UNDERSTANDING THE PERSONALITY DISORDER AND AGGRESSION RELATIONSHIP: AN INVESTIGATION USING CONTEMPORARY AGGRESSION THEORY

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Research has consistently demonstrated a link between certain personality disorders (PDs) and increased rates of aggression and violence. At present, understanding of the mechanisms that underlie this relationship is limited. This study was designed to examine the contention (Gilbert & Daffern, 2011) that the application of a contemporary psychological aggression theory, the General Aggression Model (GAM; Anderson & Bushman, 2002), may assist in elucidating the PD–aggression relationship. Eighty-seven offenders undergoing presentence evaluation were assessed for Axis II PDs and psychopathy, aggression, and three constructs delineated by the GAM: scripts, normative beliefs, and anger. Regression analyses were undertaken to examine the relative contributions of these variables to aggression. The results upheld a relationship between several PDs and aggression, and suggested that for these PDs, the consideration of scripts, beliefs supportive of aggression, and anger facilitated an improved understanding of aggressiveness. Overall, the findings indicate that the GAM offers valuable insight into the psychological features that characterize individuals with PD who are prone to aggression.

The aggressive behavior of individuals with personality disorder (PD) represents a serious concern for mental health professionals and for those working in the criminal justice system. A substantial body of research indicates that PDs constitute a risk factor for aggressive and violent behavior in forensic (e.g., Logan & Johnstone, 2010), clinical (e.g., Hodgins, Mednick, Brennan, Schulsinger, & Engberg, 1996), and community (e.g., Yang & Coid, 2007) samples. There is also evidence to suggest, however, that specific PD–aggression relationships vary in both magnitude and direction, supporting the notion that PDs reflect substantial heterogeneity with respect to aggressive behavior (Berman, Fallon, & Coccaro, 1998; Johnson et al., 2000). To date, a

range of issues have hampered the precise characterization of these relation-ships, including conjecture about the nature of PD classification, high rates of PD comorbidity, and methodological issues in the measurement of both PD and aggression. Nevertheless, a number of PDs are consistently found to be associated with aggressiveness, including antisocial (ASPD), borderline (BPD), narcissistic (NPD), and paranoid (PPD), as well as psychopathy (Gilbert & Daffern, 2011).

Despite some progress in theoretical knowledge regarding the mechanisms underlying aggressive behavior for specific PDs (e.g., Logan, 2009), it has been proposed that application of an overarching psychological aggression theory, the General Aggression Model (GAM; Anderson & Bushman, 2002; Anderson & Carnagey, 2004; Anderson & Huesmann, 2007), may elucidate the PD–aggression relationship (Gilbert & Daffern, 2011). The GAM provides a unifying framework under which an array of factors linked to aggression potential may be investigated. Furthermore, it designates several cognitive and affective factors as key determinants of aggressiveness; investigation of these factors may assist in accounting for the increased rates of aggression seen in those with PD.

The GAM adopts a "knowledge structures" approach to aggression, in which the importance of internal representations of past experiences is highlighted. Knowledge structures are used to guide interpretations and be-havioral responses to the social and physical environments, and comprise long-term goals, attitudes, behavioral scripts, and beliefs about appropriate behavior (Anderson & Carnagey, 2004). Although the GAM considers the factors determining aggressiveness to be multiply determined, it proposes that individuals prone to aggression hold more developed aggression-related knowledge structures, with these structures consequently being more likely to be drawn upon for social problem-solving (Anderson & Bushman, 2002). Various situation factors (e.g., frustration, aggressive cues) and person characteristics (e.g., goals) are responsible for the activation of aggression-related knowledge structures and their ongoing accessibility in memory. Frequent activation can result in automatic retrieval of aggressive cognitions, which in turn may lead to habitual aggressive behavior. Emerging research is consistent with this view, supporting the notion that characteristically aggressive individuals demonstrate more extensive cognitive networks linked to aggression (Collie, Vess, & Murdoch, 2007; Gilbert & Daffern, 2010).

