1 (0.8–131.7)				4.2 (0.2–83.9)
Previous suicide attempt[3]	**19.2 (5.0–74.6)**				
Depression[4]	**3.7 (1.9–6.5)**		1.6 (0.7–3.4)		
Self-esteem[4]	**0.2 (0.1–0.4)**		**0.2 (0.1–0.9)**	**0.2 (0.1–0.4)**	**0.2 (0.1–0.4)**
Problem solving[4]	**0.4 (0.2–0.6)**		1.5 (0.6–3.8)		

[1]The estimated odds ratios are regarded as relative risks.
[2]PMI = Parental mental illness.
[3]Previous suicide attempt is not included in the final model because it was highly correlated with current suicide attempt.
[4]For the three psychological variables, a difference of one standard deviation in normal controls (Table 1) is used in the computation of the association between the actual variable and suicide attempt.

gender specific effects. A sample of suicide attempters was compared with a sample of controls matched for age, sex and geographical residence.

In keeping with this study's first research question, childhood negative life events were indeed found to be predictive of adult suicidal behavior. When looking at women and men combined, differences between suicide attempters and normal controls were found with respect to parental loss, parental mental illness, and parental abuse. This finding can be interpreted as supportive of previous studies that found associations between several measures of parent-child discord and suicidal behavior among children, adolescents and young adults (Adam, 1990; Beautrais et al., 1996; Peters & Range, 1995; Silverman, Reinherz & Giaconia 1996; Yang & Clum, 1996). By investigating negative life events prior to the ages of 15 and 18 (for abuse) in a sample of adult suicide attempters, we have tried to address the major critique that has been raised as to whether the putative risk factors actually preceded the development of suicidal behavior (Wagner, 1997). The incidence of loss in the present sample of suicide attempters (40%) is very consistent with previous findings that 32–47% of various samples of suicide attempters had experienced permanent loss of a caretaker before the age of 15–18 (Adam, 1990). With regard to parental abuse and parental mental illness, the present findings are in keeping with general findings that suicide attempters were more likely than normal controls to have been abused by a parent, or to have experienced parental mental illness during childhood (Adam, 1990; Lester, 1992; Wagner, 1997). In summary, several measures of childhood negative life events yielded elevated risk for adult suicide attempt, and thus in general support previous findings of effects from childhood family dysfunction on adult suicidal behavior.

Further, from the first analysis, the finding of mean differences between suicide attempters and normal controls on the psychological variables we investigated (depression, hopelessness, self-esteem, and self-appraised problem-solving capacity) is in general supportive of previous research (Beck et al., 1979; Bonner & Rich, 1987; Maris, 1992; McLeavey et al., 1987; Overholser et al., 1995; Weishaar & Beck, 1990). The findings of differences between the groups on both alcohol problems and prior suicide attempts are in keeping with previous findings that alcohol abuse (Adam, 1990; Lester, 1992; Moscicki, 1995; Rossow & Wichstrøm, 1994) and previous suicide attempts (Garland & Zigler, 1993; Hjelmeland, 1996; Steer, Beck, Garrrison & Lester, 1988) constitute important predictors of subsequent suicidal behavior.

The notion of mediation (Baron & Kenny, 1986) is central to the interpretation of the present findings. Complete mediation is the case in which the initial variables no longer affect the outcome variable after the mediators have been controlled for. Partial mediation is the case in which the effect of the initial variables upon the outcome variable is reduced, but not completely eliminated. The statistical control is performed not with the aim of being able to disregard the effect of potential confounders, but rather to investigate and understand these intervening mechanisms and variables. The present results from the conditional logistic regression analyses suggest that childhood negative life events, psychological variables, and behavioral variables all contributed to risk of adult suicide attempt, and that the psychological variables mediated the effects of the negative life events. However, it is noteworthy that different risk pathways were indicated for women and men. For women, suicide risk was significantly related to physical, emotional and/or sexual abuse by parent or other nearest caretaker before the age of 18, as well as present alcohol problems, and being depressed.

However, when controlling for depression, the effect of abuse was reduced to approximately half the initial size, thus indicating a partial mediation of abuse through depression. It seems fair to conclude that one important risk pathway for women involves childhood events of abuse, potentially leading to adulthood depression which strongly influences risk of suicide attempt. This finding adds to the large body of previous research finding associations between childhood sexual, physical and/or emotional abuse and suicidal behavior among adult females (Boudewyn & Liem, 1995; Martin, 1996; Romans, Martin, Anderson, Herbison & Mullen, 1995; Silverman et al., 1996; Stepakoff, 1998; Ussher & Dewberry, 1995). Additionally, current alcohol problems were independently significant in predicting suicide attempt. The results indicated no mediation of abuse through alcohol problems. The finding of association between alcohol problems and suicidal behavior is well in keeping with previous research (mostly for both sexes combined) (Diekstra & Garnefski, 1995; Ekeberg, Ellingsen & Jacobsen, 1994; Lester, 1992; Moscicki, 1995; Rossow & Wichstrøm, 1994).

