

Suicidal ideation, suicide risk and aggressiveness: A comparative study of clinical and non-clinical participants

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This study investigated the relationship between different dimensions of aggressiveness in clinical and non-clinical participants. A non-clinical sample of 70 participants with and without suicidal ideations was compared with 68 psychiatric in-patients comprising first time suicide attempters and repeaters. Analyses of variance revealed that non-ideators exhibited less hopelessness than first time attempters and repeaters. Furthermore, with increasing suicide risk an increase of both auto-aggression and outwardly directed aggression was observed, going along with a dominance of auto-aggression over outward aggression in suicidal patients. The findings do not support the widely held hypothesis of a reversion of outwardly directed aggression to auto-aggression in suicide attempters.

Despite a large body of multidisciplinary studies, prediction of suicide risk, enabling prevention or early intervention, still appears to be difficult. Suicidal behavior is affected by a variety of factors such as unemployment, non-married status, low self-esteem, chronic physical pain, alcohol and drug abuse, lack of problem-solving skills, anxiety and depression. According to Beck, Kovacs, and Weissman (1975) and Beck, Steer, Kovacs, and Garrison (1985), hopelessness turned out to be one of the best predictors for suicide ideation, suicide attempts and completed suicides. More recent studies suggested that suicidal ideation plays a major role in the development of suicidal behavior (Rudd, 1990; Rudd, Joiner, & Rajab, 1996; Clum & Weaver, 1997). Ideation precedes planning, which may lead to a suicide attempt. There is also growing evidence that homicides and other violent behaviors are frequently followed by suicides, indicating a relation between aggression directed against other persons and aggression against oneself (Asnis, Kaplan, van Praag, & Sanderson, 1994; Botsis, Soldatos, Liossi, Kokkevi, & Stefanis, 1994; Boudouris, 1994; Castrogiovanni, Pieraccini, & DiMuro, 1998; Kennedy, Iveson, & Hill, 1999). The aim of this study was to

examine the association between suicidal ideation and aggressiveness, especially the relationship between outwardly directed aggression, auto-aggression and inhibition of aggression in suicide attempters ("first-timers" and "repeaters") as well as in non-clinical controls.

METHOD

Participants

The clinical sample consisted of $n = 68$ suicide attempters (39 females, 29 males) treated as inpatients at the Psychiatric Department of the University of Graz (Austria). The diagnoses based on the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 1994) included Major Depression (52%), Borderline-Personality Disorder (21%), Eating Disorders (13%), Schizophrenia or Other Psychotic Disorders (14%). Patients were tested within one week after admission to the hospital. The clinical sample was compared with a non-clinical sample of $n = 70$ normal controls (38 females, 32 males) showing a similar socio-economic background as the clinical sample. The control group was recruited by advertisement in a local newspaper. Participants ranged in age from 15 to 71 years with $M = 31.3$ ($SD = 12.8$) for patients and $M = 30.8$ ($SD = 11.8$) for controls. For a detailed description, see Table 1.

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Measures

The assessment battery administered to the suicide attempters included (a) the Basis Documentation of Suicidal Behavior (BDSB; "Basisdokumentation suizidalen Verhaltens") by Schaller, Schmidtke, Torhost, Wächtler, and Wedler (1987), (b) the Aggressive Factors Questionnaire (AFQ; "Fragebogen zur Erfassung von Aggressivitätsfaktoren") by Hampel and Selg (1975), (c) the Hopelessness Scale (HS) by Krampen (1979), and (d) the Suicide Intention Scale (SIS) by Minkoff, Bergman, Beck, and Beck (1973).

The BDSB contains diagnosis, sociodemographic data, anamnesis, information about the circumstances of the suicidal act and medical factors. The AFQ consists of 77 items representing five factors of aggressive cognitions and proneness to aggressive behavior: Spontaneous Aggression (SA; Factor 1), Reactive Aggression (RA; Factor 2), Excitability (E; Factor 3), Depression/Auto-aggression (AA; Factor 4), and Inhibition of Aggression (IA; Factor 5). Furthermore, a measure of the Total Outwardly Directed Aggression (TOA) is provided by summarizing Factors 1 to 3. The HS (standard form) is a German adaption of the Hopelessness Scale developed by Beck, Weissman, Lester, and Trexler (1974). It contains 20 items pertaining to participants' negative expectations about their own future. The SIS consists of 15 items. The scale was designed to assess the degree of seriousness of previous suicide attempts. The first eight items aim at the objective circumstances of the attempt (e.g., final acts, timing), the last seven items retrospectively address the thoughts and feelings at the time of the attempt.

