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The Relationship Between Impulsive Verbal Aggression and Intermittent Explosive Disorder

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Intermittent explosive disorder (IED) is the sole psychiatric diagnostic category for which aggression is a cardinal symptom. IED focuses on physical aggression, but researchers have argued for the inclusion of verbal aggression (VA) (e.g., arguing, threatening) as a part of the IED criteria set. The utility of VA in identifying clinically relevant aggression, however, is unknown. IED participants were compared to individuals without a marked history of physical aggression, but who report frequent (two or more times a week) VA, and non-aggressive personality-disorder individuals on behavioral and self-report measures of aggression, self-report measures of related constructs (e.g., anger, affective lability), and a clinician assessment of psychosocial impairment. Both the IED and VA groups were more aggressive, angry, and clinically impaired than personality-disorder individuals, while the IED and VA groups did not differ from each other on these measures. These results support the clinical importance of frequent VA for future iterations of the IED criteria set. Aggr. Behav. 34:51–60, 2008. © 2007 Wiley-Liss, Inc.

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INTRODUCTION

Pathological impulsive aggression, despite being a global public health concern [Krug et al., 2002] is poorly understood. The only adult disorder that includes "impulsive" (i.e., reactive, anger-based) aggression as a cardinal symptom is intermittent explosive disorder (IED). IED is defined by the Diagnostic and Statistical Manual [DSM-IV; American Psychiatric Association, 2000] as recurrent impulsive acts of serious assault and/or destruction of property that is disproportionate to the situation and not better accounted for by another substance, medical condition or psychological disorder, such as borderline personality disorder (PD) or antisocial PD. Although initially believed to be rare [American Psychiatric Association, 2000], recent epidemiological studies [Kessler et al., 2005] have found DSM-IV IED to be one of the more common psychological disorders, with a lifetime prevalence of approximately 5%. Even this may be an underestimate of pathological impulsive aggression, as current DSM-IV IED criteria are limited to physical aggression, and fail to take into consideration individuals who engage in frequent verbal aggression (VA), such as arguing, insulting, and making threats.

Most definitions of aggression acknowledge that aggression is multidetermined and includes both physical (e.g., fistfights) and verbal (e.g., arguments, insults, threats) assaults, either of which can be pathological when used rigidly in situations that are better served by a non-aggressive response [e.g., Stone, 1995]. Concerned with the omission of VA and other limitations of the DSM-IV IED diagnosis, Coccaro and colleagues developed a broader IED criteria set for research purposes (IED—Integrated Research Criteria [IED-IR] Coccaro, 2003). Under the IED-IR criteria, a diagnosis can be assigned if frequent VA (i.e., two or more times a week for over a month) was present even in the absence of physical aggression, as long as the VA

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was impulsive, disproportionate to the provocation, and not better accounted for by a substance, medical condition, or other mental disorder. The IED-IR criteria also eliminated the DSM criterion that specified excluding individuals whose impulsive aggression was "better accounted for" by antisocial PD or borderline personality disorder. The latter change was made to eliminate the confound of trying to determine which of two chronic disorders is more associated with an individual's impulsive aggression. The co-diagnosing of IED among individuals with antisocial or borderline PD was also supported by preliminary data showing that individuals with antisocial or borderline personality disorder, who also meet IED criteria, have significantly greater psychosocial impairment than individuals with borderline personality disorder, who do not meet IED criteria [Coccaro, 2003].

Several studies have provided preliminary evidence for the validity of the IED-IR criteria set. Individuals meeting IED-IR criteria reported more impulsiveness, anger and aggression, and had poorer psychosocial functioning than a personality disordered comparison group [Coccaro et al., 1998]. This finding was replicated and extended recently in a study that included a behavioral measure of aggression as well as Axis I and healthy volunteer comparison groups [McCloskey et al., 2006]. In this study, individuals meeting IED-IR criteria exhibited the highest level of behavioral aggression. Furthermore, a comparison of IED-IR individuals who did and did not meet the more restrictive DSM-IV IED criteria found that the two groups did not differ in terms of anger, aggression, or psychosocial impairment, supporting the clinical utility of the IED-IR diagnosis.

However, neither the Coccaro et al. [1998] nor the McCloskey et al. [2006] study differentiated between IED-IR participants who failed to meet the DSM-IV IED criteria because of insufficient physical aggression, but who exhibited frequent VA, from participants who failed to meet the DSM-IV IED criteria due to the presence of antisocial or borderline personality disorder. Therefore, it is possible that frequent VA is not associated with the severity of psychosocial impairment found in IED, and that the Coccaro et al. [1998] and McCloskey et al. [2006] findings were solely a product of the sub-population of IED-IR patients with borderline and/or antisocial personality disorder, many of whom did display physical aggression severe enough to otherwise warrant a DSM-IV diagnosis of IED. Thus, it is still unclear if individuals with frequent VA should be characterized as having pathological impulsive aggression, possibly warranting inclusion in the next iteration of the DSM-IED criteria set.

