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Defense styles in Intermittent Explosive Disorder

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ABSTRACT

The overreliance on immature and/or neurotic defense mechanisms, as opposed to more mature defensive functioning has been linked to several psychiatric disorders. However, to date, the role of defense styles among individuals with Intermittent Explosive Disorder (IED) has not been examined. Given that individuals with IED display difficulties controlling their anger and aggression, one might expect these individuals to exhibit more immature and less mature defense styles. The current study compared participants with IED to a personality disorder (PD) comparison group, as well as to healthy volunteers (HV) on the Defense Style Questionnaire, a self-report measure that assesses the extent to which individuals endorse using mature, immature, and neurotic defense styles. Subjects with IED had significantly higher scores than both comparison groups on immature defense styles and exhibited lower scores on mature defense mechanisms. Hierarchical regression of significant defense style subscales showed that higher levels of acting out and lower levels of sublimation uniquely discriminated participants with IED from the PD and HV comparison groups.

1. Introduction

Aggression is a pervasive, serious problem facing society today. Almost one in every five adults has engaged in physical assault (Robins and Regier, 1991), and nearly 1.2 million people between the age of 20 and 59 are treated annually in emergency rooms for assault-related injuries (Centers for Disease Control and Prevention [CDC], 2010). These aggressive behaviors cost tens to hundreds of billions of dollars annually in terms of medical care and lost productivity (Corso et al., 2007). In addition, recurrent acts of aggression are associated with distress and impairment for the aggressor, suffering among victims, and perpetuation via intergenerational transmission (Conger et al., 2003). These negative effects are even more pervasive for individuals who experience a recurrent and pathological form of aggression.

Intermittent Explosive Disorder (IED) is the only psychiatric disorder (*DSM-IV-TR*; American Psychiatric Association [APA], 2000) defined by excessive affective aggression. Individuals who meet criteria for IED engage in repeated acts of aggression that are disproportionate to any psychosocial stressor or provocation, anger based, and not better accounted for by the effects of a substance, medical condition, or other psychological disorder (APA, 2000). IED is associated with significant occupational and social impairment, including relationship problems, loss of work, and legal troubles as well as several negative physical health outcomes, including heart disease, stroke, lung disease, ulcers, and chronic pain (McCloskey et al., 2006, 2010).

Many of the global deficits and psychosocial impairments found in IED are also associated with personality disorders (PD), including impulsive aggression and affective instability (Sloan et al., 2010). In fact, IED has been shown to have significant comorbidity with personality disorders, particularly those associated with affect dysregulation (e.g. borderline personality disorder [BPD]; Coccaro, 2003; Kessler et al., 2006). Among subjects with personality disorders, increased aggression and affective instability were also linked to increased use of maladaptive defense mechanisms (e.g. acting out; Koenigsberg et al., 2001), which suggests that similar maladaptive defense functioning may be associated with IED. However, few studies have examined the way in which the affective instability inherent in disorders, such as IED, could be linked to particular defense mechanisms.

Defense mechanisms in traditional psychoanalytic theory represent unconscious psychological processes that distort reality to protect an individual from unacceptable thoughts or impulses (Freud, 1936). However, more recent conceptualizations have deemphasized protection from unacceptable thoughts, and focused more on how defense mechanisms reduce negative affect and

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maintain self-esteem (Cooper, 1998). Defense mechanisms can be grouped into defense "styles" based on a developmental continuum ranging from immature (e.g. denial) to somewhat mature/neurotic (e.g. undoing) to mature (e.g. sublimation; Andrews et al., 1993; Bond and Vaillant, 1986). Though the constellation of the defensive styles may vary somewhat across factor analyses (e.g. idealization being associated with image distorting and neurotic defense styles in separate studies; Andrews et al., 1993, Bond et al., 1983), literature supports the grouping of defense mechanism into styles that represent the same developmental level of adaptability and efficacy in handling stressors (e.g. sublimation and suppression both reduce distress without causing interpersonal difficulties or future distress; Andrews et al., 1993; Bond et al., 1983). Thus, defense styles represent an individual's tendency to use specific types of defense mechanisms, with individual defensive styles associated with several forms of psychopathology.

