



Social desirability, deceptive reporting, and awareness of problematic aggression in intermittent explosive disorder compared with non-aggressive healthy and psychiatric controls

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ABSTRACT

Individuals with DSM-5 Intermittent Explosive Disorder (IED) are often suspected of minimizing the nature of their recurrent, problematic, impulsive aggressive behavior due to the social undesirability of these behaviors. Our first study involved 400 study participants categorized as Healthy Controls (HC), Psychiatric Controls (PC) and as having IED and included the Crowne-Marlowe Social Desirability Scale (SDS), the Lie Scale from the Eysenck Personality Questionnaire-Revised (EPQ-R Lie), and the Readiness to Change (Anger) Questionnaire (RTC). IED study participants had lower SDS and lower EPQ-R Lie scores, while having higher RTC scores, compared with both HC and PC study participants. Thus, when studied in a clinical research setting, IED study participants do not provide socially desirable answers to questions and do not engaging in deceptive reporting; likely because they have recognized their need/interest in reducing their own impulsive aggressive behavior. The second study, part of a family study of 70 probands and their first-degree relatives revealed a very high positive (96.3%), but substantially lower negative (55.8%), predictive power for IED based on informant report. This suggests that, while interview of close informants can confirm the diagnosis of IED, informant interviews cannot rule out IED when such informants provide a negative report.

1. Introduction

The DSM-5 characterizes Intermittent Explosive Disorder (IED) as the presence of recurrent impulsive aggressive outbursts associated with distress and psychosocial dysfunction not better explained by other disorders or conditions (Coccaro, 2012; American Psychiatric Association, 2013). The body of evidence for the validity of IED as a diagnostic representation of problematic impulsive/affective aggression has grown over the last two decades (Coccaro et al., 2017) and the management and intervention of impulsive aggression remains of significant clinical and social relevance (Heise et al., 1994; Olson 2004; Olvera 2002). Despite this, the low incidence of IED presenting for treatment in clinical settings (Coccaro et al., 2005; Hawkins and Cougle, 2011; Kessler et al., 2006) in conjunction with the social undesirability of impulsive aggression have led some to question, among other issues (Zapata and Palacio, 2016), whether the information individuals with IED provide during evaluation and treatment underestimates their degree of impulsive aggression. This is critical because, apart from the associated experiences of interpersonal guilt, impulsive aggressive behaviors are socially undesirable in and of themselves

(Olson 2004; Piquero et al., 2014). Accordingly, extant investigations of IED have sometimes been critiqued for using data that comes only from the individual with IED, who may minimize aspects of their behavior, or who may fail to disclose relevant diagnostic information. While some investigations have explored the dispensability of self- or clinician-reports altogether, these studies, at the same time, provide evidence that both sources provide clinically useful information in generating a diagnosis (e.g., Uher et al., 2012). Another potential method is archival records of violence (e.g. arrests for violent behavior). However, even among individuals with clinically pathologic aggression, most report little formal history of legal issues (Kulper et al., 2015), highlighting the lack of sensitivity of archival records.

A further methodological consideration is that subjects choosing to participate in research on aggression, as for any topic, may do so for interests beyond scientific inquiry. Motivations for research participation can vary widely (Nappo et al., 2013). Initially, curiosity motivates many subjects to participate in clinical research (Castillo et al., 2012), though motivations often shift to those of altruism and/or personal gain. That said, most investigations of social-behavioral phenomena require interview and/or questionnaire based data collection to varying

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degrees. Such methods rely on the willingness and ability of respondents to answer honestly. This limitation is of particular relevance to those who may display otherwise socially undesirable behavior (Levine et al., 2003; Piquero et al., 2014). However, while some areas of investigation are adopting new technologies (e.g., Newman et al., 2002) and assessment tools (e.g., Sandvik et al., 1993) to strengthen, and in some cases, bypass (e.g., Nock et al., 2010), the use of such data, self-report interviews and questionnaires remain among the primary methods of inquiry in social and biomedical research. Thus, the accuracy of patient responses can be appropriately questioned in the empirical study of symptoms that are typically considered socially undesirable and it behooves researchers to evaluate the veracity and reliability of information collected in the context of studying socially undesirable behaviors.