The purpose of the present study was to compare non-medicated individuals from three groups: (1) individuals with clinically significant physical aggression (i.e., patients diagnosed with DSM -IV IED; IED group); (2) individuals without DSM-IV IED solely due to a lack of physical aggression, but who meet IED-IR criteria due to frequent VA (i.e., heated arguments that were disproportionate to the provocation occurring at least twice a week for a month or longer that are not better accounted for by another substance, medical condition or disorder) VA; and (3) individuals with a PD who do not meet criteria for either of the two preceding groups. Participants were assessed for severity of aggression using a multimethod approach that includes behavioral, questionnaire, and clinical interview measures. The behavioral measure chosen was a laboratory paradigm, the Taylor Aggression Paradigm [Taylor, 1967], which has been validated to predict a lifetime history of aggressive behavior. This represents the first study to compare directly IED and VA (pathological aggression characterized by verbally aggressive acts rather than physically aggressive acts) on behavioral and self-report measures of aggression. Constructs associated with aggression (e.g., anger, affective lability, impulsiveness) were also examined, as was overall psychosocial functioning. We predict that the VA and IED groups will not differ in levels of behavioral and self-reported levels of aggression (other than those that measure primarily physical aggression—i.e., the physical aggression scale of the Buss Perry Aggression Questionnaire, the use of extreme shock on the Taylor Aggression Paradigm, and possibly the Life History of Aggression), anger, psychosocial functioning, or related constructs. It is also hypothesized that both VA and IED groups will show increased aggression, anger, impulsiveness, and affective lability as well as decreased psychosocial functioning compared to the personality disordered control group.

METHOD

Participants

Participants were 39 men and 29 women (age $M = 38.57$; SD = 11.42) recruited via advertisements for individuals with emotional problems as a part of larger ongoing aggression studies at the University of Chicago. Informed consent was obtained for all participants. Participants were excluded if they reported (a) current psychopharmacological

treatment or substance dependence, (b) lifetime bipolar or psychotic disorder, (c) a traumatic head injury, or (d) a current major depressive episode. Participants in the VA or IED groups were also excluded if they met criteria for borderline or antisocial personality disorder. This was done to avoid the diagnostic controversy concerning the co-diagnosing of these disorders and IED [Berman et al., 1998; Coccaro, 2003]. Furthermore, by definition, participants with a history of co-morbid Axis I disorders (e.g., major depressive disorder) were only considered as VA or IED if they met full criteria independent of the co-morbid disorder (e.g., meeting aggression frequency and severity criteria when not depressed). This study was approved by the University of Chicago Internal Review Board.

Participants were predominately Caucasian (56%) or African American (30%), and were relatively well educated (84% had some college education). Median family income range was $35,000–49,999. Participants were categorized into: (a) IED ($n = 23$), (b) VA ($n = 21$)—defined as meeting all DSM-IV IED criteria other than physical aggression, while meeting IED-IR criteria for VA (i.e., heated arguments that were disproportionate to the provocation occurring at least twice a week for a month or longer that are not better accounted for by another substance, medical condition or disorder), and (c) PD without IED or VA (PD: $n = 24$) groups, assigned via a semi-structured interview. Note that all 23 individuals with IED also reported recurrent acts of VA, with 18 of the 23 subjects evidencing levels of VA sufficient to otherwise meet the VA criteria.

Psychiatric Interview Measures

Structured Clinical Interview for the DSM-IV (SCID). The SCID [First et al., 1996] is a semi-structured clinical interview used to assign diagnoses for mood disorders, psychotic disorders, substance abuse and dependence, anxiety disorders, somatoform disorders, eating disorders, and adjustment disorders. The SCID has adequate inter-rater reliability with κ values for modules reported to be between .70 and 1.00.

Structured Interview for DSM-IV Personality (SIDP). The SIDP [Pfohl et al., 1995] was employed to diagnose DSM-IV personality disorders. Estimates of inter-rater reliability for the SIDP are reported to be adequate to strong with intraclass correlation coefficients as high as .88–.99 [Damen et al., 2004].