Increased use of the immature defense style has been found among individuals with psychiatric disorders (Bond and Vaillant, 1986; Calati et al., 2010; Porcerelli et al., 2009). Panic disorder and dysthymia are associated with over utilization of somatization and devaluation, while over use of isolation is only associated with dysthymia (Spinhoven and Kooiman, 1997). Further, major depressive disorder is associated with increased use of devaluation, dissociation, and isolation (Porcerelli et al., 2009). Individuals with a personality disorder (PD), especially borderline personality disorder (BPD), also show increased use of acting out, passive aggression, and projection as well as greater use of immature defenses overall (Zanarini et al., 2009). Among individuals with a PD, only acting out (when normal inhibitions to [e.g. not to aggress] are bypassed into immediate actions [e.g. aggression] without regard to the consequences) was significantly associated with both affective instability and impulsive aggression (Koenigsberg et al., 2001), suggesting that acting out may differentiate individuals with IED from other clinical populations.

Although healthy individuals tend to utilize neurotic defenses over immature defenses when dealing with conflict (e.g., using reaction formation when angry instead of acting out aggressively; Andrews et al., 1989; Vaillant, 2000), over utilization of the neurotic defense style is also associated with several psychiatric disorders (Bond, 2004; Calati et al., 2010; Spinhoven and Kooiman, 1997). Individuals with an anxiety disorder over utilize the neurotic defense style more so than healthy controls or those with depressive disorders (Spinhoven and Kooiman, 1997), and panic disorder is associated with increased use of idealization and reaction formation (Pollock and Andrews, 1989; Spinhoven and Kooiman, 1997). Neurotic defenses are also associated with the presence of a PD (Johnson et al., 1992). However, among those with a PD, reaction formation (turning distressing feelings [e.g. anger] or impulses [e.g. to aggress] into the directly opposing tendency [e.g. kindness; excessive care] to mask the original tendency) was *negatively* associated with impulsive aggression (Koenigsberg et al., 2001). This suggests that, although those with IED may tend to use neurotic defense mechanisms overall more than individuals without a history of psychopathology, reaction formation may occur less frequently in IED, at least relative to other psychiatric groups.

Mature defenses help reduce aggressive responding (e.g., suppressing an impulse to aggress; Whitman and Gottdiener, 2015). However, the mature defense style is under used among many clinical populations (Bond, 2004; Calati et al., 2010; Spinhoven and Kooiman, 1997). Individuals with an anxiety disorder tend to under use humor (Pollock and Andrews, 1989; Yuan et al., 2002), while those with major depressive disorder under use anticipation (Porcerelli et al., 2009). Further, the presence of a PD is associated with decreased use of mature defenses (Bond, 2004), with those (for example) with BPD specifically underusing suppression, sublimation, and humor relative to those with other PDs (Bond et al., 1994). Impulsive aggression is also negatively associated with suppression (i.e. direct inhibition of aggression when an individual is conflicted with over awareness of feelings of anger or frustration; Koenigsberg et al., 2001) among those with PDs, suggesting that under utilizing suppression may occur in IED.

In sum, the literature to date shows that certain symptoms of PD, including emotional lability and impulsive aggression, may be associated with greater use of immature and neurotic defense mechanisms, and less use of more mature defense mechanisms. Because these symptoms of impulsive aggression and emotional lability are characteristic of IED (McCloskey et al., 2006; Coccaro, 2003) as well, and are often more pronounced (McCloskey et al., 2008a, 2008b), individuals with IED may also present with more immature and neurotic defense mechanisms and less mature defense mechanisms. However, no research to date has specifically examined defensive functioning in IED.

The present study will examine defensive functioning among three groups; individuals with IED, non-IED individuals with PD diagnoses, and healthy volunteers. It is hypothesized that subjects with IED will score significantly lower on mature defenses and significantly higher on immature defenses than healthy volunteers or individuals with a PD. It is also hypothesized that subjects with IED will score significantly higher on neurotic defenses (with the exception of reaction formation) than healthy volunteers, due to neuroticism being associated with overall psychopathology (Jones et al., 2011). Furthermore, consistent with the work of Koenigsberg (2001) we hypothesize that greater endorsement of acting out and less endorsement of suppression and reaction formation will each uniquely predict IED status.