The two main types of aggression-related knowledge structure specified by the GAM are aggressive behavioral scripts and normative beliefs support-ive of aggression. Behavioral scripts are stored in memory and used as guides for behavior (Anderson & Bushman, 2002). It is proposed that more aggres-sive individuals hold a larger number of scripts for aggression and thus more regularly retrieve and rehearse content of this nature (Huesmann, 1998). Whereas these scripts provide the procedural knowledge for enacting aggres-sion, normative beliefs about aggression comprise the individual's own un-derstanding about the acceptability of this behavior (Anderson & Bushman, 2002). Normative beliefs are used to evaluate social events and to guide the search for scripts, with those beliefs that are supportive of aggression more likely to positively appraise aggressive acts and the use of aggressive scripts.

To date, no study has concurrently examined the relevance of aggression-related knowledge structures specifically to PD. Research does, however, indicate that normative beliefs supporting the use of violence are prevalent in offenders (e.g., Ireland & Archer, 2002), a population in which there is an overrepresentation of PD (Fazel & Danesh, 2002). In relation to aggressive scripts, this area of research is underdeveloped, and the extent to which scripts contribute to the aggression associated with PD is unknown. A more substantial body of research has examined the relationship between anger and PD. The GAM contends that anger cues aggression-supportive beliefs, primes the retrieval of aggressive scripts, and reduces the quality of information processing (Anderson & Carnagey, 2004). Although anger represents a defining criterion of two PDs in the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-IV-TR*; American Psychiatric Association, 2000), that is, BPD and PPD, studies indicate more widespread elevations on anger across PDs in both clinical (Morse et al., 2009) and nonclinical samples (Howard, Huband, Duggan, & Mannion, 2008). Anger has also been directly linked to the aggression of people with PD (Daffern & Howells, 2009).

THE PRESENT STUDY

The current study investigated the importance of three key theoretical determinants of aggression propensity—normative beliefs supportive of aggression, aggressive scripts, and anger—to the association between aggression and PD in a sample of offenders. Taking into account the lack of previous research in this area, all ten *DSM-IV-TR* PDs were examined to discern how knowledge structures co-occurred with aggression across the different disorders. Further elaboration of the PD–aggression relationship is critical from a conceptual perspective, and importantly, for the development of effective assessment and treatment for offenders with PD. Against this background, the aims of the study were to (a) examine whether offenders with PDs that have established relationships with aggression demonstrated more extensive histories of acting aggressively, (b) explore the relevance of aggressive scripts, normative beliefs supportive of aggression, and trait anger to aggression with respect to each of the PDs, and (c) examine whether these variables assist in accounting for offenders' history of aggression beyond the PD symptoms themselves. In light of the high co-occurrence of depression with PD (e.g., Mantere et al., 2006), as well as aggression (Feldbau-Kohn, Heyman, & O'Leary, 1998) and anger (Koh, Kim, & Joong, 2002), the effect of depression on these variables was also examined.

In line with a previous review (Gilbert & Daffern, 2011), it was hypothesized that participants with greater severity of ASPD, BPD, PPD, and NPD symptoms and traits of psychopathy would report a more extensive history of aggression. Consistent with the GAM's propositions regarding the importance of aggression-related knowledge structures and anger to established patterns of aggression, it was also expected that offenders with greater severity of ASPD, BPD, PPD, and NPD symptomatology would report more frequent script rehearsal, more positive attitudes toward aggression, and

higher levels of trait anger. Finally, it was also hypothesized that for those PDs related to aggression, greater variance in aggressiveness would be better explained by the presence of normative beliefs supportive of aggression, frequent script rehearsal, and higher trait anger than by PD symptom severities alone.

METHOD

PARTICIPANTS

The sample comprised 87 participants referred to a community forensic mental health service in Melbourne, Australia, for presentence psychological or psychiatric evaluation between June 2009 and December 2010. Participants ranged in age from 19 to 64 years (*M* = 33.4, *SD* = 10.7); 78 of the participants were male (90%), and nine were female (10%). Over half of the sample had either pleaded guilty or had been found guilty of a violent offense (*n* = 47, 54%), most commonly assault or recklessly or intentionally causing injury, with the remainder having been convicted of nonviolent offenses (*n* = 40, 46%) such as theft or drug offenses. Individuals who were non-English speaking or who had an intellectual disability were excluded from participation; four individuals were also unable to participate in the study because of pervasive psychotic symptomatology. The ethnic origin of the sample was 71% White Australian, 17% "Other Ethnicity," 8% Asian, and 3% Aboriginal/Torres Strait Islander.