Intermittent Explosive Disorder Interview . The IED interview [Coccaro, 2005] is a semi-structured clinical interview used to diagnose DSM-IV IED and frequent VA. The IED interview obtains quantitative (e.g., frequency) and qualitative (e.g., description of most severe events) information for VA, aggression against property, and aggression against others, as well as aggression-related distress and psychosocial impairment and potential exclusionary information (i.e., aggressive acts occurring solely within the context of another Axis I disorder, substance use, or a medical condition). Preliminary data show the IED interview to be a valid and reliable instrument.

Global Assessment of Functioning (GAF). The GAF [APA, 2000] is a 0–100 score that reflects the extent to which psychological problems have impaired social and occupational functioning. Lower scores reflect greater psychosocial impairment.

Behavioral Measure of Aggression

Taylor Aggression Paradigm (TAP). The TAP [Taylor, 1967] is a classic laboratory measure of retaliatory aggressive behavior. In this task, the participant competes against an increasingly provocative fictitious opponent in a reaction-time game (for a more detailed description of the TAP, see Taylor [1967]). Before each trial, the participant selects a shock level (the dependent variable) for the opponent to receive should the participant win (have a faster reaction time) the trial. A rich literature supports the reliability and validity of the TAP as a measure of aggressive behavior [McCloskey and Berman, 2003].

Self-Ratings of Aggression and Associated Constructs

Buss–Perry Aggression Questionnaire (BPAQ). The BPAQ [Buss and Perry, 1992] is a self-report measure of trait aggressiveness. The BPAQ consists of 29 items each scored using a four-point Likert-type scale. The BPAQ consists of four scales: physical aggressiveness, verbal aggressiveness, anger, and hostility (i.e., suspiciousness and resentment). The BPAQ has well-known psychometric properties.

Life History of Aggression-Aggression Scale (LHA-AS). The LHA-AS [Coccaro et al., 1997] is a 5-item retrospective semi-structured clinical interview of the frequency and severity of lifetime aggressive behavior. The LHA-AS has high internal consistency ($\alpha = .87$), excellent inter-rater reliability (ICC = .95), and good test–retest reliability ($r = .80$).

Barratt Impulsivity Scale 11 (BIS-11). The BIS-11 [Patton et al., 1995] is a 34-item questionnaire

of motoric, attentional, and non-planning impulsiveness. Each item is rated on a four-point scale ranging from ''Rarely/Never'' to ''Almost always/Always.'' The BIS-11 is an internally consistent ($\alpha = .79$–$.83$), valid measure of impulsiveness.

Affective Lability Scale (ALS). The 54-item ALS [Harvey et al., 1989] is a questionnaire that assesses propensity to change affective state (higher scores indicate greater affective lability). The ALS contains six subscales, four scales that assess lability from euthymia to anger, anxiety, hypomania, and depressed mood. Two scales measure vacillation between depression and hypomania (biphasic) and anxiety and depression (anxiety/depression). The ALS is a reliable instrument with a demonstrated construct and discriminant validity.

Procedure

The protocol was approved by the University of Chicago's Institutional Review Board. On visit 1, participants completed a 3–4 hr diagnostic interview conducted by trained graduate-level diagnosticians who were not informed about the study hypotheses. IED and VA diagnoses were made using the IED interview. Personality disorders were assessed using the SID-P. Non-IED Axis I diagnoses were assigned using the SCID. The LHA-AS was also administered. Diagnosticians assigned a GAF score based on the information obtained during the interview. All diagnoses and GAF scores were confirmed using a ''best estimate procedure'' in which the diagnostic report was reviewed by a committee of psychiatrists, psychologists, and diagnosticians [Klein et al., 1994]. Between visits 1 and 2, participants completed a booklet containing the BPAQ, BIS, and ALS.

On visit 2, participants completed a urine drug test and alcohol breathalyzer test, and then were prepared for the TAP. Fingertip electrodes were attached to two of the participants' fingers, then the experimenter left ''to prepare the other subject'' for the experiment. After a short delay, an upper shock pain threshold was determined by administering increasingly intense shocks at 100-μA intervals until the participant reported that the shock was ''very unpleasant.'' To increase the credibility of the experimental situation, this procedure was repeated with the other ''subject'' (an audiotape of a confederate), and overheard by the participant. After the threshold determination, instructions were provided via intercom to both ''subjects,'' indicating that the purpose of the task was to see which subject could lift a finger off a reaction-time key the fastest. Before each reaction-time trial, each subject was to select a shock from 0 through 10 or 20 by pressing one of 12 buttons on the bottom of the console. The slower person on each trial would receive the shock chosen by their opponent before that trial. The 10 shock corresponded to the shock level judged very unpleasant. Shocks 9 through 1 were 5% decrements of the 10 shock, such that 1 was 55% of the maximum threshold. The participant was informed that the 20 shock would administer a ''severe'' shock, twice the intensity of the 10 (in the one instance the fictitious opponent selects a 20, the participant does not receive the shock because he or she ''wins'' the trial). Thus, a 20-shock selected by the participant indicated extreme ag gression. Participants were also given a ''0,'' (no) shock option.