2. Method

2.1. Subjects

Participants were 516 individuals (327 men and 189 women) between the ages of 18 and 65 ($M=33.51$, $SD=9.51$) recruited through advertisements for healthy volunteers and individuals with anger problems as part of larger ongoing aggression studies at a large Midwestern university. Participants were excluded if they had a lifetime diagnosis of psychosis, bipolar disorder, organic brain syndrome, mental disability, or a current diagnosis of substance dependence or major depressive disorder. The study was approved by the University's Institutional Review Board. All participants provided written informed consent prior to enrollment in the study.

Participants were predominately Caucasian (315) or African-American (153), and 180 (76%) had some college education. The 516 participants were categorized into three diagnostic groups. The IED group [IED, $n=217$; 42.1%] was comprised of individuals meeting integrated research criteria for IED (Coccaro, 2003). No individuals in the other diagnostic groups met criteria for IED. The personality disorder group [PD, $n=158$; 30.6%], which was used as a psychiatric control group, consisted of individuals who met DSM-IV criteria for a PD. Finally, healthy volunteers [HV, $n=141$; 27.3%] denied any lifetime psychopathology. Group assignment was based on the results of a diagnostic interview.

Among the IED and PD subjects, 157 (41.9%) had current psychiatric comorbidity, and 332 (88.5%) had lifetime psychiatric comorbidity. Of the 217 subjects in the IED group, 150 (69.1%) had a lifetime history of a mood disorder, 87 (40.1%) had a lifetime anxiety disorder, 101 (46.5%) had a lifetime history of substance or alcohol dependence, and 212 (97.7%) were diagnosed with a PD. Of the 158 subjects in the PD comparison group, 69 (43.7%) had a lifetime history of a mood disorder, 33 (20.9%) had a lifetime

history of an anxiety disorder, and 28 (17.7%) had a lifetime history of substance or alcohol dependence.

2.2. Measures

2.2.1. Structured clinical interview for the DSM-IV (SCID; First et al., 1996).

The SCID was used to diagnose DSM-IV non-IED disorders. The SCID is a semi-structured clinical interview used to assign diagnoses for mood disorders, schizophrenia and other psychotic disorders, alcohol and other substance abuse and dependence, anxiety disorders, somatoform disorders, eating disorders, and adjustment disorders. The SCID has adequate inter- rater reliability with kappa values for modules reported to be between 0.70 and 1.00 (First et al., 1996).

2.2.2. Structured interview for DSM-IV personality (SIDP-IV; Pfohl et al., 1997).

The SIDP-IV was employed to assess personality psychopathology, operationally defined as Axis-II DSM IV PD. Estimates of inter-rater reliability for the SIDP are reported to be adequate (Pfohl et al., 1997).

2.2.3. Intermittent Explosive Disorder Interview (IED-I; Coccaro, 2005).

The IED-I is a semi-structured clinical interview used to diagnose integrated research criteria for IED. The IED-I enables the interviewer to obtain quantitative (e.g., frequency) and qualitative (e.g., description of most severe events) information for verbal aggression, aggression against property, and aggression against others, as well as aggression-related distress and psychosocial impairment. Preliminary data suggests the IED-I is a valid and reliable (κ=0.84) instrument (McCloskey and Coccaro, 2003).

2.2.4. Defensive Style Questionnaire (DSQ; Andrews et al., 1993).

The DSQ is a 40-item (2 items for each of 20 defense mechanisms) self-report measure of the three defense style (Mature, Neurotic, and Immature). The mature and immature defense styles are consistent with Bond's adaptive and maladaptive styles, while the neurotic defense style encompasses both self-sacrificing and imagine-distorting defense styles (Bond et al., 1983; Bond and Vaillant, 1986). The defense mechanisms assessed consist of: sublimation, humor, anticipation, and suppression (the Mature style); undoing, pseudo-altruism, idealization, and reaction formation (Neurotic style); and projection, passive aggression, acting out, isolation, devaluation, autistic fantasy, denial, displacement, dissociation, splitting, rationalization, and somatization (Immature style). For a complete description of the DSQ defense mechanisms discussed in this study, please see Vaillant (1992). All 40 items are statements that participants endorse using a 9-point scale ranging from 1 (*strongly disagree*) to 9 (*strongly agree*). Item scores are summed to create subscale scores. The DSQ has demonstrated good psychometric properties and reliably and consistently differentiates psychiatric groups from normal controls (Andrews et al., 1993).