Participants of the control group were assessed by means of the AFQ and HS. A preliminary interview was performed to gather information concerning possible substance abuse and past suicide attempts. Participants who had a history of suicide attempts were excluded from the non-clinical sample.

Procedure and Data Analysis

For each sample two age groups were formed by median splitting. The median age scores for the clinical and non-clinical sample were $Md = 28$ and $Md = 27$ years, respectively. Furthermore, participants of the non-clinical sample were requested to comment on the statement: "Lately I have thought a lot about killing myself". If the answer was "yes", participants were assigned to the subgroup of "ideators"; otherwise, they were classified as "non-ideators". On the basis of the information provided by the BDSB, the clinical sample was divided into "first time attempters" (first-timers) and "repeaters". These four sub-

groups formed the Groups factor the levels of which appear to represent increasing degrees of suicide risk. With Groups and Age as between-participants factors, the layout of a 4 (Groups) x 2 (Age) ANOVA design was obtained for analysing AFQ and HS data. Within the clinical sample, a 2 (Groups) x 2 (Age) ANOVA was performed on the SIS scores. The Tukey-Kramer modification of the HSD (honestly significant difference) test (Kirk, 1982) was utilized for a-posteriori comparisons among means. Demographic and BDSB data were subjected to chi-square analyses. With the exception of a-posteriori comparisons, all data were analysed using SPSS-X version 7.5. Alpha level of significance was set at .05 for all statistical tests. Estimates of statistical power of group effects were expressed in terms of ω^2 (Winer, 1972).

RESULTS

Demographic Characteristics

Table 1 compares the demographic characteristics of suicide ideators and those not reporting thoughts of suicide with first time attempters and repeaters. Neither age nor occupational status substantially influenced the distribution of respondents in the four groups. However, gender differences were found to be statistically significant, $\chi^2(3, N = 138) = 9.34, p < .05$, with females more frequently being ideators, first time attempters and repeaters than males. Chi-square analysis revealed also significant differences for the educational status. Ideators and non-ideators in the non-clinical sample showed a higher level of education than clinical participants, $\chi^2(6, N = 138) = 60.61, p < .001$. In view of the zero cell frequencies in the contingency tables for marital status and substance abuse in the non-clinical sample, we refrained from performing statistical tests. Nonetheless, it is interesting to note that there was no one among the non-clinical participants who was divorced or widowed. Furthermore, nearly all substance abusers (84%) were found among the suicide attempters. Within the clinical sample, substance abuse was more frequently observed in males than in females, $\chi^2(1, n = 68) = 7.17, p < .01$.

The Basis Documentation of Suicidal Behavior

Age was found significant, with older participants (over 27 years) more frequently being repeaters than younger ones, $\chi^2(1, n = 68) = 4.11, p < .05$. Gender did not influence the number of previous attempts. Furthermore, no significant age and gender differences were observed with re-

Table 1

Demographic Characteristics: Non-ideators and Ideators (Non-clinical Participants) versus First Time Attempters and Repeaters (Inpatients)

		Non-ideators		Ideators		First-timers		Repeaters	
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Gender	Male	29	55.8	3	16.7	25	45.5	4	30.8
	Female	23	44.2	15	83.3	30	54.5	9	69.2
Age (Years)	≤ 27	26	50.0	10	55.6	34	61.8	4	30.8
	> 27	26	50.0	8	44.4	21	38.2	9	69.2
Education	Elementary school	1	2.0	1	6.2	37	67.3	9	69.2
	Secondary school	38	79.2	12	75.0	14	25.5	2	15.4
	University	9	18.8	3	18.8	4	7.2	2	15.4
Marital status	Single	36	69.2	13	72.2	36	65.5	5	38.5
	Married	16	30.8	5	27.8	11	20.0	5	38.5
	Divorced	0	0	0	0	3	5.5	0	0
	Widowed	0	0	0	0	5	9.0	3	23.0
Occupation	Employed	22	44.9	8	44.5	30	54.6	6	46.2
	Unemployed	6	12.2	4	22.2	7	12.7	3	23.0
	Student/Retired	21	42.9	6	33.3	18	32.7	4	30.8
Substance abuse		4	7.7	0	0	16	29.1	5	38.5
	Male	3	75.0	0	0	12	75.0	2	40.0
	Female	1	25.0	0	0	4	25.0	3	60.0
	Age ≤ 27	3	75.0	0	0	7	43.8	3	60.0
	Age > 27	1	25.0	0	0	9	56.3	2	40.0

