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## BRIEF REPORT

# Predictors of Treatment Outcome in Cognitive Behavioral Therapy for Intermittent Explosive Disorder: A Preliminary Analysis

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**Objective:** The present study examined potential treatment outcome predictors of a multicomponent cognitive behavioral intervention for intermittent explosive disorder (IED). **Method:** The sample ( $n = 64$ ; 22 female) consisted of individuals with a current diagnosis of IED that completed treatment across three study trials. Treatment outcome predictors assessed included demographic variables, psychiatric comorbidity, symptom severity, and treatment motivation/engagement. Treatment outcomes were (a) change in number of past-week aggressive acts from pretreatment to posttreatment and (b) presence of IED diagnosis at posttreatment. **Results:** Results indicated those who endorsed lower trait anger were more likely to remit from IED diagnosis at posttreatment. No other variables were found to significantly predict treatment outcome. **Conclusions:** These findings support the notion that cognitive behavioral therapy can be effective for a wide range of individuals with IED, with little variation in efficaciousness based on presence of demographic characteristics, comorbid disorders, or treatment motivation/engagement. This seems to be particularly the case for individuals with lower levels of trait anger.

### What is the public health significance of this article?

Findings from this study suggest that cognitive behavioral therapy can be an effective treatment for a wide range of individuals diagnosed with intermittent explosive disorder. Treatment efficacy appears to be unaffected by the presence of varying demographic characteristics, comorbid psychiatric disorders, and treatment motivation, though individuals with higher trait anger may require additional support to maximize treatment benefit.

**Keywords:** intermittent explosive disorder, treatment, aggression, anger, cognitive behavioral therapy

Intermittent explosive disorder (IED), which affects 3%–4% of the population (Coccaro & McCloskey, 2019), is the sole disorder in the *Diagnostic and Statistical Manual of Mental Disorders*, Fifth Edition (DSM-5; American Psychiatric Association, 2013) for which affective aggression is the defining characteristic. IED is associated with significant deleterious effects across legal, occupational, social, and physical health domains (Kulper et al., 2015; McCloskey et al., 2010). Despite this, there is a paucity of psychosocial intervention research for the condition.

McCloskey and colleagues implemented a 12-week cognitive restructuring, relaxation, and coping skills training (CRCST)

intervention for IED across three small clinical trials (McCloskey, 2023; McCloskey et al., 2008, 2022), wherein participants were randomized into either CRCST or a control condition of waitlist (McCloskey et al., 2008) or supportive psychotherapy (McCloskey et al., 2022; McCloskey, 2023). Results of these studies indicated that CRCST was superior to control conditions in reducing aggression. Though these results are promising indicators of CRCST as an efficacious treatment for IED, it remains unclear if there are individual- or treatment-level factors related to these favorable outcomes.

A rich literature on predictors of cognitive behavioral therapy (CBT) for other disorders suggests several possible factors that may

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Some of the data reported in this article have been previously published. The data reported in this article were collected as part of three separate randomized controlled trials which were conducted at two different study sites at three points in time. Only the intervention condition across the three

RCTs was used for analysis in the present study. Findings from the data collection have been reported in separate articles. Manuscript 1 (published) focuses on changes in aggression, anger, hostility, and depression throughout treatment compared with a waitlist control condition, while Manuscript 2 (published) focuses on changes in aggression, anger, hostility, depression, anxiety, social cognition, and quality of life throughout treatment as compared to a time- and dose-equated supportive psychotherapy control condition. Manuscript 3 (in preparation) also focuses on changes in aggression, anger, hostility, depression, anxiety, social cognition, and quality of life throughout treatment as compared to a time- and dose-equated supportive psychotherapy control condition, but at a different study site than that in

*continued*

influence efficacy including demographic variables (e.g., age; Fournier et al., 2009), premorbid symptom severity and functional impairment (Andreoli et al., 1989), presence of comorbid psychological disorders (Reich & Vasile, 1993), and motivational variables such as readiness for change (Scott & Wolfe, 2003). As such, the present study examined predictors of treatment outcome for individuals with IED using data from the three aforementioned CRCST trials. Treatment efficacy was measured at the symptomatic (frequency of aggressive acts) and diagnostic (IED remission) level. Predictors included demographic factors, comorbidity, symptom severity, and treatment motivation/engagement.