Participants next completed 28 reaction-time trials consisting of an initial trial, followed by four, 6-trial blocks of increasing provocation by the opponent with a transition trial between blocks. The average shock setting by the fictitious opponent across the first three blocks was 2.5, 5.5, and 8.5, respectively. The fourth block differs from the third block only in that a highly aversive ''20'' shock is ostensibly selected by the opponent on the first trial of the block. The participant lost (received the opponent shock) on half the trials, with the frequency of wins and losses pre-programmed by the experimenter. After the TAP, the participant was debriefed to determine if he or she believed that the interaction was with another participant, and to ensure that the participant did not know that the true purpose of the task was to examine aggressive behavior.

RESULTS

Analyses were conducted two-tailed at the .05 level of significance. Post-hoc mean comparisons were done using Tukey's HSD test ($P < .05$) and Bonferroni corrected (.025) χ^2 analyses. Effect sizes are provided using partial eta squared ($\acute{\eta}_p^2$) for analyses of variance. For $\acute{\eta}_p^2$ .01, .06 and .14 are considered small, medium and large effect sizes [Cohen, 1988].

Preliminary Analyses

Inter-correlations among study variables. As Table I shows, most self-report measures of anger and aggression (e.g., BPAQ, LHA-AS) were significantly correlated with aggressive responding on the TAP. The association between VA scale of the BPAQ and mean TAP shock setting as well as the relationship between frequency of extreme (20) shocks and the anger scale of

TABLE I. Inter-correlations Among Study Measures

Measure	TAP-20	BP-P	BP-V	BP-A	BP-H	LHA	BIS	AL-D	AL-H	AL-B	AL-X	AL-A	AL-X/D	GAF
TAP-M	.65**	.34**	.23	.33**	.31*	.34**	.22	.12	.13	.11	.23	.23	.10	−.23
TAP-20		.39**	.25*	.23	.19	.28*	.05	−.01	−.01	−.08	.06	.10	−.08	−.22
BP-P			.67**	.70**	.71**	.37**	.16	.01	.14	.04	.16	.24*	.16	−.20
BP-V				.73**	.77**	.43**	.16	.07	.11	.15	.25*	.29*	.25*	−.26*
BP-A					.85**	.38**	.18	.12	.18	.16	.31**	.36**	.25*	−.32**
BP-H						.42**	.30*	.19	.23	.26*	.39**	.51**	.34**	−.25*
LHA							.14	.06	.07	.19	.22	.48**	.24*	−.43**
BIS								.37**	.43**	.42**	.35**	.18	.37**	−.20
AL-D									.87**	.92**	.80**	.61**	.81**	−.12
AL-H										.85**	.73**	.58**	.74**	−.03
AL-B											.86**	.67**	.88**	−.15
AL-X												.74**	.86**	−.26*
AL-A													.64**	−.25*
AL-X/D														−.18

TAP, Taylor Aggression Paradigm; TAP-20, number of TAP extreme (“20” shock) aggression; TAP–M, TAP mean shock setting; BP, Buss–Perry Aggression Questionnaire; BP-P, BP Physical Aggression Scale; BP-V, BP Verbal Aggression Scale; BP-A, BP Anger Scale; BP-H, BP Hostility Scale; LHA, Life History of Aggression-Aggression Scale; BIS, Barratt Impulsivity Scale; AL, Affective Lability Scale; AL-D, AL Depression Subscale; AL-H, AL Hypomania Subscale; AL-B, AL Biphasic Subscale; AL-X, AL Anxiety Subscale; AL-A, AL Anger Subscale; AL-X/D, AL Anxiety/Depression Subscale; GAF, Global Assessment of Functioning.
*$P < .05$; **$P < .01$.