The present paper explores response biases on assessments involving self-disclosure among participants with and without DSM-5 IED. In Study 1, we assessed the tendency of study participants to show an explicit (i.e. social desirability) and/or more implicit / subtle (i.e. deception) positive response biases. In addition, we assessed “readiness to change” one’s own problematic anger in order to gauge whether such impulsive aggressive behavior was viewed as ego-syntonic or ego-dys-tonic. We hypothesized that study participants with DSM-5 IED, recruited from the community, would display equal (or lower) scores on measures of social desirability, deceptive reporting, and higher scores regarding readiness to change in terms of problematic anger, compared with healthy and psychiatric controls. In Study 2, as a complementary approach to the question of behavioral minimalization among those with IED, we examined the level of agreement between study participants (probands) and corroborating sources (informants) regarding the specificity and sensitivity of the subject’s symptom reports and diagnosis specifically for IED and for other DSM-5 disorders for comparison purposes. We hypothesized that the diagnosis of IED based on our direct interviews would display high specificity with IED diagnoses based on interviews with first-degree family informants.

2. Study 1

2.1. Methods

2.1.1. Study participants

Four-hundred adult individuals participated in Study 1. All participants were physically healthy and were systematically evaluated in regard to aggressive and other behaviors as part of a larger program designed to study correlates of impulsive aggressive, and other personality-related, behaviors in human participants. Participants were recruited through public service announcements, newspaper, and other media, advertisements seeking out individuals who: a) reported psychosocial difficulty related to anger or, b) had little evidence of

psychopathology. Participants were recruited until we had 100 healthy control, 100 psychiatric control, and 200 DSM-5 IED study participants; a sample size designed to have 80% power to detect a small-sized effect (e.g., $f \leq 0.15$) between IED and control study participants at an alpha level of 0.05. All study participants gave informed consent and signed the informed consent document approved by our Institutional Review Board.

2.1.2. Diagnostic assessment

Psychiatric diagnoses were made according to DSM-5 criteria (American Psychiatric Association, 2013). Diagnoses were made using information from: (a) the Structured Clinical Interview for DSM Diagnoses (SCID-I; First et al., 1995) for syndromal (formally Axis I) disorders and the Structured Interview for the Diagnosis of Personality Disorder (Pfohl et al., 1997) for personality (formally Axis II) disorders; (b) clinical interview by a research psychiatrist; and, (c) review of all other available clinical data. Research diagnostic interviews were conducted by individuals with a masters, or doctorate, degree in Clinical Psychology. All diagnostic raters went through a rigorous training program that included lectures on DSM diagnoses and rating systems, videos of expert raters conducting SCID/SIDP interviews, and practice interviews and ratings until the rater were deemed reliable with the trainer. This process resulted in good to excellent inter-rater reliabilities (mean kappa of 0.84 ± 0.05 ; range: 0.79–0.93) across anxiety, mood, substance use, impulse control, and personality disorders. Final diagnoses were assigned by team best-estimate consensus procedures involving research psychiatrists and clinical psychologists (Coccaro et al., 2012). While information for assigning syndromal diagnoses were collected through the use of the SCID-1, more than sufficient information from was available to update syndromal diagnoses from DSM-IV to those of DSM-5; DSM-5 diagnoses for personality disorder, based on the SIDP, are the same for DSM-IV. Finally, participants with a current history of a substance use disorder or a life history of bipolar disorder, schizophrenia (or other psychotic disorder), or mental retardation were excluded from study, because, by definition, IED participants cannot have such comorbidity.

One-hundred participants had no evidence of any psychiatric diagnosis (Healthy Controls: HC); one-hundred participants met criteria for a lifetime diagnosis of a syndromal psychiatric disorder or personality disorder other than IED (Psychiatric Controls: PC), and two-hundred participants met criteria for a current DSM-5 diagnosis of intermittent explosive disorder. Of the three hundred participants with a psychiatric history, most ($n = 220$, 73.3%), subjects reported a history of behavioral disturbance during which the subject, or others, thought they should have sought mental health services but did not, and 59% subjects reported a history of formal psychiatric evaluation and/or treatment. Prevalence of syndromal and personality disorder diagnoses are listed in Table 1.

Table 1
Demographic, functional, and psychometric characteristics of Study 1 participants.