## Method

### Participants

Data from three randomized controlled trials of CRCST versus either waitlist control (McCloskey et al., 2008) or supportive psychotherapy (McCloskey, 2023; McCloskey et al., 2022) for IED were used in the present study. From these trials, 64 participants (22 female) between the ages of 21 and 55 years ( $M = 37.20$ ,  $SD = 9.87$ ) completed treatment, including 27 participants from the pilot study (McCloskey et al., 2008), and 15 (McCloskey et al., 2022) and 22 (McCloskey, 2023) participants from the two subsequent trials. All participants engaged voluntarily in treatment and met current integrated research criteria for IED (IED-IR; Coccaro, 2011), which was the basis for current DSM-5 IED criteria (American Psychiatric Association, 2013). Lifetime bipolar disorder, schizophrenia, delusional disorder, organic brain disorder, current substance dependence, and suicidal or homicidal ideation were exclusionary for all three studies, as well as current prescription of psychotropic medication and/or active participation in an anger management program. Current posttraumatic stress disorder was also exclusionary for the McCloskey (2023) study. All participants completed informed consent prior to the enrollment, and all protocols were approved by the institutional review board of the appropriate institution.

### Measures

*Intermittent Explosive Disorder Interview* (IED-I; Coccaro & McCloskey, 2004) is a semistructured interview used to diagnose IED-IR (Coccaro, 2011). Published studies have shown the IED-I to be a valid and reliable instrument (e.g., Kulper et al., 2015). The IED-I provides the diagnostic-level outcome variable examined. The IED-I was also used to calculate average number of aggressive acts per year as an index of baseline aggression severity.

*Overt Aggression Scale-Modified* (OAS-M; Coccaro et al., 1991) is a semistructured interview that assesses past-week aggression. A composite aggression score is determined by summing frequency of acts (i.e., verbal assault, assault against objects, and assault against others) of varying severity. The OAS-M has demonstrated strong interrater reliability (McCloskey & Coccaro, 2003). The aggression score represents the symptom-level outcome variable examined.

*Demographic Interview* was used to assess demographic variables including age, gender (female, male, other), race (Black/African American, White, Asian, Native American, other/multiracial), and years of education.

*Structured Clinical Interview for DSM-IV* (SCID; First et al., 1996) was used to assess syndromal (Axis I) disorder comorbidity at pretreatment based on DSM-IV criteria (American Psychiatric Association, 1994) and has demonstrated good reliability (Lobbestael et al., 2011).

*Structured Interview for DSM-IV Personality* (SID-P; Pfohl et al., 1995) was used to diagnose personality disorders at pretreatment based on DSM-IV criteria. The SID-P has demonstrated adequate interrater reliability (Damen et al., 2004).

*Global Assessment of Functioning* (GAF; Jones et al., 1995) is a standardized rating scale from 0 to 100 which was used to assess overall level of functioning at pretreatment. A GAF score was given by diagnosticians and confirmed in the best estimate procedure described above.

*State-Trait Anger Expression Inventory-2* (STAXI-2; Spielberger, 1999) is a 57-item self-report assessment that measures several subdomains of anger. For this study, only the trait anger scale was used. The STAXI-2 has been shown to be valid and internally consistent (Lievaart et al., 2016). In the current sample, the trait anger subscale had good internal consistency ( $\alpha = .84$ ).

*Stages of Change Questionnaire* (SCQ; McConaughy et al., 1983) is a 32-item measure of a client's readiness to change at pretreatment. The SCQ is adapted from the University of Rhode Island Change Assessment Scale, which has shown moderate to excellent reliability and validity (Dozois et al., 2004). Internal consistency for the current sample was excellent ( $\alpha = .90$ ).

*Attendance* was measured by number of therapy sessions out of 12 attended.