TABLE II. Demographic Variables as a Function of Diagnostic Group

	Diagnostic group			
Variable	IED	VA	PD	Total
Age (SD)	39.57 (10.12)	39.05 (13.20)	37.21 (11.27)	38.57 (11.42)
Gender (%)				
Male	13 (56.5%)	11 (52.4%)	15 (62.5%)	39 (57.4%)
Female	10 (43.5%)	10 (47.6%)	9 (37.5%)	29 (42.6%)
Race (%)				
Caucasian	9 (39.1%)	12 (57.1%)	17 (70.8%)	38 (55.9%)
AA	9 (39.1%)	7 (33.3%)	5 (20.8%)	21 (30.9%)
Other	5 (21.7%)	2 (9.5%)	2 (8.3%)	9 (13.2%)
Education (%)				
No college	3 (13.0%)	3 (14.3%)	5 (20.8%)	11 (16.2%)
Some college	11 (47.8%)	9 (42.9%)	7 (29.2%)	27 (39.7%)
College grad	9 (39.1%)	9 (42.9%)	12 (50.0%)	30 (44.1%)

AA, African American; IED, intermittent explosive disorder; VA, verbal aggression; PD, personality disorder.

the BPAQ were both at a non-significant trend ($P = .06$). BPAQ hostility was unrelated to frequency of extreme shocks. The self-report anger and aggression scales were all highly correlated with each other, as were the two behavioral aggression indices. Self-reported impulsiveness (BIS) was only related to BPAQ hostility. Anger lability (ALS-Anger) was correlated with all self-report measures of anger and aggression, and with mean, but not extreme, shock selection. The relationship between the other affective lability scales and anger/aggression measures was varied. Depressive, hypomanic, and bipolar scales of the ALS showed little to no association with anger/aggression variables, while anxiety and anxiety/depression ALS scales were associated with self-reported VA, hostility, and anger. The ALS scales were, for the most part, highly intercorrelated. Apart from physical aggression, all self-report anger and aggression scales were negatively correlated with psychosocial functioning (i.e., GAF score), as were anxiety lability and anger lability. The correlation between psychosocial functioning and behavioral indices of aggression also approached significance ($P < .08$).

Demographic variables. The three groups did not differ in age, $F(2,68) < 1$, gender, $\chi^2(2, N = 68) < 1$, race, $\chi^2(4, N = 68) = 5.36$, $P = .25$, or education, $\chi^2(4, N = 68) = 1.94$, $P = .74$ (see Table II for demographic variable means and percentages).

TABLE III. Lifetime Psychopathology as a Function of Diagnostic Group

	Group			
Measure	IED	VA	PD	*P*-value
Axis I psychopathology				
Any Axis I (% subjects)	18/23 (78%)	18/21 (86%)	15/24 (63%)	.181
Mood disorder	15/23 (65%)	10/21 (47%)	9/24 (37%)	.159
Anxiety disorders	7/23 (30%)	7/21 (33%)	5/24 (20%)	.614
Substance disorders	9/23 (39%)	10/21 (47%)	8/24 (33%)	.619
Number of diagnoses (SD)	1.91 (1.46)	1.52 (1.07)	1.37 (1.46)	.324
Axis II psychopathology				
Prevalence (% subjects)[ab]	17/23 (74%)	17/21 (81%)	24/24 (100%)	.033
Number of diagnoses (SD)	1.13 (0.69)	0.95 (0.38)	1.29 (0.55)	.144

[a]IED and PD groups significantly different.
[b]VA and PD groups significantly different.
IED, intermittent explosive disorder; VA, verbal aggression; PD, personality disorder.

Psychopathology. As evidenced in Table III, there were no group differences in proportion of lifetime (non-IED) Axis I diagnoses, $\chi^2(2, N=68)=3.41$, $P=.18$. More specifically, the groups did not differ in prevalence of lifetime mood [$\chi^2(2, N=68)=3.68$], anxiety [$\chi^2(2, N=68)<1$], or substance [$\chi^2(2, N=68)<1$] disorders. Groups also did not differ with regard to mean number of Axis I disorders, $F(2,65)<1$. Group differences were found for proportion of participants with a personality disorder, $\chi^2(2, N=68)=6.83$, $P<.05$. Post-hoc analyses revealed that the prevalence of personality disorders was significantly less in the IED and VA groups than within the PD comparison group (which was by definition 100%). IED and VA groups did not differ. There was no group effect for number of personality disorders, $F(2,65)=2.04$, $P=.14$.

Measures of aggression (see Table IV for the means (SD) and *P*-values for all dependent variables)

Behavioral aggression (TAP Shock Selections[1,2]). TAP 20-shocks were re-coded as 11 to minimize their influence on mean shock calculations [McCloskey and Berman, 2003]. A 3 × 2 ANOVA for mean shock selection revealed a main effect for group, $F(2,58)=5.08$, $P<.01$ ($\acute{\eta}_p^2=.15$). Post-hoc tests showed IED and VA participants set higher shocks than PD participants. IED and VA groups did not differ from each other. The effect of gender [$F(1,58)<1$] and the gender × group interaction [$F(2,58)<1$] were not significant.