	HC (N = 100)	PC (N = 100)	IED (N = 200)	P*	Group Differences
<i>Demographic variables</i>					
Age	31.3 \pm 8.8	34.4 \pm 10.0	37.7 \pm 9.7	< 0.001	HC < PC < IED ^a
Gender (% Male)	50.0%	51.0%	52.5%	= 0.914	HC = PC = IED ^b
Race (% White)	62.0%	62.0%	54.0%	= 0.173	HC = PC = IED ^b
SES score	44.5 \pm 12.8	37.4 \pm 15.7	38.6 \pm 13.0	< 0.001	HC > PC > IED ^a
<i>Psychosocial function</i>					
GAF score	83.1 \pm 5.0	68.2 \pm 12.0	55.9 \pm 9.0	< 0.001	HC > PC > IED ^a
<i>Psychometric variables</i>					
Aggression: LHA	5.0 \pm 3.5	8.4 \pm 4.9	18.4 \pm 4.2	< 0.001	IED > PC > HC ^a
Aggression: BPA	29.6 \pm 10.7	32.8 \pm 10.7	44.9 \pm 12.7	< 0.001	IED > PC > HC ^a
Impulsivity: LHIB	23.9 \pm 16.9	37.2 \pm 19.6	54.3 \pm 18.8	< 0.001	IED > PC > HC ^a
Impulsivity: BIS-11	55.0 \pm 16.9	62.5 \pm 10.6	68.6 \pm 11.3	< 0.001	IED > PC > HC ^a

^a By Chi-Square.

^b by ANCOVA with demographic variables as covariates.

Table 2
Syndromal and personality disorder diagnoses among Study 1 participants.

	PC (N = 100)	IED (N = 200)	P
<i>Lifetime syndromal disorders:</i>			
Any depressive disorder	9 (39.0%)	124 (62.0%)	< 0.001**
Any anxiety disorder	17 (17.0%)	64 (32.0%)	= 0.006
Any substance use disorder	38 (38.0%)	107 (53.5%)	= 0.014
Stress and trauma disorders	14 (14.0%)	43 (21.5%)	= 0.159
Obsessive-compulsive disorders	4 (4.0%)	10 (5.0%)	= 0.781
Eating disorders	5 (5.0%)	21 (10.5%)	= 0.131
Somatoform disorders	0 (0.0%)	4 (2.0%)	= 0.305
Non-IED impulse control disorders	0 (0.0%)	11 (5.5%)	= 0.018
<i>Personality disorders:</i>			
Cluster A (Odd)	38 (8.7%)	117 (18.0%)	< 0.001**
Cluster B (Dramatic)	89 (20.4%)	314 (48.2%)	< 0.001**
Cluster C (Anxious)	108 (24.8%)	173 (26.6%)	< 0.525
PD-NOS	125 (28.7%)	202 (31.0%)	< 0.419

* $p < 0.05$ after correction for multiple comparisons (uncorrected $p < 0.005$).

2.1.3. Assessment of aggression and impulsivity

Aggression was assessed with the Aggression score from the Life History of Aggression assessment (LHA; Coccaro et al., 1997) and the Aggression (Physical and Verbal) sub-score from the from the Buss-Perry Aggression questionnaire (BPA; Buss and Perry 1992). The LHA assesses history of actual aggressive behavior and BPA assesses aggressive tendencies as a personality trait. Impulsivity was assessed by the Life History of Impulsive Behavior (LHIB; Coccaro and Schmidt-Kaplan, 2012) and Barratt Impulsivity Scale (BIS-11; Patton et al., 1995). The LHIB assesses the number of times a person has engaged in impulsive behavior while the BIS-11 assesses the person's tendency to act impulsively as a personality trait. Each assessment has good to excellent psychometric properties.

2.1.4. Assessment of social desirability, deceptive reporting, and readiness to change

Social desirability was assessed using the Crowne-Marlowe Social Desirability Scale (SDS; Crowne and Marlowe, 1960); deceptive reporting by the "Lie" scale from the Eysenck Personality Questionnaire-Revised (EPQ-R; Eysenck and Eysenck, 1991); and, awareness of problematic aggression (and the need to reduce aggression) was assessed by the Readiness to Change (RTC; Prochaska et al., 1992) assessment adapted for impulsive aggression as the problematic behavior in question. The SDS is a twenty item true-false questionnaire of socially desirable (e.g., "I am always courteous, even to people who are disagreeable"), or undesirable (e.g., here have been occasions when I felt like smashing things"), statements. The Cronbach α for the SDS score in this sample was 0.84. The EPQ-R Lie scale is a 21 item true-false subscale from the 100 item EPQ-R. Each item makes a statement that is true, or false, for nearly all individuals (e.g., "Have you ever blamed someone for something you knew was really your fault?"). Higher scores reflect increasing deceptive reporting to the examiner about their general behavior. The Cronbach α for the EPQ-R Lie score in this sample was 0.83. The RTC is a 32 item questionnaire inquiring about an individual's readiness to address his/her problematic behaviors (e.g., "I have an anger problem and I really think I should work on it") and is scored on a five-point Likert scale (1 = "Rarely or Never" to 5 = "Almost Always or Always"). Higher scores reflect a person's awareness of their anger as a problem and a readiness/interest to address the problem. The Cronbach α for the RTC score in this sample was 0.95.