### Procedure

Participants completed a structured clinical interview and baseline self-report assessment measures prior to the treatment. A modified IED interview and self-report assessments were repeated at 1-week posttreatment. IED and comorbid diagnoses

Manuscripts 2 and 1. Manuscript 4 (the present article) focuses on how demographic factors (e.g., age, gender), baseline psychiatric comorbidity (e.g., mood disorders, substance use disorders), baseline symptom severity (e.g., trait anger, average yearly aggressive acts), and treatment motivation (e.g., baseline readiness to change, session attendance) predict treatment outcomes only in the CRCST condition across the three studies. Such analyses were not conducted in any of the component treatment studies, and most of the variables included as predictors in the regressions for the present study were not included in the analyses across the three individual treatment studies. Additionally, data from participants in the control conditions were not included in the present analyses. Thus, there is very little overlap in the analyses conducted, and limited data overlap, between the present study and any of the component studies.

Nicole K. Ciesinski played a lead role in data curation, formal analysis, software, validation, visualization, and writing—review and editing and an equal role in conceptualization and writing—original draft. Martha K. Zajac played a supporting role in data curation and writing—review and editing and an equal role in conceptualization and writing—original draft. Michael S. McCloskey played a lead role in funding acquisition, investigation, methodology, project administration, and supervision and a supporting role in conceptualization and writing—review and editing.

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were confirmed using a best estimate procedure (Klein et al., 1994), in which a diagnostic report for each participant is reviewed by a team of diagnosticians including a licensed clinical psychologist. This procedure yields strong interrater reliabilities ( $\kappa = .79-.93$ ) across psychiatric diagnoses (e.g., Klein et al., 1994).

The CRCST protocol was adapted from the Deffenbacher and McKay (2000) anger treatment manual. For the CRCST treatment, the first three sessions focused on relaxation training, sessions four and five focused on cognitive restructuring, and the remaining sessions focused on coping skills training, which involved practicing a combination of relaxation techniques, strategies to challenge anger distortions (e.g., describe the behavior, not the person), and general as well as anger-specific coping thoughts, during imaginal exposure to increasingly intense anger-provoking scenes. All studies utilized the same 12-session protocol of CRCST. Twelve participants received the intervention in a 75-min weekly group format (McCloskey et al., 2008). All others received the intervention as weekly 50-min individual sessions. All study therapists had at minimum of master's-level degree with 2 or more years of experience delivering CBT. Therapists were trained by a licensed clinical psychologist. Finally, treatment adherence was evaluated in each study using a manual modeled after the Collaborative Study Psychotherapy Rating Scale (CSPRS; Hill et al., 1992). Treatment adherence for the CRCST conditions across studies was high (i.e., >90%).

## Data Analytic Plan

Treatment outcome was measured by (a) change in past-week OAS-M aggression scores from pre- to posttreatment and (b) presence or absence of an IED diagnosis at posttreatment. The completer sample was analyzed. All variables in the analyses were examined for missingness and distribution. The only variables included in the analyses containing missing data were average yearly aggressive acts (2% missing), STAXI (3% missing), and SCQ (17% missing). These data were deemed missing at random. Average yearly aggressive acts were significantly skewed and included two outliers and thus was winsorized at 4 *SDs* and natural log transformed.

To assess simple associations (a) bivariate correlations were run for each predictor on OAS-M aggression change score and (b) *t* tests or chi-square analyses were conducted for each predictor on IED posttreatment diagnosis. Then, a separate regression was conducted for each of the predictor classes (i.e., demographics, comorbidity, symptom severity, treatment motivation/engagement), with each outcome as the dependent variable (linear and logistic regressions for OAS-M aggression change and IED diagnosis, respectively) to determine the independent relationship between the predictors in each class and treatment outcome. A familywise error correction was implemented ( $\alpha = .01$ ) to correct for increased Type I error rate due to running multiple models. Within each regression, if multiple significant ( $p < .01$ ) and/or nonsignificant trending ( $p < .05$ ) predictors were identified, they were entered into a subsequent regression to determine which variable(s) best predicted favorable outcomes at posttreatment.