MEASURES

Assessment of Personality Disorders. Axis II PD diagnoses and dimensional ratings were made using the Structured Clinical Interview for Axis II disorders (SCID-II; First, Gibbon, Spitzer, Williams, & Benjamin, 1997). Recent research suggests that the use of dimensional ratings improves the interrater reliability of the SCID-II (Lobbestael, Leurgans, & Arntz, 2011). To calculate dimensional scores, representing PD symptom severity, the method described by Specht, Chapman, and Cellucci (2009) was utilized: (a) scores for each PD criteria were recoded so that 1 (*absent*) = 0, 2 (*subthreshold*) = 0.5, and 3 (*threshold*) = 1; (b) these scores were then summed across all items for each of the PDs; and (c) the totals were then divided by the number of diagnostic criteria for each PD (e.g., 9 for BPD, 7 for PPD). This enabled symptom-level comparisons across the PDs (i.e., where 0 = complete absence of symptoms, and 1 = fulfillment of all criteria). The presence of psychopathic traits was assessed using the Psychopathy Checklist-Screening Version (PCL: SV; Hart, Cox, & Hare, 1995). Interviewers rated the PCL: SV using the information obtained at interview and available collateral information, including official criminal records.

Clinical Diagnoses of Depression. To examine the confounding influence of depression on aggression and other study variables, depression was diagnosed using the relevant modules of the Structured Clinical Interview for

DSM-IV Axis I Disorders-Patient Edition (SCID-I/P; First, Spitzer, Gibbon, & Williams, 2007). Participants were classified as having a history of depression if they met criteria for major depressive, dysthymic, bipolar, or schizoaffective disorders, or depressive disorder not otherwise specified.

Aggression-Related Constructs. The Life History of Aggression, Aggression Scale (LHA-A; Coccaro, Berman, & Kavoussi, 1997) was used to quantify the frequency and severity of aggressive acts occurring since adolescence. The LHA-A is a semistructured clinical interview comprising five items, each targeting a different form of aggression (verbal, indirect, nonspecific fighting, physical assaults, and temper tantrums). Items are rated on a six-point scale from 0 (*zero events*) to 5 (*more events than can be counted*) and summed to produce an overall score (range = 0–25). Excellent psychometric qualities are reported for the LHA-A, including high internal reliability (α = .87), and excellent test–retest (r = .80) and interrater (r = .94) reliability (Coccaro et al., 1997). In the current study, high internal reliability was also obtained (α = .83). The LHA-A is strongly positively correlated with measures of trait aggressiveness, including the Buss Perry Aggression Questionnaire (r = .63; Fanning, Berman, Mohn, & McCloskey, 2011), although by quantifying actual aggressive acts there is some conceptual distinction from these measures. Participants' self-reported aggression was verified using file information.

Aggressive script rehearsal was assessed using the Schedule of Imagined Violence (SIV; Grisso, Davis, Vesselinov, Appelbaum, & Monahan, 2000). The SIV was developed to assist with the prediction of impending violence, and several studies support its predictive validity (e.g., Grisso et al., 2000; Nagtegaal, Rassin, & Muris, 2006); it is presently also the only measure of aggressive scripts available for use with adults. The SIV measures various characteristics of an individual's aggressive scripts, including their frequency, chronicity, and seriousness. For the present study, we were interested in the extent of participants' scripts. The 2-month time specifier for several items was therefore removed, and the frequency item (SIV-F; "How often do you have thoughts about harming or injuring others?") was used to denote previous levels of script rehearsal. Responses were classified on an eight-point scale: 0 (*never*), 1 (*once every few years*), 2 (*several times a year*), 3 (*several times a month*), 4 (*once a week*), 5 (*several times a week*), 6 (*once a day*), and 7 (*several times a day*). These response options were then dichotomized via a median split (*Mdn* = 2), whereby participants were classified as either "infrequently" (i.e., responses 0–1) or "frequently" (i.e., responses 2–7) engaging in aggressive thinking.