2.1.5. Other assessments

Socioeconomic status (SES) was assessed with using Hollingshead SES methodology (Hollingshead, 1975). Highest level of psychosocial function during the previous year was assessed during the diagnostic assessment using the Global Assessment of Function (GAF; Jones et al., 1995) scale.

2.1.6. Compensation for study participation

Each study participant received \$12 per hour of time involved in completing diagnostic interviews and questionnaire assessments.

2.1.7. Statistical analysis

Comparisons of between-group variables were performed using both parametric and non-parametric assessments. Comparisons between the diagnostic (IED and PC) groups were performed using Chi-Square (χ^2) tests assessing group differences on gender, race and prevalence of psychiatric diagnoses, with post-hoc Chi-Square ($df = 1$) when needed. Analyses of variance and covariance (ANOVA/ANCOVA) and post-hoc Tukey HSD tests assessed other demographic and psychometric (aggression and impulsivity) variables. Indices of response bias were assessed using analysis of covariance (ANCOVA), controlling for age and socioeconomic status. A two-tailed alpha (α) 0.05 was used to denote statistical significance for all analyses.

3. Results

3.1. Sample characteristics

The three groups differed modestly, but significantly, in age and socioeconomic score but not in distribution of sex or ethnicity (Table 1). Age was highest among IED, next highest among PC, and lowest among HC, study participants. SES scores were lowest among IED, next lowest among PC, and highest among HC, study participants. Thus, subsequent analyses controlled for any influence the demographic differences could play in these results. IED study participants also had lower GAF scores compared with the scores among PC study participants, who had lower GAF scores compared with HC study participants. The reverse pattern was observed for measures of aggression (LHA/BPA), and of impulsivity (LHIB/BIS-11), scores compared with HC and PC. Finally, IED and PC groups differed significantly in the presence of lifetime mood disorders, and in the presence of Cluster B personality disorders; all other comorbidity rates between IED and PC diagnostic groups were not significant. Details on the diagnostic characteristics of the sample are listed in Table 2.

3.2. Social desirability, deceptive reporting, and readiness for change of impulsive aggressive behavior

ANCOVAs conducted on SDS, EPQ-R Lie, and RTC scores revealed that the first three variables were significantly lower, and the RTC scores were significantly higher, among IED participants, compared with HC and PC participants; Fig. 1. Correlations between the three variables were statistically significant with the strongest relationship observed between SDS and EPQ-R Lie scores ($r = 0.67$, $p < 0.001$). Next, were the inverse relationships between RTC and SDS ($r = -0.37$, $p < 0.001$), and between RTC and EPQ-R Lie ($r = -0.20$, $p < 0.001$), scores.

4. Discussion

As described above, clinical research study participants may exaggerate or minimize their symptoms for a number of reasons, including adjusting in service of adhering to social norms, or minimizing their own behavior. Presumably, those who minimize their reports of their behavior would do so if the behavior has not caused a level of subjective distress that would warrant seeking support. The data from Study 1 suggest that IED study participants have less of a tendency towards socially desirable responding and deceptive reporting than comparison study participants.

These results were thematically consistent across the three measures of interest and add strength to the nature of the findings since no measure shared more than 45% of the variance with any other measure. In fact, the relationship between RTC and SDS, or EPQ-R Lie, scores