## Results

### Preliminary Analyses

Table 1 includes descriptive data for each predictor variable. Bivariate correlations of each predictor indicated that years of

education ( $r = -.342, p = .007$ ) and identifying as Black ( $r = .303, p = .018$ ) were significantly correlated with aggression reduction. No other significant correlations were found ( $r = -.20$  to  $.20, p$ 's  $\geq .05$ ). With respect to the IED remission status, those with current IED at posttreatment were more likely to have a comorbid lifetime mood disorder:  $t(50) = -2.09, p = .042$ , completed fewer sessions:  $t(41) = 2.05, p = .047$ , and higher baseline trait anger:  $t(40) = -3.86, p < .001$ . Additionally, participants identifying as Black were more likely to remit from IED,  $t(62) = 2.598, p < .001$ , than those identifying as White,  $t(62) = -2.179, p < .001$ . However, one-way analyses of variance revealed no race-based differences in baseline symptom severity ( $F = .092-2.012, p$ 's  $\geq .10$ ). No other significant differences emerged ( $p$ 's  $> .07$ ).<sup>1</sup>

### Primary Analyses

#### Aggression Change

Results of the linear regressions found that no identified factors significantly predicted symptom reduction (Table 2).<sup>2</sup>

#### IED Diagnosis

The logistic regressions for each class of predictors demonstrated that lower baseline trait anger and identifying as Black were associated with a greater likelihood of remitting from IED at posttreatment. No other variables significantly predicted IED remission. When both significant predictors were entered into a single regression, trait anger remained significant, whereas identifying as Black was reduced to a nonsignificant trend (Table 3).

## Discussion

This study investigated predictors of CRCST treatment outcome for IED. Only trait anger emerged as a significant predictor of treatment outcome, particularly of IED nonremission at posttreatment. However, trait anger was not associated with aggression change, suggesting CRCST is still efficacious at reducing number of aggressive acts, even for those with high levels of trait anger. This is consistent with findings demonstrating that CRCST had a larger effect on aggressive acts than on anger (McCloskey et al., 2008, 2022). Thus, the continued diagnosis of IED may be due to the association between higher base levels of trait anger and greater current aggression resulting in insufficient decline in aggressive acts to constitute remission.

No comorbidity-related predictors emerged as significant. This was contrary to past treatment studies of other disorders that have shown smaller treatment effects for those with high levels of

<sup>1</sup> Baseline participant characteristics were probed across the three studies. Only GAF score and baseline aggression severity significantly differed across studies. Participants from the McCloskey et al. (2022) study had significantly greater ( $p = .036$ ) global impairment than did those in the McCloskey et al. (2008) study, and baseline aggression severity was higher ( $p = .002$ ) in the McCloskey et al. (2008) than in the McCloskey (2023) study.

<sup>2</sup> Analyses were also run on the intent-to-treat sample ( $n = 79$ ) using multiple imputation to impute missing values for the aggression symptom reduction outcome variable. The same pattern of results emerged with the exception of baseline aggression severity predicting symptom reduction ( $p < .01$ ), possibly owing to regression to the mean.