2.3. Procedure

Participants completed 3 – 4 h diagnostic interviews conducted by trained graduate-level diagnosticians who were blind to the study hypotheses. Diagnoses 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). After completing the diagnostic interview, participants were asked to complete a number of self-report questionnaires, including the DSQ.

Table 1
Demographic variables as a function of diagnostic group.

Variable	Diagnostic group		
	IED (n=217)	PD(n=158)	HV(n=141)
Age *M* (*SD*) [a,b,c]	37.28 (10.03)	32.13 (8.28)	29.26 (7.64)
Gender (%)			
Male	131 (60.4)	106 (67.1)	90 (63.8)
Female	86 (39.6)	52 (32.9)	51 (36.2)
Race (%) [a,c]			
Caucasian	144 (66.4)	81 (51.3)	90 (63.8)
AA/other	73 (33.6)	77 (48.7)	51 (36.2)
Education (%) [b,c]			
Some college	154 (71.0)	114 (73.1)	122 (86.5)
No college	63 (29.0)	42 (26.9)	19 (13.5)

Note: for all significant differences between groups, $p < 0.05$.
[a] IED≠PD.
[b] IED≠HV.
[c] PD≠HV; AA=African American.

2.4. Data analysis

A multivariate analysis of group, covarying for age, race, and education due to group differences on these variables (see Table 1), was performed on each of the three DSQ scales (Mature, Immature, and Neurotic). Where multivariate effects were revealed, we performed univariate analyses on individual subscales, followed by Tukey HSD (for significant main effects). In order to control for the large number of subscales, our alpha value was set at p=0.01 for all of these tests. Finally, to identify defense mechanisms that uniquely discriminated between IED and PD or HV groups, we conducted a pair of logistic regressions with either IED vs. PD (regression 1) or IED vs. HV (regression 2) as the criterion, and all defensive mechanisms that significantly differentiated IED from either PD (regression 1) or HV (regression 2) as the predictor variables.

3. Results

3.1. Preliminary analyses (see Table 1)

Chi-square analyses compared IED, PD, and HV groups on race and education (*See* Table 1). The groups differed significantly with regard to race, χ^2 (2, N=516)=9.39, p=0.009. Compared to the PD group, both IED, [χ^2 (1, n=375)=8.68, p=0.003] and HV, [χ^2 (1, n=299)=4.80, p=0.028], groups had a higher proportion of Caucasians. IED and HV groups did not significantly differ with regard to race. The groups differed significantly with regard to education, χ^2 (2, N=516)=12.26, $p < 0.05$). Compared to individuals with IED, HVs had a significantly greater proportion of individuals with some college education, χ2 (1, n=358)=11.71, $p < 0.05$. IED and PD groups did not significantly differ with regard to education. A one-way ANOVA revealed a significant age difference between diagnostic groups, F(2, 515)=37.46, $p < 0.001$. Post-hoc (Tukey HSD α=0.05) tests showed that IED participants were significantly older than participants in the PD group who, in turn, were significantly older than HV participants. Because age, education, and racial composition differed across the diagnostic groups, these variables were included as covariates in the primary analyses.

3.2. Primary analyses

For the Mature subscales there was a significant multivariate

Table 2
Defensive styles / mechanisms as a function of diagnostic group.