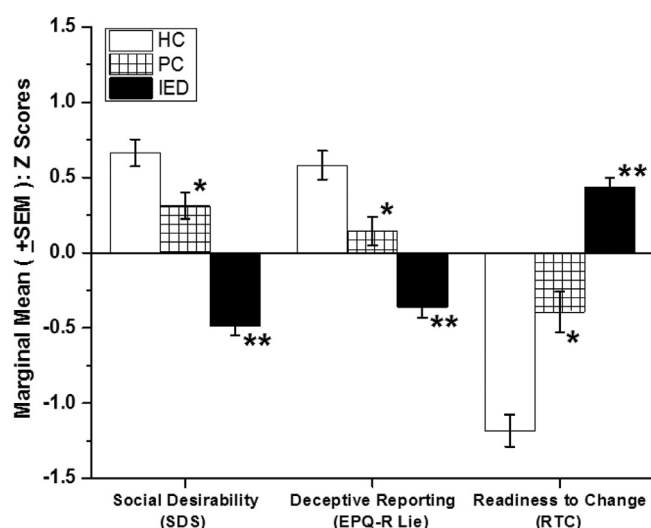


Fig. 1. Marginal means (\pm SEM) for Z-Scores for ANCOVA for social desirability (SDS), deceptive reporting (EPQ-R Lie), and readiness to change (RTC) scores as a function of belonging to the DSM-5 IED, PC, and HC groups. Z-scores were used in order to more easily display the different assessments on the same scale. A single asterisk (*) signifies p value ≤ 0.001 between PC compared with HC; double asterisk (**) signifies p value ≤ 0.001 between IED compared with PC and HC.

shared less than 14% of the variance indicating that most of the variance in RTC scores was independent of SDS or EPQ-R Lie scores. Thus, IED study participants clearly display meaningful differences in social desirability, deceptive reporting, and readiness to change.

These results also suggest that clinical research subjects who meet DSM-5 criteria for IED are less likely to adapt their responses in an appeal to social desirability, and to minimize socially undesirable responses, than Non-IED study participants. Consistent with this is the observation that these IED study participants were clearly aware that their impulsive aggressive behavior was a problem in their lives as evidenced by higher readiness to change scores than either PC or HC study participants.

5. Study 2

The purpose of Study 2 was to examine the level of concordance between proband and informant information regarding psychiatric diagnoses in the proband in a family study of IED. All study participants were recruited in the same fashion as in Study 1 and all probands and informants gave informed consent and signed the informed consent document approved by our Institutional Review Board.

5.1. Methods

5.1.1. Study participants

Study 2 involved 70 probands and 70 informants of those probands collected in the context of a family study of IED. Informants were all first-degree relatives (47.1% were parents, 38.6% were siblings, and 14.3% were offspring). Only first-degree relatives were used as informants because, unlike close friends or partners, these individuals grew up with, continued to interact with, and knew the proband for many years in several different contexts.

5.1.2. Diagnostic assessment

Diagnostic assessment was carried out as described in Study 1. In addition, probands and informants were interviewed by separate diagnostic assessors blind to the diagnostic information of the corresponding study participant. Final diagnoses were assigned by team best-estimate consensus procedures involving research psychiatrists and

clinical psychologists as described above. Discussion of the diagnoses by proband and informant interview, during best estimate conferences, were also blinded and took place over separate best estimate conferences eliminating the chance that discussion of the proband's case would not affect the discussion of the informant's case. Forty-six probands were given a best estimate diagnosis of IED; the 24 remaining probands were negative for IED, though positive for another psychiatric disorder in many cases (Table 4).

5.1.3. Assessments included in Study 2

The assessment of aggression and impulsivity in Study 2 were the same as in Study 1.

5.1.4. Statistical analysis

Statistical procedures included Chi-square (or Fisher's Exact Test when cells were ≤ 5), and t -tests were used to compare IED and control groups on demographic, diagnostic, and psychosocial/psychometric variables. A two-tailed alpha value of 0.05 was used to denote statistical significance for all analyses. In addition, sensitivity and specificity, and positive (PPP), and negative (NPP) predictive power were performed regarding the concordance of specific diagnoses made in probands and informants.

6. Results

6.1. Sample characteristics

Table 3 displays the demographic characteristics of the DSM-5 IED and Non-IED Control group and Table 4 displays the best-estimate diagnoses for the 70 probands in Study 2. The two groups differed modestly in socioeconomic score only but not in age or in distribution of sex or ethnicity (Table 3). As in Study 1, IED study participants had lower GAF, and higher aggression (LHA/BPA), and impulsivity (LHIB/BIS-11), scores compared with Non-IED study participants. Finally, and as in Study 1, IED and Non-IED study participants differed significantly in the presence of lifetime mood disorders, lifetime substance use disorders, and in the presence of Cluster B personality disorders; all other comorbidity rates between IED and Non-IED groups were not statistically significant.

6.2. Proband/Informant concordance of diagnosis for DSM-5 IED

The sensitivity (ability to correctly identify the diagnosis) of a DSM-5 IED diagnosis by the informant, compared to the proband (as the standard), was 57.8%, and the specificity was 96.0% with positive and negative predictive power at 96.3% and 55.8%, respectively. (Of note, only one case was observed in which a positive report of IED by the

Table 3

Demographic, functional, and psychometric characteristics of Study 2 participants.