**Table 1***Descriptive Statistics by Analysis and Posttreatment IED Remission Status (n = 64)*

Class	Variable	<i>M (SD)/N (proportion)</i> Full sample	<i>M (SD)/N (proportion)</i>	
			IED remission (40)	No remission (24)
Demographics	Age	37.20 (9.87)	37.60 (11.07)	36.54 (7.63)
	Female	22 (34.4%)	15 (37.5%)	7 (29.2%)
	Black/African American	20 (31.3%)	17 (42.5%)	3 (12.5%)
	Asian/Native American <sup>a</sup>	4 (6.3%)	2 (5%)	2 (8.3%)
	White	40 (62.5%)	21 (52.5%)	19 (79.2%)
Comorbidity	Number of years of education	15.38 (1.98)	15.55 (1.89)	15.08 (2.12)
	Lifetime mood disorder	35 (54.7%)	18 (45%)	17 (70.8%)
	Lifetime anxiety disorder	18 (22.8%)	10 (25%)	5 (20.8%)
	Childhood disorder	21 (32.8%)	11 (27.5%)	10 (41.7%)
	Lifetime alcohol/substance use disorder	34 (53.1%)	18 (45%)	16 (66.7%)
	Additional lifetime syndromal disorder (Axis I)	10 (12.7%)	4 (10%)	5 (20.8%)
	Antisocial personality disorder	7 (10.9%)	4 (10%)	3 (12.5%)
	Borderline personality disorder	15 (23.4%)	7 (17.5%)	8 (33.3%)
	Additional personality disorder (Axis II)	45 (70.3%)	27 (67.5%)	18 (75%)
Symptom severity	ln (mean yearly aggressive acts)	3.38 (1.70)	3.46 (1.79)	3.24 (1.55)
	STAXI trait anger	27.40 (6.17)	25.13 (4.90)	31.00 (6.36)
	Level of functioning at entry (GAF)	58.39 (8.04)	58.85 (8.08)	57.63 (8.09)
Treatment motivation/engagement	Initial stage of change score (SCQ)	9.17 (2.2)	8.88 (2.14)	9.69 (2.27)
	Session attendance	10.93 (1.30)	11.2 (1.16)	10.5 (1.41)
Outcomes	IED posttreatment remission	40 (62.5%)	40 (62.5%)	
	Pre-post treatment aggression change (OAS-M)	31.39 (41.45)	31.85 (24.88)	30.63 (60.46)

*Note.* GAF = Global Assessment of Functioning score; IED = intermittent explosive disorder; OAS-M = Overt Aggression Scale-Modified; SCQ = Stage of Change Questionnaire; STAXI = State-Trait Anger Expression Inventory.

<sup>a</sup> Asian/Native American: Asian (*n* = 3), Native American (*n* = 1).

psychiatric comorbidity (e.g., Reich & Vasile, 1993). The lack of a relationship between psychiatric comorbidity and treatment outcome supports the ability of CRCST to treat patients diagnosed with IED in “real world” settings where psychological comorbidities are common.

Greater therapy attendance and pretreatment motivation to change were not associated with reductions in aggressive behavior

throughout treatment. This is surprising given prior research demonstrates that greater session attendance and readiness to change predict remission of pathological behavior (Norcross et al., 2011; Petry et al., 2006). As the current sample included only those who completed treatment (i.e., attended at least six sessions of CRCST), these findings bolster the efficacy of CRCST in that even moderate doses of CRCST have a similar effect on reduction

**Table 2***Predictors of Pre-to-Posttreatment Aggression Change (OAS-M) Outcome (n = 64)*

Class <sup>a</sup>	Predictor	<i>B</i>	<i>SE</i>	$\beta$	<i>t</i>	<i>p</i>	95% CI
Demographics <sup>b</sup>	Age	0.077	0.545	0.017	0.142	.888	[−1.038, 1.144]
	Gender	−11.341	11.728	−0.125	−0.967	.338	[−34.854, 12.173]
	Black/African American	21.212	12.114	0.230	1.751	.086	[−3.075, 45.499]
	Asian/Native American	−16.542	21.575	−0.098	−0.767	.447	[−59.797, 26.712]
	Education (years)	−5.309	2.711	−0.252	−1.916	.061	[−10.864, 0.247]
Comorbidity	Lifetime mood disorder	7.036	14.451	0.082	0.487	.628	[−21.975, 36.046]
	Lifetime anxiety disorder	−1.412	14.168	−0.014	−0.100	.921	[−29.856, 27.031]
	Childhood disorder	11.436	14.171	0.127	0.807	.423	[−17.014, 39.885]
	Lifetime alcohol/substance use disorder	1.834	11.703	0.022	0.157	.876	[−21.660, 25.329]
	Additional syndromal (Axis I) disorder	3.023	18.986	0.023	0.159	.874	[−35.094, 41.140]
	Antisocial personality disorder	12.431	23.130	0.088	0.537	.593	[−34.004, 58.867]
	Borderline personality disorder	21.741	15.955	0.212	1.363	.179	[−10.289, 53.771]
	Additional personality (Axis II) disorder	−13.011	15.083	−0.143	−0.863	.392	[−43.291, 17.269]
Symptom Severity	ln (mean yearly aggressive acts)	6.130	3.292	0.240	1.862	.068	[−0.470, 12.729]
	Level of functioning at entry (GAF)	−1.257	0.690	−0.235	−1.820	.074	[−2.640, 0.127]
	STAXI trait anger	−0.208	0.910	−0.030	−0.229	.820	[−2.032, 1.616]
Treatment motivation/engagement	Initial stage of change score (SCQ)	−00.650	2.940	−0.032	−0.221	.826	[−6.565, 5.265]
	Session attendance	1.542	5.067	0.045	0.304	.762	[−8.652, 11.736]