	IED	PD	HV	F	η_p^2
Mature Subscales					
Sublimation[a,b]	9.46 (3.87)	11.018 (3.66)	11.26 (3.73)	11.83***	0.04
Humor [b]	11.66 (3.94)	12.67 (3.80)	13.35 (3.24)	8.17***	0.03
Anticipation	11.07 (3.84)	11.84 (3.75)	11.44 (3.72)	1.79	0.00
Suppression [a,b]	9.56 (3.85)	11.34 (3.92)	12.11 (3.22)	19.42***	0.07
Immature Subscales					
Projection [a,b,c]	8.17 (4.44)	6.67 (4.28)	3.68 (2.61)	40.57***	0.14
Passive Aggression [a,b,c]	8.76 (4.15)	6.75 (3.93)	4.98 (3.04)	30.46***	0.11
Acting out [a,b,c]	12.56 (3.93)	8.98 (4.29)	6.03 (3.56)	94.67***	0.27
Isolation	8.50 (4.13)	7.98 (4.39)	7.07 (3.87)	3.60	0.01
Devaluation [b,c]	7.83 (3.79)	6.71 (3.62)	5.34 (2.89)	14.36***	0.05
Autistic fantasy [b,c]	9.55 (3.94)	8.58 (4.12)	6.82 (3.58)	17.44***	0.07
Denial[b,c]	6.60 (3.80)	6.13 (3.84)	4.97 (3.19)	7.45***	0.03
Displacement[b,c]	8.40 (4.05)	7.98 (3.92)	5.54 (3.21)	21.63***	0.08
Dissociation	6.34 (3.69)	6.34 (4.23)	5.25 (3.67)	3.29	0.01
Splitting [a,b,c]	9.09 (4.35)	7.34 (4.10)	5.38 (3.75)	20.01***	0.07
Rationalization	11.10 (3.69)	10.99 (3.70)	10.25 (3.86)	3.04	0.01
Somatization[b,c]	7.72 (4.32)	7.15 (4.15)	4.55 (3.06)	22.65***	0.08
Neurotic Subscales					
Undoing [b,c]	8.55 (3.96)	7.66 (4.01)	6.02 (3.38)	16.25***	0.06
Pseudo-Altruism	10.72 (3.96)	11.30 (3.65)	10.87 (3.71)	1.03	0.00
Idealization[b,c]	8.21 (4.48)	8.19 (4.64)	6.06 (4.08)	11.00***	0.04
Reaction formation	7.92 (3.92)	8.85 (4.01)	8.72 (4.00)	2.71	0.01

Covarying for race, education and age.

*** $p < 0.001$. Note. All group means are adjusted. For all significant differences between groups, $p < 0.01$.

[a] IED≠PD.

[b] IED≠HV.

[c] PD≠HV.

effect of group [Wilks' λ (8, 1014)=6.60, $p < 0.001$], As shown in Table 2, univariate analyses revealed significant main effects of Group for sublimation, humor, and suppression, with the IED group evidencing less of sublimation and suppression than either the PD or HV groups. The IED group also evidenced less humor than the HV group. Further, the PD group evidenced less sublimation and suppression than the HV group.

For the Immature subscales there was also a significant multivariate effect of group [Wilks' λ (24, 992)=9.41, $p < 0.001$]. As shown in Table 2, univariate analyses revealed significant main effects of group for projection, passive aggression, acting out, devaluation, autistic fantasy, denial, displacement, splitting, and somatization. For projection, passive-aggression, acting out, and splitting the same monotonic pattern emerged with IED participants endorsing more of each mechanism than PD participants, who endorsed more of the defensive mechanism than HV participants. For devaluation, autistic fantasy, displacement, and somatization, IED and PD groups did not differ, with both groups endorsing more of the defensive mechanism than HV participants. Finally, IED (but not PD) participants endorsed more denial than HV participants.

For the Neurotic subscales there was a significant multivariate effect of group [Wilks' λ (8, 1014)=7.78, $p < 0.001$]. Univariate analyses of the main effect of group were significant for undoing and idealization (see Table 2). IED participants and PD participants endorsed more undoing and idealization than HV participants. IED and PD participants did not differ with respect to undoing and idealization.

Considering the large number of defense mechanisms that differentiated IED from PD and HV groups, we attempted to assess which of these defense mechanisms uniquely predicted IED status via hierarchical logistic regressions. For each regression the demographic variables of age, gender, race, and education were entered in the first step. Then all defense mechanisms that significantly differentiated individuals with IED from PD (regression 1) and HV (regression 2) comparison groups were entered in the second step.

Table 3a
Logistic Regression of IED vs PD status on Defense Mechanisms after Controlling for Demographic Variables.

Defense Style	B	SE (B)	Wald	OR	95% CI
Projection	0.02	0.03	0.36	1.02	0.96–1.09
Passive Aggression	0.01	0.04	0.12	1.01	0.94–1.09
Acting Out	0.19	0.03	31.10***	1.21	1.13–1.29
Splitting	0.01	0.04	0.16	1.02	0.95–1.09
Sublimation	−0.12	0.04	10.42**	0.89	0.83–0.96
Suppression	−0.04	0.04	0.96	0.96	0.90–1.03

** $p < 0.01$.
*** $p < 0.001$.

For the regression predicting to IED vs. PD, the omnibus tests of the demographic variables entered in the first step were significant [χ^2 (4)=36.29, $p < 0.001$], as was the omnibus tests for the defense mechanisms entered in step two [χ^2 (6)=73.97, $p < 0.001$]. Among the defense mechanisms, higher levels of acting out and lower levels of sublimation each independently predicted IED status (see Table 3a).