	Controls (N = 24)	IED (N = 46)	p^*
<i>Demographic variables</i>			
Age	36.6 \pm 9.5	39.1 \pm 11.4	= 0.372 ^a
Gender (% Female)	70.8%	65.2%	= 0.790 ^b
Race (% White)	54.2%	65.2%	= 0.655 ^b
SES score	40.9 \pm 12.9	38.9 \pm 13.7	< 0.001 ^a
<i>Psychosocial function</i>			
GAF score	69.6 \pm 16.6	51.5 \pm 9.1	< 0.001 ^a
<i>Psychometric variables</i>			
Aggression: LHA	6.9 \pm 4.2	17.3 \pm 4.4	< 0.001 ^a
Aggression: BPA	29.9 \pm 8.4	40.8 \pm 13.1	< 0.001 ^a
Impulsivity: LHIB	31.6 \pm 13.7	55.0 \pm 17.3	< 0.001 ^a
Impulsivity: BIS-11	60.5 \pm 9.6	69.3 \pm 13.0	< 0.001 ^a

^a By Chi-Square.

^b by ANCOVA with demographic variables as covariates.

Table 4

Lifetime syndromal and personality disorder diagnoses among Study 2 participants.

	Controls (N = 24)	IED (N = 46)	P
<i>Lifetime syndromal disorders:</i>			
Any depressive disorder	10 (41.7%)	38 (82.6%)	= 0.001**
Any anxiety disorder	2 (8.3%)	17 (37.0%)	= 0.011
Any substance use disorder	4 (16.7%)	38 (82.6%)	< 0.001**
Stress and trauma disorders	5 (20.8%)	11 (23.9%)	= 0.999
Obsessive-compulsive disorders	1 (4.2%)	3 (6.5%)	= 0.999
Eating disorders	4 (16.7%)	9 (19.6%)	= 0.999
Somatiform disorders	0 (0.0%)	2 (4.3%)	= 0.543
Non-IED impulse control disorders	0 (0.0%)	2 (4.3%)	= 0.543
<i>Personality disorders:</i>			
Cluster A (Odd)	0 (0.0%)	10 (21.7%)	= 0.012
Cluster B (Dramatic)	6 (25.0%)	32 (69.6%)	= 0.001**
Cluster C (Anxious)	3 (12.5%)	18 (39.1%)	= 0.028
PD-NOS	3 (12.5%)	9 (19.6%)	= 0.526

* $p < 0.05$ after correction for multiple comparisons (uncorrected $p < 0.005$).

relative was denied by the proband.) Comparative values for these parameters for depressive, anxiety, and substance use disorders were similar and are shown in Table 5.

7. Discussion

Study 2 demonstrates that close informants confirm the presence, or absence, of a DSM-5 IED diagnosis in an IED proband with very high specificity, though with only moderate sensitivity. The high degree of specificity suggests that IED probands studied in a clinical research setting only rarely deny the presence of problematic, recurrent, impulsive aggressive behavior when it is clearly observable to outside individuals. The moderate degree of sensitivity, on the other hand, suggests that close informants are less able to provide enough information to make the DSM-5 diagnosis of IED, especially when the proband provides sufficient information to make that diagnosis. This was also the case for other diagnoses common in those with DSM-5 IED (i.e., depressive, anxiety, and substance use disorders) indicating that the sensitivity and specificity of the family study method in this study was similar across diagnoses.

8. Overall discussion

These data suggest that those with DSM-5 IED do not deny or minimize their impulsive aggressive symptomatology when evaluated in a clinical research program. This is likely because such individuals have already reached the contemplation stage at which point individuals have acknowledged their own problematic impulsive aggressive behavior and are seeking to more fully understand, and to obtain help for, their behavior. At such a point in time, denial and/or minimization, serves no purpose and, thus, such individuals will disclose socially undesirable information about themselves and their behavior to clinical research staff. In these cases the impulsive aggressive behaviors of these study participants are ego-dystonic.

This said the same may not apply to impulsive aggressive individuals referred for evaluation by an external party compelling them

to seek evaluation and treatment for their disruptive behavior. In these cases, impulsive aggressive behavior is ego-syntonic making it difficult for such individuals to freely disclose information that would paint them in an unfavorable light. In fact, individuals for whom an aggressive personality is an “asset” typically have a poor response to treatment. While not extensively studied in the field of human aggression, early lithium studies in prison inmates (Sheard 1971; Tupin et al., 1973) noted that impulsive aggressive individuals who were distressed by their behavior were accepting of lithium treatment while those who were not distressed by their behavior found lithium treatment to be unpleasant (i.e., it made them less of what they are, which is “aggressive”).