Table 2

Means and Standard Deviations on the AFQ (Aggressive Factors Questionnaire) Scales (Stanine Scores), the HS (Hopelessness Scale) and SIS (Suicide Intention Scale)

Scales	Non-ideators (<i>n</i> =52)		Ideators (<i>n</i> =18)		First-timers (<i>n</i> =55)		Repeaters (<i>n</i> =13)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
AFQ								
Spontaneous aggression (SA)	4.29	(1.99)	5.05	(2.01)	4.02	(1.78)	5.61	(2.33)
Reactive aggression (RA)	3.54	(1.73)	4.00	(1.94)	4.29	(1.84)	5.31	(2.98)
Excitability (E)	4.69	(1.61)	5.56	(1.82)	5.29	(2.16)	6.61	(1.61)
Total outward aggression (TOA)	4.02	(1.93)	5.00	(2.11)	4.45	(1.97)	6.15	(2.58)
Auto-aggression (AA)	4.15	(2.03)	4.83	(1.42)	6.80	(1.80)	8.15	(1.14)
Inhibition of aggression (IA)	3.60	(1.50)	2.89	(1.64)	4.90	(1.88)	5.23	(1.79)
HS	23.67	(2.85)	25.05	(3.37)	28.81	(3.08)	26.23	(3.11)
SIS					13.40	(6.17)	14.23	(4.76)

gard to types of suicide attempts (suicide vs parasuicide), methods (poisoning, cutting arteries, hanging, drowning), the intention (dying, safety, help, revenge) and motives (partnership, family, friends, job, disease).

Suicide Risk and Aggressiveness

Means and standard deviations for the AFQ scales, the HS and the SIS are presented in Table 2.

Analyses of variance yielded significant differences among non-ideators, ideators, first time attempters and repeaters on nearly all AFQ scales (RA: $F(3, 130) = 2.77, p < .05, \text{est. } \omega^2 = .04$; E: $F(3, 130) = 3.61, p < .02, \text{est. } \omega^2 = .05$; TOA: $F(3, 130) = 3.59, p < .02, \text{est. } \omega^2 = .05$; AA: $F(3, 130) = 26.56, p < .001, \text{est. } \omega^2 = .36$; IA: $F(3, 130) = 9.21, p < .001, \text{est. } \omega^2 = .15$). Figure 1 displays the TOA, AA and IA scores as a function of suicide risk expressed in terms of group membership. As can be seen from Figure 1, the mean AA scores increase more rapidly across the risk groups than the TOA and IA values.

Pairwise comparisons among means by Tukey-Kramer's modification of the HSD test revealed a variety of significant differences between clinical and non-clinical participants (all $ps < .05$). Compared with non-ideators, repeaters exhibited higher scores on the RA, E, AA, IA and TOA scale. Moreover, repeaters also showed higher scores on the AA and IA scale than first time attempters. Similar differences were found on the AA and IA scale between ideators, first time attempters and repeaters, respectively. Within the clinical sample, repeaters exhibited higher

scores on the SA and TOA scale than first time attempters. No significant differences were found within the non-clinical sample between ideators and non-ideators.

A closer look at the change of difference scores between measures of aggressiveness across the risk groups might allow some insight into the interplay between outwardly directed aggression, auto-aggression and inhibition of aggression. An one-way ANOVA showed significant differences between the four groups for the difference scores between AA and TOA, ($F(3, 134) = 10.83, p < .001, \text{est. } \omega^2 = .18$). As can be seen in Figure 2, AA dominates over TOA in first time attempters and repeaters (positive differences), whereas non-clinical participants (ideators and non-ideators) are able to maintain a proper balance between AA and TOA. Furthermore, the dominance of AA over IA (negative differences) is more pronounced in ideators, first time attempters and repeaters than in non-ideators, ($F(3, 134) = 7.12, p < .001, \text{est. } \omega^2 = .12$). Finally, IA prevails against TOA only in first time attempters; for non-ideators as well as first time attempters and repeaters the mean difference scores IA minus TOA were negative. Compared with non-ideators whose difference scores were close to zero, large negative differences were observed in ideators and repeaters, ($F(3, 134) = 4.25, p < 0.01, \text{est. } \omega^2 = .07$).