*Note.* CI = confidence interval; GAF = Global Assessment of Functioning score; SCQ = Stage of Change Questionnaire; OAS-M = Overt Aggression Scale-Modified; STAXI = State-Trait Anger Expression Inventory.

<sup>a</sup> Separate regressions were run for each class of predictors. <sup>b</sup> “White” was used as the reference group for the analyses of race.



**Table 3***Predictors of IED Diagnosis Outcome (n = 64)*

Class <sup>a</sup>	Predictor	<i>B</i>	<i>SE</i>	Wald	<i>p</i>	<i>OR</i>	95% CI
Demographics <sup>b</sup>	Age	−0.024	0.031	0.605	.437	0.976	[0.918, 1.038]
	Gender	0.089	0.633	0.020	.888	1.093	[0.316, 3.780]
	Black/African American	<b>−2.216</b>	<b>0.816</b>	<b>7.374</b>	<b>.007</b>	<b>0.109</b>	<b>[0.022, 0.540]</b>
	Asian/Native American	−0.070	1.112	0.004	.950	0.933	[0.105, 8.254]
	Education (years)	−0.300	0.173	2.997	.083	0.741	[0.567, 1.040]
Comorbidity	Lifetime mood disorder	0.900	0.675	1.780	.182	2.460	[0.656, 9.233]
	Lifetime anxiety disorder	−0.476	0.694	0.470	.493	0.621	[0.159, 2.422]
	Childhood disorder	0.617	0.695	0.790	.374	1.854	[0.475, 7.235]
	Lifetime alcohol/substance use disorder	0.759	0.582	1.705	.192	2.137	[0.684, 6.681]
	Additional syndromal (Axis I) disorder	0.623	0.882	0.500	.489	1.865	[0.331, 10.503]
	Antisocial personality disorder	−0.381	1.119	0.116	.734	0.683	[0.076, 6.127]
	Borderline personality disorder	0.579	0.772	0.564	.453	1.785	[0.393, 8.097]
	Additional personality (Axis II) disorder	−0.023	0.745	0.001	.976	0.978	[0.227, 4.214]
Symptom severity	ln (mean yearly aggressive acts)	−0.290	0.189	2.360	.125	0.748	[0.517, 1.083]
	Level of functioning at entry (GAF)	−0.044	0.040	1.241	.265	0.957	[0.885, 1.034]
	STAXI trait anger	<b>0.215</b>	<b>0.062</b>	<b>12.061</b>	<b>&lt;.001</b>	<b>1.240</b>	<b>[1.098, 1.400]</b>
Treatment motivation/engagement	Initial stage of change score (SCQ)	0.164	0.143	1.315	.251	1.179	[0.890, 1.561]
	Session attendance	−0.395	0.235	2.812	.094	0.674	[0.425, 1.069]

*Note.* Significant predictors ( $p < .01$ ) are bolded. IED = intermittent explosive disorder; *SE* = standard error; CI = confidence interval; GAF = Global Assessment of Functioning score; SCQ = Stage of Change Questionnaire; STAXI = State-Trait Anger Expression Inventory.