This study has its strengths and limitations. Its strengths include a sizable cohort of well described study participants using semi-structured interviews and other validated assessments, a multimodal assessment of aggression, impulsivity, and of social desirability, minimization, and stage of change, and a controlled study of informant data on IED and Non-IED probands. Limitations include the fact that this was a cross-sectional study, that there was variability in sociodemographic characteristics among the study participants, and that we did not have a group of IED individuals referred by others for a mandated evaluation. It is possible that our results could have been different if repeated at a later time but most of the assessments used are reliably trait-related assessments. Variability in sociodemographic characteristics was addressed by using these as covariates in all analyses where this could be done. Finally, as a non-forensic program, we did not have access to individuals mandated to see us for evaluation and treatment and who, therefore, may have had reason to minimize or deny their histories of impulsive aggressive behavior.

9. Conclusion

Individuals with DSM-5 IED self-referred for evaluation of their impulsive aggressive behavior do not appear to deny/minimize their impulsive aggressive symptomatology. At the point of presentation for evaluation and treatment, in fact, such individuals already acknowledge their own problematic impulsive aggressive behavior and, thus, willingly disclose socially undesirable information about themselves and their behavior. This is unlikely to be true for similar individuals referred by others for a mandated evaluation, although this study did not include such individuals.

Disclosures

Dr. Coccaro reports being a consultant to and being on the Scientific Advisory Boards of Azevan Pharmaceuticals, Inc. and of Avanir Pharmaceuticals, Inc., and being a current recipient of a grant award from the NIMH. Dr. Lee reports being a recipient of a grant award from Azevan Pharmaceuticals, Inc. Dr. McCloskey and Ms. Steakley-Freeman have nothing to disclose.

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Table 5

Concordance results for interviews of probands and informants in Study 2.

Disorder	Sensitivity	Specificity	Positive predictive power	Negative predictive power
Intermittent explosive disorder	57.8%	96.0%	96.3%	55.8%
Any depressive disorder	66.0%	90.0%	94.3%	51.4%
Any anxiety disorder	26.3%	94.1%	62.5%	77.4%
Any substance use disorder	50.0%	97.4%	94.1%	69.8%

(Dr. Coccaro).

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:[10.1016/j.psychres.2018.08.064](https://doi.org/10.1016/j.psychres.2018.08.064).