Hopelessness and suicide intention

Groups showed significant differences on the HS, ($F(3, 102) = 15.06, p < .001, \text{est. } \omega^2 = .28$). A-posteriori tests (all $ps < .05$) revealed that non-ideators exhibited less hope-

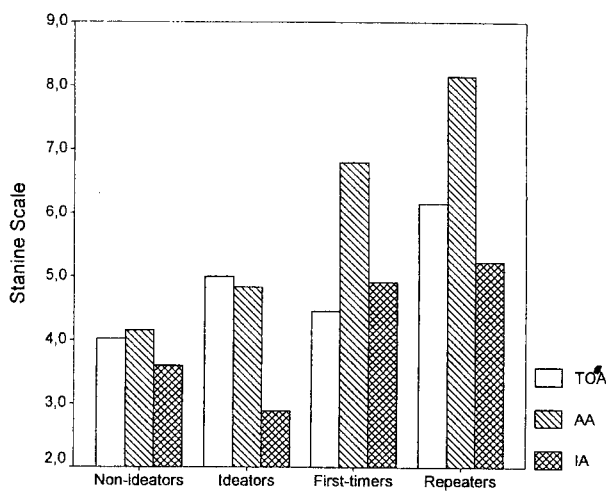


Figure 1. Mean TOA (Total Outwardly Directed Aggression), AA (Auto-aggression) and IA (Inhibition of Aggression) scores for suicide attempters and non-clinical participants (ideators and non-ideators).

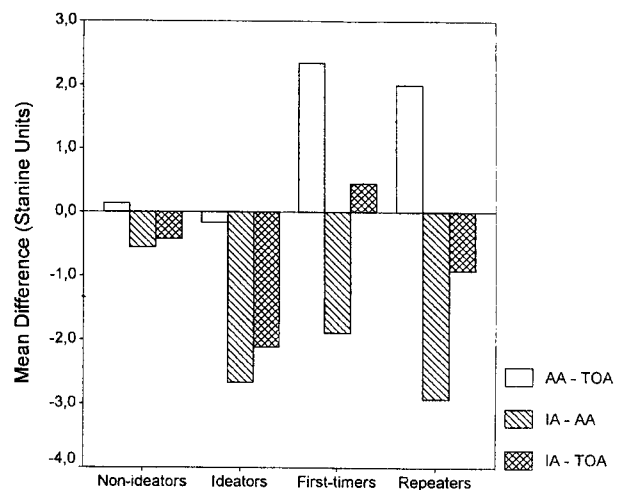


Figure 2. Interplay between the AFQ (Aggressive Factors Questionnaire) dimensions TOA (Total Outwardly Directed Aggression), AA (Auto-aggression) and IA (Inhibition of Aggression) in suicide attempters and non-clinical participants (ideators and non-ideators)

lessness than first time attempters and repeaters (Table 2). Moreover, first time attempters scored higher on the HS than ideators in the non-clinical sample. As for SIS, no significant differences were found among first time attempters and repeaters (see also Table 2).

DISCUSSION

The distinction between non-clinical participants who did not report thoughts of wishing to terminate their lives and non-clinical participants who admitted to thoughts of suicide on the one hand and psychiatric inpatients who implemented a suicide plan once or repeatedly on the other hand may be considered as a means of assessing suicide risk at an ordinal level. It was shown that nearly all measures of aggressiveness - inwardly and outwardly directed aggression as well as inhibition of aggression - can be displayed as a monotonic function of suicide risk.

Interpersonal Aggression and Suicidal Behavior

As far as outwardly directed aggression is concerned, our findings are consistent with previous research. A relationship between various expressions of outwardly directed aggression and suicidal behaviour has been documented in numerous studies. Asnis et al. (1994) found that the homicide attempt group reported significantly more suicidal ideation and more suicide attempts than the homicidal ideation group; the homicide attempt group was also more likely to have committed more multiple suicide attempts than the group with homicidal ideation alone or the group with no homicidal behaviors. Furthermore, results of Greenwald, Reznikoff, and Plutchik (1994) indicated that suicide and violence risk were significantly positively correlated.