The extreme shock (number of 20 shocks) data were positively skewed (skewness $z=3.16$). Therefore the data were transformed (cube root), which reduced the skew to acceptable levels (skewness $z=1.19$). A 3 × 2 ANOVA for number of extreme shocks revealed a main effect for group $F(2,58)=3.58$, $P<.05$ ($\acute{\eta}_p^2=.11$). Post-hoc tests showed IED participants set more extreme shocks than PD participants. There was also a non-significant trend for VA participants to set more extreme shocks than PD participants (Tukey HSD = .07). IED and VA groups did not differ from each other. The effect of gender [$F(1,58)<1$] and the gender × group interaction [$F(2,58)<1$] were not significant.

Self-report measures. A3 (group) × 2 (gender) MANOVA on the BPAQ scales revealed a significant multivariate effect of diagnostic status, Wilks $F(8,118)=3.13$, $P<.01$. Neither the multivariate effects of gender [Wilks $F(8,59)<1$)], nor gender × group interaction [Wilks $F(8,118)=1.35$, $P=.22$] were significant. Subsequent univariate analyses revealed a significant effect of group for all four BPAQ scales: physical aggressiveness [$F(2,62)=5.48$, $P<.01$, $\acute{\eta}_p^2=.15$], verbal aggressiveness [$F(2,62)=6.05$, $P<.01$, $\acute{\eta}_p^2=.16$], anger [$F(2,62)=3.86$, $P<.05$, $\acute{\eta}_p^2=.11$], and hostility [$F(2,62)=9.98$, $P<.001$, $\acute{\eta}_p^2=.24$]. Post-hoc analyses showed that the IED group was higher than the PD group on all four scales. The VA group also

[1]The TAP provides four levels of provocation. However, as there were no interactions between provocation and diagnostic group for either mean or extreme aggression, it was excluded to simplify the reporting of the analyses.
[2]Four (2 IED, 1 VA, 1 PD) participants reported believing that the Taylor Aggression Paradigm (see methods) was studying aggression and/or that the opponent was not real and were thus excluded from the TAP analyses.

TABLE IV. Aggression and Associated Dependent Variables as a Function of Diagnostic Group

	Group			
Measure	IED	VA	PD	*P*-value
TAP shock				
Mean[a,b]	5.22 (3.02)	5.42 (2.40)	3.70 (2.06)	.009
Extreme[a]	.62 (.78)	.58 (.71)	.13 (.34)	.034
BPAQ				
Physical aggression[a]	21.04 (4.20)	18.47 (3.51)	17.00 (3.83)	.006
Verbal aggression[a]	21.56 (6.02)	18.67 (5.20)	15.91 (4.20)	.004
Anger[a,b]	21.52 (5.98)	20.79 (6.55)	16.41 (5.39)	.026
Hostility[a,b]	24.39 (6.39)	20.38 (7.30)	15.12 (6.27)	.001
LHA-AS[a,b,c]	18.78 (3.87)	13.80 (4.11)	9.67 (3.88)	.001
BIS[ac]	72.21 (7.35)	63.19 (10.85)	64.50 (9.22)	.002
ALS				
Depression	26.17 (6.34)	22.52 (7.02)	22.25 (6.82)	.084
Hypomania	27.13 (6.77)	25.57 (7.76)	24.20 (7.61)	.377
Biphasic[a]	20.22 (5.53)	16.38 (6.28)	15.62 (4.75)	.012
Anxiety[a]	15.30 (4.73)	13.33 (4.97)	11.16 (3.94)	.008
Anger[a,b]	17.52 (4.60)	15.05 (5.53)	9.88 (3.43)	.001
Anxiety/depression[a,c]	18.22 (5.47)	13.19 (5.61)	13.33 (4.43)	.004
GAF[ab]	51.04 (6.22)	52.52 (7.72)	58.80 (6.71)	.001

[a]IED and PD groups significantly different.
[b]VA and PD groups significantly different.
[c]VA and IED groups significantly different.
TAP, Taylor Aggression Paradigm; Extreme, number of 20 shocks (cube root transformed); BPAQ, Buss–Perry Aggression Questionnaire; LHA-AS, Life History of Aggression-Aggression Scale; BIS, Barratt Impulsivity Scale; ALS, Affective Lability Scale; GAF, Global Assessment of Functioning; IED, intermittent explosive disorder; VA, verbal aggression; PD, personality disorder.

reported more anger and hostility in comparison to the PD, but did not differ in physical or VA. No contrasts between the IED and VA groups were significant, though the IED group showed a trend ($P = .08$) toward more physical aggression than the VA group.