Normative beliefs about violence were assessed using the Attitudes to Violence (AV) scale of the Measures of Criminal Attitudes and Associates (MCAA; Mills & Kroner, 2001). This 12-item scale contains statements that the respondent rates as either "agree" or "disagree" (e.g., "It's not wrong to fight to save face"); these are then summed to produce a total score. Higher scores suggest endorsement of violence-supportive attitudes and a willingness to use violence for instrumental purposes. The MCAA was developed using multiple samples of incarcerated offenders, and good internal reliability (α = .80) and test–retest reliability (Intraclass Correlation Coefficient = .73) are

TABLE 1. Means, Standard Deviations, Range, and Cronbach's Alpha's (α) for Total Sample and Participants with Depression

Variable	Total Sample				History of Depression					
					Present		Absent			
	M	SD	Range	α	M	SD	M	SD	t	df
Aggression	11.51	7.81	1.00–25.00	.83	13.38	7.12	8.97	8.20	–2.64*	83
Trait Anger	18.11	6.47	10.00–37.00	.90	18.96	5.98	16.57	6.70	–1.73	83
Attitudes to Violence	3.26	2.94	1.00–12.00	.82	3.44	2.67	3.22	3.37	–0.31	71
Impression Management	7.95	3.79	1.00–18.00	.78	7.27	3.23	8.95	4.31	2.05*	83
Axis II Symptoms										
Paranoid	.25	.22	.00–.79	.67	.30	.21	.17	.21	–2.78*	82
Schizoid	.25	.24	.00–.93	.72	.28	.24	.22	.23	–1.00	81
Schizotypal	.21	.20	.00–.83	.66	.27	.20	.15	.18	–2.79	82
Antisocial	.42	.24	.00–1.00	.70	.46	.19	.36	.28	–2.00*	83
Borderline	.28	.22	.00–.78	.80	.33	.22	.20	.21	–2.75*	83
Narcissistic	.21	.19	.00–.83	.67	.21	.16	.21	.21	–0.03	82
Histrionic	.12	.15	.00–.69	.66	.11	.12	.13	.18	0.58	82
Avoidant	.20	.24	.00–.86	.81	.24	.27	.14	.18	–2.04*	82
Dependent	.11	.14	.00–.69	.49	.11	.14	.10	.14	–0.24	82
Obsessive-Compulsive	.21	.17	.00–.81	.54	.20	.17	.23	.17	0.65	82
Psychopathy	8.97	4.63	1.00–20.00	.67	9.21	4.29	8.67	5.09	–0.51	73

Note: N ranges from 73 to 87. Higher scores represent higher values on all variables.

reported for the AV scale (Mills, Kroner, & Forth, 2002). The MCAA has also been standardized for use in both forensic and nonforensic populations (Mills & Kroner, 2001), an important consideration in the present research because a substantial proportion of the sample had no prior criminal history (*n* = 35, 40%).

Trait Anger. The 10-item Trait Anger (T-Ang) scale of the State-Trait Anger Expression Inventory-2 (STAXI-2; Spielberger, 1999) was used to assess the frequency with which participants experienced angry feelings over time. Good internal reliability is reported for the T-Ang scale for both normal adults (α = .84 to .86) and psychiatric patients (α = .87, Spielberger, 1999). In the present research, the internal reliability was excellent (α = .90).

Socially Desirable Responding. Since a negative relationship between impression management and antisocial attitudes has been identified (Mills & Kroner, 2006), the Impression Management (IM) subscale of the Paulhus Deception Scale (Paulhus, 1999) was used to assess participants' tendency to engage in socially desirable responding.