For the regression predicting to IED vs. HV, the omnibus tests of the demographic variables entered in the first step was significant [χ^2 (4)=85.56, $p < 0.001$], as was the omnibus tests for the defense mechanisms entered in step two [χ^2 (14)=192.55, $p < 0.001$]. Specifically, lower levels of sublimation and higher levels of acting out and projection significantly predicted IED status (see Table 3b).

4. Discussion

The present study is the first to examine differences in defense mechanisms in IED. It was hypothesized that individuals with IED would have lower scores on the mature defense style and higher scores on the immature defense style than PD and HV comparison groups as well as higher scores on the neurotic defense style than the HV group. It was also hypothesized that increased acting out and decreased suppression and reaction information would uniquely predict IED status. The findings largely supported these hypotheses.

Table 3b
Logistic Regression of IED vs HV Status on Defense Mechanisms after Controlling for Demographic Variables.

Defense Style	*B*	*SE* (B)	Wald	OR	95% CI
Projection	0.14	0.06	4.75*	1.15	1.01–1.29
Passive Aggression	0.08	0.07	1.32	1.08	0.95–1.28
Acting Out	0.36	0.06	36.61***	1.43	1.27–1.60
Devaluation	−0.02	0.06	0.11	0.98	0.87–1.11
Autistic Fantasy	0.02	0.05	1.50	1.02	0.92–1.14
Denial	−0.03	0.06	0.017	0.97	0.86–1.10
Displacement	0.04	0.06	0.34	1.04	0.92–1.16
Splitting	−0.04	0.05	0.54	0.96	0.87–1.07
Somatization	0.01	0.06	0.02	1.01	0.89–1.14
Sublimation	−0.22	0.06	12.92***	0.81	0.72– 0.91
Humor	−0.11	0.06	3.49	0.90	0.80–1.01
Suppression	−0.02	0.06	0.09	0.98	0.88–1.10
Undoing	0.06	0.06	0.97	1.06	0.95–1.18
Idealization	0.05	0.05	1.07	1.05	0.96–1.16

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

As hypothesized, participants with IED appeared to utilize mature defense mechanisms less. Individuals with IED scored significantly lower than both PD and HV controls on two of four mature defense mechanisms: sublimation, and suppression. Consistent with increased impulsivity seen in IED (McCloskey et al., 2008a, 2008b), this finding suggests that individuals with IED give into unacceptable impulses rather than suppressing them or converting them into more socially acceptable behaviors.

Participants with IED also appear to utilize immature defense mechanisms more often. Participants with IED endorsed significantly higher scores than both PD and HV comparison groups on four of the twelve immature defense mechanisms; projection, passive aggression, acting out, and splitting. IED (and PD) participants also scored significantly higher than the HV group on four other immature defense mechanisms: devaluation, autistic fantasy, displacement, and somatization. The use of immature defense mechanisms is consistent with a general pattern of maladaptive behaviors among individuals with psychopathology, particularly personality disorders (Bond, 2004). Given that individuals with IED consistently display an aggressive response that is disproportionate to provocation, one might argue that engaging in an externalizing defense mechanism like acting out is consistent with the cardinal trait of the disorder. Additionally, this aggressive response is often categorized as a more primitive form of social behavior (Yakeley and Meloy, 2012), suggesting that individuals with IED may engage in more immature and maladaptive methods of conflict resolution or emotion regulation. This hypothesis is consistent with our finding that individuals with IED engage in more immature defense mechanisms than individuals with PD, including projection, passive aggression, acting out, and splitting.

For neurotic defense mechanisms the results are less consistent. IED participants did not significantly differ from PD participants on the neurotic subscales. However, it was found that IED and PD participants scored significantly higher than HV participants did on two of the four subscales, undoing and Idealization. Undoing describes an individual's attempt to negate any hurtful or unacceptable behavior they have already engaged in. These findings may be explained by the increased need to undo, or make amends, among individuals who routinely react in a maladaptive strategy (aggression), as opposed to those who do not engage in aggressive impulses as commonly as those with IED. This hypothesis is bolstered by research suggesting that individuals with IED often experience guilt and remorse following their aggressive outbursts (Kulper et al., 2015).