References

- American Psychiatric Association, 2013. Diagnostic and Statistical Manual of Mental Disorders, fifth ed. Washington, DC.
- Buss, A.H., Perry, M., 1992. The aggression questionnaire. *J. Pers. Soc. Psychol.* 63 (3), 452–459.
- Coccaro, E.F., Posternak, M.A., Zimmerman, M., 2005. Prevalence and features of intermittent explosive disorder in a clinical setting. *J. Clin. Psych.* 66 (10), 1221–1227.
- Coccaro, E.F., 2012. Intermittent explosive disorder as a disorder of impulsive aggression for DSM-5. *Am. J. Psych.* 169 (6), 577–588.
- Coccaro, E.F., Berman, M.E., Kavoussi, R.J., 1997. Assessment of life history of aggression: development and psychometric characteristics. *Psych. Res.* 73, 147–157.
- Coccaro, E.F., Fanning, J.R., Lee, R., 2017. Intermittent explosive disorder and substance use disorder: analysis of the national comorbidity survey replication sample. *J. Clin. Psych.* 78, 697–702.
- Coccaro, E.F., Naylor, H., McCloskey, M.S., 2012. Personality disorder-not otherwise specified evidence of validity and consideration for DSM-5. *Compr. Psychiatry* 53, 907–914.
- Coccaro, E.F., Schmidt-Kaplan, C.A., 2012. Life history of impulsive behavior: development and validation of a new questionnaire. *J. Psych. Res.* 46, 346–352.
- Castillo, A.G., Jandorf, L., Thélémaque, L.D., King, S., Duhamel, K., 2012. Reported benefits of participation in a research study. *J. Comm. Health* 37, 59–64.
- Crowne, D.P., Marlowe, D., 1960. A new scale of social desirability independent of psychopathology. *J. Consult. Psychol* 24 (4), 349–354.
- Eysenck, H.J., Eysenck, S.B.G., 1991. Manual of the Eysenck Personality Scales (EPS Adult). Hodder & Stoughton, London.
- First, M.B., Spitzer, R.L., Gibbon, M., Williams, J.B., 1995. Structured Clinical Interview For DSM-IV Axis I Disorders. New York State Psychiatric Institute, New York.
- Hawkins, K.A., Cougle, J.R., 2011. Anger problems across the anxiety disorders: findings from a population-based study. *Depress. Anxiety* 28 (2), 145–152.
- Heise, L., Pitanguy, H., Germain, A., 1994. Violence Against Women: The Hidden Health. pp. 255 World Bank Discussion Papers.
- Hollingshead, A.B., 1975. Four Factor Index of Social Status. Unpublished manuscript.
- Jones, S.H., Thornicroft, G., Coffey, M., Dunn, G., 1995. A brief mental health outcome scale- reliability and validity of the Global Assessment of Functioning (GAF). *Br. J. Psych.* 166 (5), 654–659.
- Kessler, R.C., Coccaro, E.F., Fava, M., Jaeger, S., Jin, R., Walters, E., 2006. The prevalence and correlates of DSM-IV intermittent explosive disorder in the National Comorbidity Survey Replication. *Arch. Gen. Psych.* 63 (6), 669–678.
- Kulper, D.A., Kleiman, E.M., McCloskey, M.S., Berman, M.E., Coccaro, E.F., 2015. The experience of aggressive outbursts in Intermittent Explosive Disorder. *Psych. Res.* 225 (3), 710–715.
- Levine, R.E., Radecki Breitkopf, C., Sierles, F.S., Camp, G., 2003. Complications associated with surveying medical student depression: the importance of anonymity. *Acad. Psych.* 27 (1), 12–18.
- Nappo, S.A., Iafra, G.B., Sanchez, Z.M., 2013. Motives for participating in a clinical research trial: a pilot study in Brazil. *BMC Public Health* 10 (January), 13–19.
- Newman, J.C., Des Jarlais, D.C., Turner, C.F., Gribble, J., Cooley, P., Paone, D., 2002. The differential effects of face-to-face and computer interview modes. *Am. J. Public Health* 92 (2), 294–297.
- Nock, M.K., Park, J.M., Finn, C.T., Deliberto, T.L., Dour, H.J., Banaji, M.R., 2010. Measuring the suicidal mind: implicit cognition predicts suicidal behavior. *Psychol. Sci.* 21 (4), 511–517.
- Olson, C.K., 2004. Media violence research and youth violence data: why do they conflict? *Acad. Psych.* 28 (2), 144–150.
- Olvera, R.L., 2002. Intermittent explosive disorder. *CNS Drugs* 16 (8), 517–526.
- Patton, J., Stanford, M., Barratt, E., 1995. Factor structure of the Barratt Impulsiveness Scale. *J. Clin. Psych.* 51, 768–774.
- Pfohl, B., Blum, N., Zimmerman, M., Department of Psychiatry, University of Iowa, 1997. Structured Interview for DSM-IV Personality Disorder: SIDP-IV. American Psychiatric Press, Washington, D.C.
- Piquero, A.R., Schubert, C.A., Brame, R., 2014. Comparing official and self-report records of offending across gender and race/ethnicity in a longitudinal study of serious youthful offenders. *J. Res. Crime Delinq.* 51 (4), 526–556.
- Prochaska, J.O., DiClemente, C.C., 1992. Stages of change in the modification of problem behaviors. In: Hersen, M., Eisler, R., Miller, P.M. (Eds.), *Progress in Behavior Modification* 28 Academic Press, New York.
- Sandvik, E., Diener, E., Seidlitz, L., 1993. Subjective well-being: the convergence and stability of self-report and non-self-report measures. *J. Person.* 61 (3), 317–342.
- Sheard, M.H., 1971. Effect of lithium on human aggression. *Nature* 230, 113–114.
- Tupin, J.P., Smith, D.B., Clanton, T.L., Kim, L.I., Nugent, A., Groupe, A., 1973. The long-term use of lithium in aggressive prisoners. *Compr. Psychiatry* 14 (4), 311–317.
- Uher, R., Perlis, R.H., Placentino, A., Dernovšek, M.Z., Henigsberg, N., Mors, O., et al., 2012. Self-report and clinician-rated measures of depression severity: can one replace the other? *Depress. Anxiety* 29 (12), 1043–1049.
- Zapata, J.P., Palacio, J.D., 2016. Intermittent explosive disorder: a controversial diagnosis. *Revista Colombiana de Psiquiatría* 45 (3), 214–223.