PROCEDURE

The current study was approved by the Victorian Institute of Forensic Mental Health and the Monash University Standing Committee on Ethics in Research Involving Humans. The assessment procedure consisted of two ses-

sions completed consecutively on the same day. The first session formed part of the presentence evaluation for each participant and contained the assessment relating to clinical diagnoses (SCID-I and SCID-II), the majority of aggression-related constructs (LHA-A, SIV-F, T-Ang), and impression management (IM). Upon completion of the presentence evaluation, participants were invited to provide consent for the relevant information to be used for research purposes. Consenting individuals were then invited to participate in a second, optional session that comprised the AV and PCL-SV. Fourteen participants chose not to complete this "research-only" session. Research assistants who had completed doctoral-level clinical training and were trained in the administration of the instruments conducted all interviews. Issues in rating were resolved through discussions with M.D. and J.O., both experienced clinical and forensic psychologists.

STATISTICAL ANALYSES

Dimensional measurement of PD enabled the use of continuous data, providing scores on PD symptom severity for the entire sample. The bivariate associations between the aggression variables, PD symptoms and psychopathy, and age were first examined using Pearson correlation analyses. Partial correlations were also carried out in order to examine the relationships between attitudes to violence (AV) and PD symptoms while controlling for trait anger (T-Ang). The effects of diagnoses of depression and gender on aggression variables were next investigated using independent t tests and chi-square analyses. Hierarchical linear regression was then used to test the hypotheses regarding the PD–aggression relationships and the importance of trait anger (T-Ang), attitudes to violence (AV), and scripts (SIV-F) with respect to these relationships. Because the association between each PD and the set of aggression-related variables was of theoretical interest, regression analyses were undertaken for those PDs demonstrating a significant bivariate association with aggression. This resulted in five regression models overall. A posthoc power analysis was conducted using the software package G*Power (Erdfelder, Faul, & Buchner, 1996), where the sample size of 87 was selected and the number of predictor variables was set at 5. The measurement guidelines for effect size (*f2*) provided by Cohen (1988) were utilized (i.e., small = .02; medium, = .15, and large = .30), and the alpha level was set at $p < .05$. This analysis revealed that the statistical power for detecting a small effect was .39 and for detecting a medium effect or larger was .97, suggesting that there was sufficient power (i.e., power of .80 or more) to detect a medium to large effect size.

For each regression model, depression and age were initially included as covariates due to associations with both independent and dependent variables. Nonsignificant relationships were obtained, however, and they were excluded from subsequent analyses. The final regression model for each PD, with aggression (LHA-A) as the criterion variable, was: IM was entered as a covariate (Step 1), followed by PD symptoms (Step 2), and trait anger, attitudes to violence, and scripts (Step 3). Entry in this order enabled examina-

tion of the importance of aggression-related variables to aggression above and beyond PD symptoms.

RESULTS

CLINICAL DIAGNOSES OF PD AND DEPRESSION

Thirty-eight participants met criteria for one or more Axis II diagnosis (44%). The prevalence of PD diagnoses was: ASPD (n = 20, 23%), BPD (n = 14, 16%), PPD (n = 10, 12%), schizoid (n = 9, 10%), avoidant (AVPD; n = 5, 6%), NPD (n = 4, 5%) schizotypal (STPD; n = 3, 3%), obsessive-compulsive (n = 2, 2%) and dependent (n = 1, 1%). More than one-fifth of the sample (n = 19, 22%) fulfilled criteria for two or more PD categories; the most common comorbid diagnoses were ASPD-BPD (9%), and ASPD-PPD (6%). Means and standard deviations (SDs) for the PD dimensions are shown in Table 1. Forty-eight participants (55%) had a history of depression; prevalent diagnoses were major depressive disorder (n = 37, 31%) and dysthymic disorder (n = 15, 17%). Independent t tests were used to examine whether PD symptom severity differed for participants with respect to diagnoses of depression (Table 1). These results suggested that participants with a history of depression scored higher on symptoms of PPD, ASPD, BPD, and AVPD.