Higher scores on acting out and lower scores on sublimation each uniquely predicted IED status from PD and HV groups. Additionally, higher scores on projection uniquely predicted IED vs. HV participants, but not IED vs. PD participants. Acting out (aggressing) is the defining characteristic of IED, and thus it should be no surprise that this defense mechanism is uniquely predictive. The finding that individuals with IED report decreased use of mature defense mechanisms such as sublimation (transforming feelings [e.g. desire to aggress], which the individual may find troublesome into some creative product [e.g., art, writing, acting, etc.] which expresses them symbolically for the individual.), suggests a pattern wherein negative emotions are expressed consistently through immature defenses such as aggression and are rarely dealt with in a socially appropriate method. Further, projection reflects the disavowal of an internal state (e.g. anger), and the misattribution of that state to an external agent (e.g. situational factors, other individuals; Vaillant, 1976). While this does not differentiate those with IED from PD, it did uniquely predict IED from healthy individuals. As individuals with IED are more likely to exhibit a hostile attribution bias during ambiguous situations (Coccaro et al., 2009), projection provides a cognitive strategy to deal with the distress caused by their aggressive act, where they then blame the perceived hostile individual or situational factors for their outbursts to reduce psychological distress (i.e. projection). Further, while previous studies have shown that individuals with personality disorders have less mature defensive functioning (Wijk-Herbrink et al., 2011), the deficits specific to those with IED, most notably increased levels of anger, more anger dyscontrol, and deficits in general emotion regulation (Kulper et al., 2015, McCloskey et al., 2006) seem to uniquely preclude the extra cognitive processing time necessary to respond with a mature defense mechanism.

Most forms of therapy provide an opportunity for individuals to recount distressing experiences including the intense affect, and then explore the meaning of both the stressor and (often more importantly) their emotional, cognitive, and/or behavioral response. The study results suggest that treatments aimed at slowing down the response to provocation and increase self-monitoring/self-observation may be effective, as this would aid in increasing awareness of contextual and intrapsychic processes occurring and relatedly would provide more time to utilize more adaptive and mature defenses/strategies as opposed to the quicker and more cognitively simpler immature defenses. Once the automatic link between provocation and the immature defenses is weakened, focus should be on developing more effective strategies to supplant the immature defense mechanisms. This is supported by research showing a multicomponent cognitive behavioral intervention that includes increasing awareness of intern/external anger cues and developing more effective response strategies reduces anger and aggression in IED (McCloskey et al., 2008a, 2008b), as well as more general research showing psychotherapy can reduce the use of immature defenses and increase the use of mature defenses (Kramer et al., 2010; Perry and Bond, 2012). Furthermore, the creation of a strong therapeutic alliance where the patient feels understood and supported is likely of central importance in reducing the use of immature defenses in this aggressive, affectively dysregulated and often personality disordered clinical population (Vaillant, 1992).

This study is the first to characterize defense mechanism patterns in IED. The findings of the current study support the hypothesis that in general, individuals with IED are more likely to use less mature and more immature defense mechanisms than those without IED. This remains true even when the unique deficits associated with comorbid personality disorders are controlled for. As a general pattern, individuals with IED tend to use the immature defense mechanism of acting out, and are less likely to use mature defenses such as sublimation. This is consistent with research on IED showing the defining tendency to use aggression when confronted with negative emotionality in conjunction with deficits in anger control and emotion regulation, which may impair the individual's ability to respond with a more mature defense mechanism.

Limitations of the study include the use of a single self-report measure, which is a common limitation within the defense style literature. This is particularly relevant considering; (1) individuals with a PD (often comorbid in IED), tend to over respond on self-report pathological measures (Tourangeau et al., 2000) and (2) self-reports, which are by definition conscious, are being used here to measure what are thought to be at least partly unconscious processes (Bond, 2004). The use of a PD group as a psychiatric control condition helps address the possible over responding confound (at least as it relates to IED vs. PD comparisons), but future replication using observer methods would clearly be beneficial.

Overall, the findings suggest a unique pattern of defensive functioning in individuals with IED. This information is highly beneficial in developing treatment for difficulties with anger and aggression, including the treatment of IED. By establishing

patterns of maladaptive defense styles, clinicians can develop interventions targeted at increasing the use of mature defense mechanisms and decreasing the use of immature defensive mechanisms, particularly acting out.

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