AFQ Factors and Impulsivity

Mann, Waternaux, Haas, and Malone (1999) found that severity of current depression or psychosis did not distinguish patients who had attempted suicide from patients with no history of suicide attempts. However, scores on suicidal ideation, rates of life time aggression and impulsivity were higher in attempters than in non-attempters. Evans, Platts, and Liebenau (1996) examined the role of impulsivity in patients referred for psychiatric assessment after deliberate self-harm. It was shown that those who deliberately self-harm are more impulsive than members of the general population. Moreover, repeaters exhibited sig-

nificantly higher impulsiveness scores than first-timers. The authors defined impulsiveness "as a tendency to respond quickly to a given stimulus, without deliberation and evaluation of the consequences" (p. 380). Obviously, impulsiveness shares some crucial features with the AFQ factors SA (Spontaneous Aggression) and E (Excitability). A recent study (Corruble, Damy, & Guelfi, 1999) that focused on impulsivity in depressed patients found that suicide attempters scored higher on the impulsivity scale than non-attempters. Impulsive behaviour also appears to be a particular problem with respect to gun-related suicide attempts (Miller & Hemenway, 1999).

Implications of the Imbalance Between Outwardly and Inwardly Directed Aggression

There is no doubt about the importance of outwardly directed aggression for suicidal behaviors. Yet, compared with the large body of research on outwardly directed aggression, there are only few empirical studies that examined the relationship between outwardly and inwardly directed aggression in suicide ideators and suicide attempters. The results of the present study indicated that auto-aggression increased across the risk groups. Repeaters showed higher scores on the AA scale than non-ideators and first time attempters. No evidence was found for Ringel's (1953) hypothesis of a turnabout of outwardly directed aggression to inwardly directed aggression. Our findings appear to be more consistent with Plutchik's two-stage model of countervailing forces (Plutchik, van Praag, & Conte, 1989). This model assumes that certain psychosocial conditions such as threat or loss trigger an aggressive impulse. Whether or not the impulse is expressed in overt behavior depends on the presence or absence of amplifying and attenuating forces (stage I variables). The direction of overt aggression is determined by stage II variables. Parental loss, alcohol or drug dependence have been identified as amplifiers at stage I (Botsis, Plutchik, Kotler, & van Praag, 1995), while antisocial personality traits or schizoid and compulsive styles can be considered as stage II determinants (Greenwald, Reznikoff, & Plutchik, 1994).

In accordance with Plutchik's two-stage model, the results of this study indicated that none of the non-clinical participants was divorced or widowed. Amplifying stage I variables such as loss of one's marital partner and substance abuse were more frequently observed among suicide attempters than among non-attempters. Furthermore, the dominance of auto-aggression over outwardly directed aggression in suicide attempters can be regarded as stage II determinant of the direction of aggressivity. By contrast, non-attempters (ideators and non-ideators in the non-clinical sample) were able to maintain a proper balance between AA and TOA scores. As can be seen in Figure 2, the

dynamic interplay of countervailing forces at stage II also comes under the influence of the imbalance between auto-aggression and inhibition of aggression. It was found that the mean difference between IA and AA scores was more pronounced (that is negative) in ideators, first time attempters and repeaters, whereas the average difference score for non-ideators came close to zero. The IA scale is mainly characterized by statements such as "I believe that one should return good for evil, and I do so" or "The term sin is necessary, and I believe that sins will be punished". To a large extent, the IA scale therefore seems to assess respondents' orientations toward moral instances. Possibly, commitment to moral instances could serve as protection against the threat of uncontrollable aggression (either outwardly or inwardly directed). Low self-esteem, often associated with suicidal behavior (Overholser, Adams, Kim, Lehnert, & Brinkman, 1995), may strengthen such commitment to moral instances.

Among stage II variables that are supposed to determine the direction of aggression inward, hopelessness seems to play an important role. In support of this hypothesis, it was found that non-ideators exhibited less hopelessness than first time attempters and repeaters. Moreover, first time attempters showed a greater extent of hopelessness than ideators in the non-clinical sample. No significant differences were found between first time attempters and repeaters on SIS. Obviously, multiple attempts are not indicative of a more serious intention to die than first attempts.

Policy of suicide prevention needs to take greater account of both the presence of suicide ideation and the imbalance between heightened levels of outwardly and inwardly directed aggression. The assessment of different dimensions of aggressiveness may be useful as guides to estimate suicide risk. Clearly, further studies including non-clinical samples as well as patients with different psychiatric diagnoses will be needed to identify the relevant risk factors for suicidal acts across personality traits and diagnostic categories.

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