PREVALENCE OF AGGRESSION, ANGER, AND AGGRESSION-RELATED KNOWLEDGE STRUCTURES

Means, SDs, and ranges for history of aggression (LHA-A), trait anger (T-Ang), and attitudes to violence (AV) are found in Table 1. Most of the sample (n = 53, 61%) reported that they engaged in "frequent" script rehearsal (SIV-F); fewer reported that their rehearsal was "infrequent" (n = 34, 39%). Bivariate correlations examining the relationships between age and aggression-related variables indicated that younger participants demonstrated more extensive aggression (r = –.25, p = .021), higher trait anger (r = –.28, p = .009), more positive attitudes to violence (r = –.34, p = .003), and more frequent script rehearsal (r = –.21, p = .049). Independent t tests used to examine the influence of gender and depression on aggression variables indicated no differences in scores on attitudes to violence or trait anger, although males reported greater past aggression (M = 12.1, SD = 6.1) than females (M = 6.1, SD = 7.9, t(85) = 2.24, p = .028), as did participants with depression (M = 13.4, SD = 7.1) compared to nondepressed participants (M = 9.0, SD = 8.20, t(83) = –2.64, p = .010). Chi-square analyses also revealed differences in script rehearsal with respect to depression: 75% of participants with a history of depression were classified as engaging in "frequent" script rehearsal, compared to 43% of participants with no history (χ^2(1) = 7.59, p = .006).

RELATIONSHIPS AMONG AGGRESSION-RELATED VARIABLES

Correlation coefficients for the associations between aggression variables and impression management are found in Table 2. Histories of aggression,

TABLE 2. Correlations Between Aggression-Related Variables, Impression Management, and Personality Disorder Symptoms

Measure	AGG	AV	SIV-F	T-ANG	IM	PPD	SCPD	STPD	ASPD	BPD	NPD	HPD	AVPD	DPD	OCPD	PCL
AGG	—															
AV	.54**	—														
SIV-F	.45**	.25*	—													
T-ANG	.63**	.57**	.30*	—												
IM	-.46**	-.49**	-.37**	-.49**	—											
PPD	.46**	.42**	.14	.41**	-.19	—										
SCPD	.16	.04	-.03	.15	-.16	.31*	—									
STPD	.33*	.13	.17	.15	-.20	.46**	.45**	—								
ASPD	.71**	.45**	.30*	.48**	-.43**	.37**	.16	.29*	—							
BPD	.54**	.33*	.33*	.56**	-.39**	.57**	.31*	.49**	.61**	—						
NPD	.25*	.24*	-.01	.31*	-.27*	.29*	.03	.22*	.28*	.40**	—					
HPD	.09	-.11	-.04	.09	.07	.03	-.03	.07	.03	.12	.39**	—				
AVPD	.10	.01	.04	.24*	-.06	.34*	.23*	.25*	-.04	.27*	.05	-.02	—			
DPD	-.09	-.04	-.03	.04	.12	.05	-.06	.13	.05	.19	.07	.07	.29*	—		
OCPD	.19	.27*	.00	.28*	.25	.13	.41**	.30*	.06	.23*	.44**	.22*	.08	-.03	—	
PCL	.65**	.41**	.16	.39**	-.31*	.51**	.40**	.41**	.72**	.48**	.41**	.10	.02	.02	.13	—

Note: N ranges from 74 to 84. AGG = Aggression, AV = Attitudes to Violence, SIV-F = Frequency of Imagined Violence (frequent vs. infrequent), T-ANG = Trait Anger, IM = Impression Management, PPD = Paranoid PD symptoms, SCPD = Schizoid PD symptoms, STPD = Schizotypal PD symptoms, ASPD = Antisocial PD symptoms, BPD = Borderline PD symptoms, NPD = Narcissistic PD symptoms, HPD = Histrionic PD symptoms, AVPD = Avoidant PD symptoms, DPD = Dependent PD symptoms, OCPD = Obsessive-Compulsive PD symptoms, PCL = Psychopathy Checklist-Screening Version Total Score.
*p < .05, **p < .001.