Thus, clinicians working with female suicide attempters should bear in mind the possibility of childhood sexual, physical or emotional abuse as potential distal risk factors for adult suicidal behavior. Similarly, they should also be aware of the potential risk related to current problems with alcohol and depression. Females having problems with alcohol had a 30 times higher risk for suicide attempt, relative to female controls, while no such elevated risk was found for men. This suggests that problems with alcohol might be associated with a higher degree of life stress among women than men, perhaps reflecting society's stronger disapproval of alcohol abuse by women than by men (Canetto & Sakinofsky, 1998).

For men, the final model showed that suicide risk was significantly related to self-esteem only. The initial significant effect from parental mental illness, when parental loss and parental abuse were statistically controlled, disappeared when the psychological variables were included in the regression analysis. This suggests that all significant effects from negative childhood life events were mediated through self-esteem, a finding that might be interpreted as being supportive of the prevailing empirical and clinical view of the important role of self-esteem in relation to depression and suicidality (Blasovich & Tomaka, 1991; Hammond & Romney, 1995; Leary et al., 1995; Oliver & Paull, 1995; Overholser et al., 1995; Weishaar & Beck, 1990). For males, the eight times higher risk of being a suicide attempter that was found to be associated with parental mental illness, when controlling for other childhood events only, is generally supportive of previous findings (mostly for both sexes combined) of associations between psychopathology in first-degree relatives and child and adolescent suicidal behavior (Moscicki, 1995; Shaffer, Garland, Gould, Fisher & Trautman, 1988; Wagner, 1997). This finding raises some interesting questions in relation to vulnerability. The effects of parental mental illness on children's general mental health, and on suicidal behavior in particular, may be through a shared biological vulnerability to mental disorder, through the learning of coping mechanisms that are characteristic of suicidal individuals, or through a shared family environment characterized by parental dysfunctional behavior, violence, abuse, or neglect (Lester, 1992; Moscicki, 1995; Valente, 1984; Wagner, 1997). Why boys should be more vulnerable to parental psychiatric illness than girls is a subject that deserves further investigation. For clinicians working with male suicide attempters, the importance of focusing on self-esteem is underscored.

In summary, the present study found gender specific pathways to suicide attempt. For females, the development of suicidality started with childhood physical, emotional or sexual abuse, followed by the development of depression. For males, the crucial risk pathway appeared to involve parental mental illness during childhood influencing the development of low self-esteem, which in turn strongly influenced the risk of suicide attempt.

Several issues concerning the methodological design of this study deserve attention. One is the validity of adult reports about childhood experiences. There is support for the accuracy of memories of discrete, stressful events in the family, compared with retrospective reports of subjectively evaluated variables characterizing the emotional climate in the family (Adam, 1990; Wagner, 1997). There is also research support for little influence on memory of key childhood adverse life events by mood state (Boudewyn & Liem, 1995). A second issue to be considered is that the study is cross-sectional, and thus cannot definitively establish causal links. However, by investigating associations between childhood experiences and adult suicidal behavior, the time difference between the two life experiences clearly implies a sequence of events that is consistent with a causal explanation. Other models of analyses might provide more knowledge of alternative mediation variables, for example the level of psychiatric disturbances other than depression, and although psychotic suicide attempters were excluded from participation in the present study, it would be of interest in future research studies to examine the mediating effect of borderline personality disorder on the relationship between childhood negative life events and adult suicidal behavior. Possible mediating effects of borderline personality disorder deserves further investigation since it has been related to findings of childhood sexual abuse for women as an important factor in the etiology of the disorder (Boudewyn & Liem, 1995; Linehan, 1993).

Well designed future studies on the relationship between childhood experiences and adult suicidal behavior are highly warranted in order to reach conclusive results regarding generalizability to other clinical samples. The investigation of associations between specific early risk factors and later suicidal behavior—along with the search for explanation of these effects through mediational relationships—can be of great importance in attempts to design effective interventions to prevent suicide and other mental health problems. In particular, such research can provide a basis for reducing the prevalence of operative risk mechanisms, as well as for strengthening protective mechanisms that can weaken the risk-outcome relationship. The search for complex mediational relationships—those which might account for either successful or unsuccessful developmental outcomes following the experience of negative life events in childhood—frames much of the current research on resilient children (e.g., Luthar & Zigler, 1991; Masten & Coatsworth, 1998; Werner, 1995). These children, who manage to attain successful developmental outcomes despite experiencing significant environmental risk factors or stressors, are generally found to benefit from a variety of protective factors that may exist at the level of the individual, family or community. A hallmark of the research on resilience is its ecological approach to a child's developmental context, that is, a recognition that risk and protective factors exist in complex mutual relationships within the individual's social environment. The focus on interaction implies that variables must be studied in combination with each other rather than in isolation. The work on resilience has substantial relevance to the area of suicide prevention, and has inspired a variety of intervention strategies that may involve

either the reduction of risk factors in the environment (primary prevention) or the identification and treatment of youth at heightened risk for suicidal behavior (secondary prevention) (Garland & Zigler, 1993).

In conclusion, the findings of the present study suggest that both childhood negative life events and current psychological and behavioral variables contribute significantly to risk for adult suicidal behavior. Further, the effects of negative life events appear to be mediated through the psychological variables, thus yielding indirect as well as direct effects on suicidal behavior. A final recommendation is that future research on childhood abuse and parental deprivation should bear in mind the distinct possibility of gender differences in the models that are developed.

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