A3 × 2 ANOVA on LHA-AS scores showed a main effect of group, $F(2,62) = 34.34$, $P < .001$ ($\acute{\eta}_p^2 = .53$). Post-hoc analyses indicated that participants in the IED group reported more overall aggressive acts than those in the VA group, who in turn reported more aggressive acts than those in the PD group. There was also a main effect of gender, $F(1,62) = 4.12$, $P < .05$ ($\acute{\eta}_p^2 = .06$). Men reported more aggressive acts ($M = 14.67$, SD = 5.45) than women ($M = 13.17$, SD = 5.43). There was no significant gender × group interaction $F(2,62) = 1.61$, $P = .21$ ($\acute{\eta}_p^2 = .05$).

Associated Constructs

Impulsiveness. A3 × 2 ANOVA on BIS scores revealed a main effect of group, $F(2,62) = 6.96$, $P < .01$ ($\acute{\eta}_p^2 = .18$). Post-hoc tests showed that the IED group was more impulsive than both the VA and PD groups, who did not differ from each other. Neither gender [$F(1,62) < 1$], nor the gender × group interaction [$F(2,62) = 1.36$, $P = .26$ ($\acute{\eta}_p^2 = .04$)] were significant.

Affective lability. A3 × 2 MANOVA on the six scales of the ALS showed a significant effect of group, Wilks $F(12,114) = 4.87$, $P < .001$. Follow-up ANOVAs showed significant group effects for biphasic [$F(2,62) = 4.71$, $P < .05$, ($\acute{\eta}_p^2 = .13$)], anxiety [$F(2,62) = 5.19$, $P < .01$, ($\acute{\eta}_p^2 = .14$)], anger [$F(2,62) = 16.20$, $P < .001$, ($\acute{\eta}_p^2 = .34$)], and anxiety/depression [$F(2,62) = 6.86$, $P < .01$, ($\acute{\eta}_p^2 = .18$)] scales. The groups did not differ significantly on depression and hypomania scales (both $P > .08$). Post-hoc analysis of the significant univariate effects revealed that the IED and VA groups showed more anger lability than PD participants. The IED group was higher on the anxiety/depression lability scale than both the VA and PD groups. The IED group also demonstrated greater biphasic and anxiety lability than the PD group. The IED vs. VA contrast for the biphasic scale approached significance (Tukey HSD = .06). No other group contrasts approached significance. Neither the multivariate effects of gender [Wilks $F(6,57) < 1$], nor gender × group interaction [Wilks $F(12,114) < 1$] were significant.

Psychosocial functioning. Results 3 × 2 ANOVA on GAF scores revealed a group effect, $F(2,62) = 8.01$, $P < .001$ ($\acute{\eta}_p^2 = .21$). Post-hoc analysis

showed that IED and VA participants did not differ, but both groups had lower GAF scores than the PD group. Neither gender [$F(1,62) < 1$], nor the gender × group interaction [$F(2,62) < 1$] were significant.

DISCUSSION

The clinical utility of frequent VA was examined by comparing IED, VA, and PD groups on behavioral and self-report measures of aggression, self-report measures of anger, hostility, affective lability and impulsiveness, and a clinician-rated measure of psychosocial functioning. This represents the first study to compare specifically IED and VA groups on these measures. The results indicate that IED and VA groups did not differ from each other on either behavioral aggression index, nor did they differ on any self-reported aggression or anger measures other than the self-reported total aggressive acts and (at a trend level) physical aggression. IED and VA groups also did not differ in level of psychosocial impairment, with both groups near the moderate-severe psychosocial impairment border of the GAF. In contrast, the PD group was slightly below the lower limit of mild impairment. Furthermore, both IED and VA groups engaged in greater behavioral aggression, reported more aggressive acts, greater anger, anger lability and hostility, and evidenced reduced psychosocial functioning in comparison to the PD group. Taken in total, these findings suggest that individuals with frequent VA show the similar core anger, hostility, and aggression-related deficits as those with IED, with comparable levels of psychosocial impairment as a result.

Past researchers have argued that there are "compelling proposals for an increased representation of disorders of dyscontrolled anger, hostility, and aggression" [Widiger and Sankus, 2000, p 393]. The finding that VA participants showed significantly poorer psychosocial functioning than PD participants argues for the inclusion of VA as a form of pathological aggression. Furthermore, the similarity between VA and IED groups on measures of anger and aggression support the proposal by Coccaro [2003] that frequent VA be subsumed under the IED rubric. Others have argued that anger, rather than aggression per se, should be the core feature of a disorder cluster that would include anger with and without aggression as specific disorders within that cluster [Deffenbacher, 2003]. Although the current study demonstrated co-variation of anger and impulsive aggression, it did not discriminate between angry groups with and without impulsive aggression. Future research will be needed to determine if anger dysregulation in the absence of impulsive aggression results in similar levels of psychosocial impairment as IED.