<sup>a</sup>Separate regressions were run for each class of predictors. <sup>b</sup>“White” was used as the reference group for the analyses of race.

of aggressive behavior as the full dose (i.e., 12 sessions). The completer sample could also obfuscate attendance and motivation effects via restriction of range, but an exploratory intent-to-treat analysis (Footnote 2) also found no effects of attendance or pretreatment motivation on treatment outcome. Though pretreatment willingness to change problematic behaviors did not appear to influence CRCST outcome, treatment motivation is dynamic and may have increased throughout treatment due to a variety of factors such as development of self-efficacy in behavioral change, which may have facilitated treatment motivation and engagement. Further research is needed to unpack the mechanisms by which these variables may influence treatment outcome for IED.

The present analyses demonstrated that participants identifying as Black were nonsignificantly more likely to remit from IED than other racial groups. This finding was surprising as CBT outcome studies typically show either no race-based differences (e.g., Carpenter et al., 2018) or poorer outcomes (e.g., less symptom reduction, lower retention rates) for individuals identifying with a racial minority (e.g., Windsor et al., 2015). This may be due to several factors including a lack of cultural adaptation of CBT to the client's specific ethnoracial values and culture (Horrell, 2008), traditional CBT's focus on the individual-level changes while ignoring the effect of environmental factors such as systemic prejudice and discrimination (David, 2009), and absence of multicultural training of therapists (Toporek & Pope-Davis, 2005), among others. In the present study, the treatment trials were conducted in diverse communities that afforded study therapists (all 13 of whom identified as Caucasian, with two also identifying as Hispanic) substantial prior experience working with racially diverse clients. This may have facilitated positive treatment outcomes despite the racial mismatch between client and therapist. Though admittedly post hoc, this is indirectly supported by high levels of working alliance for CRCST independent

of race (McCloskey et al., 2008, 2022). This nonsignificant trend for race merits further examination in future studies of CRCST. No other demographic predictors emerged as significant, indicating that CRCST is similarly effective for a variety of individuals despite mixed evidence of differences in IED prevalence and course among different demographic groups (Coccaro & McCloskey, 2019).

This is one of the first studies investigating predictors of psychotherapy treatment outcome for IED. Strengths include the incorporation of data from participants from three trials and the assessment of several predictors associated with CBT outcome in other clinical populations. However, it should be noted that only the completer sample was analyzed due to attrition, limiting generalizability of findings for all individuals who enter CRCST treatment for IED. Additionally, due to the nature of the available data, only the active treatment condition was examined in the analyses, thus leaving open the question of whether factors nonspecific to CRCST may have contributed to treatment outcomes. Individuals identifying as Asian ( $n = 3$ ) and Native American ( $n = 1$ ) were placed into the same category (Asian/Native American) for analytic purposes due to the small sample sizes and low power to detect significant effects between such race categories, limiting ability to investigate differences in treatment outcome for either Asian or Native American participants relative to those identifying with other races (e.g., White or Black/African American). Furthermore, both the sample size and the predictor variable list were limited, suggesting the need for replication in larger samples and including a wider range of potential predictors (e.g., affect lability). Relatedly, due to the nature of the sample (pathological aggressiveness), the range of scores for each outcome measure was limited which together with a relatively small sample size may have hampered the ability to identify significant predictors of treatment outcome with sufficient power. Finally, as there was no formal assessment of the CRCST materials and therapists for cultural competency, future research would benefit from

assessing the impact of cultural competency of the clinicians and treatment materials on treatment efficacy among individuals of varying racial/ethnic identities.

Overall, CRCST appears to be a broadly effective treatment for IED, though individuals with higher trait anger were more likely to maintain current IED diagnoses at posttreatment, suggesting that future iterations of CRCST could be tailored to include greater focus on anger reduction to better facilitate remission of IED. Finally, it was demonstrated that common treatment barriers such as comorbid psychiatric disorders or reduced motivation at treatment entry do not differentially predict treatment outcome, suggesting that CRCST may be an effective intervention for IED even with difficult-to-treat comorbidities and limited motivation to change at the outset of treatment. Given the significant personal and societal costs associated with the disorder, these are hopeful results for those who are seeking or providing treatment for IED.

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