The VA group did not differ from the IED or PD group in level of Axis I or Axis II psychopathology, thus the results are not simply a function of general co-morbid psychopathology. However, the large majority of participants in the VA group did receive at least one DSM-IV diagnosis. Thus, it is possible that these results are limited to highly verbally aggressive individuals with co-existing psychopathology. Although an examination of verbally aggressive individuals with no co-existing psychopathology is worthy of future study, it is likely that such individuals represent a relatively small proportion of the clinically aggressive population. Hence, participant recruitment and identification would be the one challenge faced in conducting such a study.

Where IED does seem to differ from VA (other than physical aggression) is the breadth of deficits less directly associated with aggression. The IED group, but not the VA group, reported greater trait aggressiveness, non-anger emotional lability, and impulsiveness than PD participants. The IED and VA groups also directly differed in impulsivity, and anxiety/depression lability, with IED subjects showing more of each. Thus, impulsiveness and more global deficits in affective lability may be associated with physical aggression. This would help explain the inconsistent findings relating impulsiveness and IED [Best et al., 2002; Coccaro et al., 1998]. An argument could be made that the heterogeneity of the "impulsiveness" construct across measures [Evenden, 1999] is more likely to be responsible for inconsistency in impulsiveness findings for IED. However, the relationship between IED and general impulsiveness has been ephemeral even when the same measure of impulsiveness (e.g., BIS) has been used [Best et al., 2002; Coccaro et al., 1998].

The lack of a difference between VA and PD groups on the BPAQ VA scale was surprising, and inconsistent with the significant differences between VA and PD groups on behavioral (TAP) and interview (LHA-AS) measures of aggression. Only two of the five items on the BPAQ VA scale directly ask about arguments. The other three items ask about the likelihood to disagree with/express displeasure with someone, which may be more related to how opinionated and contrary an individual is than how aggressive they are per se.

The study findings are preliminary, as the sample size was small, thus possibly obscuring important differences between IED and VA groups. The small sample also prevented the current study from differentiating between participants meeting DSM-IV IED criteria with only physical aggression from those with both physical and VA. However, IED with only physical aggression is very rare [Coccaro, 2003]. Furthermore, though IED and VA subjects did not differ with regard to education, both groups were relatively well educated. Further research is needed to assess how these results would generalize to less educated samples. Finally, overall psychosocial impairment was assessed only via a GAF score. The use of multidimensional quality of life scales and/or objective data (i.e., number of arrests) may delineate differential patterns of psychosocial functioning among potential IED subgroups not captured by the GAF.

Despite the limitations, the study's results have important clinical implications, namely that VA represents a clinically significant aggression problem comparable in severity (if not breadth) to DSM-IV IED. For this reason, VA warrants clinical diagnosis and treatment either within the IED criteria or as a separate diagnosis. Considering the overlap of VA and IED, and the fact that IED criteria already exist that include VA, the former seems the more logical choice. Of course, broadening the scope of any diagnostic criteria set will often result in the identification of more "cases." Hence, additional research is needed to determine if inclusion of VA adds value to the construct of IED overall, or if it is better conceptualized as a subtype of IED. Furthermore, research is needed to determine if other aggression variants (i.e., relational aggression), or chronic anger in the absence of aggression, warrant diagnostic consideration, either within the IED rubric or as an associated disorder in future iterations of the DSM.

It can be argued that since almost all of the individuals diagnosed with VA already meet criteria for another mental disorder, little is gained by "piling on" another diagnosis. However, none of the co-morbid personality disorders in the VA group included criteria that addressed the participants' verbal aggressiveness (remember, no participants in the VA group had either borderline or antisocial personality disorder). Also, remember that by definition participants in the VA group reported VA that occurred independent of any other Axis I disorder. Thus, including VA under the rubric of IED provides the clinician with a treatment focus for another area of dyscontrolled maladaptivity, which is a defining feature of a mental disorder [Widiger and Sankus, 2000].

With respect to treatment, there exist few empirically supported interventions for IED, and, to the best of our knowledge, none exist specifically for VA. It is not yet known whether the few existing treatments for IED will be applicable to individuals with clinical levels of VA. Inclusion of VA as part of a diagnostic criteria set, and possibly as a subtype of the IED spectrum, could potentially help researchers design more efficacious treatments for individuals exhibiting clinical manifestations of aggression along the IED spectrum. Current research in our laboratory is exploring the efficacy of a manualized treatment for individuals with IED-IR (with and without physical aggression), which will serve as a stepping-stone toward determination of possible differential efficacy in treating these IED variants.

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