TABLE 3. Hierarchical Regression Analyses of Trait Anger, Attitudes to Violence, Script Rehearsal, and Personality Disorder Symptoms on Aggression

| | History of Aggression | | | | | | | | | | | |
| | Paranoid | | Schizotypal | | Narcissistic | | Borderline | | Antisocial | | Psychopathy | |
Variable	β	ΔR^2_{adj}	β	ΔR^2_{adj}	β	ΔR^2_{adj}	β	ΔR^2_{adj}	β	ΔR^2_{adj}	β	ΔR^2_{adj}
Step 1		.18**		.18**		.18**		.18**		.18**		.18**
Impression Management	-.43**		-.43**		-.43**		-.44**		-.44**		-.44**	
Step 2		.20**		.05*		.01		.14**		.31**		.27**
Impression Management	-.33**		-.39**		-.38**		-.29*		-.18		-.25*	
PD Symptoms	.46**		.25*		.15		.41**		.62**		.56**	
Step 3		.16**		.28**		.28**		.17**		.12**		.19**
Impression Management	-.06		-.01		-.01		-.02		.03		.03	
PD Symptoms	.29*		.20*		.10		.21*		.46**		.45**	
Trait Anger	.25*		.35*		.32*		.25*		.28*		.27*	
Attitudes to Violence	.18		.24*		.25*		.25*		.13		.14	
Script Frequency	.29*		.27*		.31*		.25*		.21*		.31**	
Total R^2_{adj}		.53**		.50**		.47**		.49**		.62**		.63**

Note. $N = 73$.
*$p < .05$, **$p < .001$.

attitudes to violence, frequency of script rehearsal, and trait anger were all positively related; the strongest of these relationships was that between anger and aggression ($r = .63$, $p = .001$). Impression management was moderately associated with all variables in the negative direction.

RELATIONSHIPS BETWEEN PD AND AGGRESSION-RELATED VARIABLES

Bivariate correlations between the *DSM-IV* PDs and aggression (Table 2) revealed that ASPD, BPD, PPD, STPD, and NPD were positively related to aggression. The strongest associations were for ASPD and BPD; these two PDs were also distinct in yielding positive correlations with attitudes to violence, frequency of aggressive script rehearsal, and trait anger. Relationships between other PDs and aggression-related variables were more heterogeneous. PPD and NPD symptom severity correlated with attitudes to violence and trait anger, but not script frequency; in contrast, STPD symptom severity did not correlate with any of these variables. Psychopathy scores were strongly related to aggression, and moderately related to attitudes to violence and frequency of script rehearsal; all of these relationships were in the positive direction. Symptom severities for the remainder of the PDs were not significantly related to aggression, although obsessive-compulsive PD (OCPD) and AVPD were positively related to trait anger, and OCPD was also related to script frequency.

To examine the relationships between attitudes to violence and trait anger with respect to the various positive PD–aggression relationships, partial correlation analyses were conducted. The results revealed that BPD ($r = -.01$, $p = .954$), PPD ($r = .21$, $p = .087$), and STPD ($r = .01$, $p = .965$) symptoms were unrelated to attitudes to violence after controlling for trait anger. Although the strength of the relationships between attitudes to violence and ASPD ($r = .27$, $p = .023$) and psychopathy ($r = .26$, $p = .027$) were reduced after controlling for trait anger, these relationships remained significant.

RELATIVE CONTRIBUTIONS OF PD, KNOWLEDGE STRUCTURES, AND ANGER TO AGGRESSION

Regression analyses (Table 3) revealed that PD symptom severity was associated with aggression for PPD, STPD, BPD, ASPD, and psychopathy, but not NPD. The amount of variance explained ranged from 5% for STPD to 31% for ASPD. For all PDs associated with aggression, the entry of trait anger and frequency of script rehearsal revealed unique positive relationships with aggression beyond the effects accounted for by PD symptoms. In contrast, attitudes to violence were uniquely related to aggression only for STPD and BPD. The amount of variance accounted for by the combination of trait anger, beliefs, and scripts was greater than that explained by the respective PD symptom severity for BPD (17%) and STPD (28%), while the variance accounted for by the combination of trait anger and scripts was smaller for ASPD (12%), PPD (16%), and psychopathy (19%) relative to PD symp-

toms. The overall amount of variance accounted for by the models (excluding NPD) ranged from 49% (BPD) to 63% (psychopathy).

DISCUSSION

To our knowledge, this is the first study to concurrently investigate the role of key determinants of individual differences in aggressiveness, as proposed by a contemporary model of aggressive behavior, in the relationship between PD and aggression. The results suggested that two types of aggression-related knowledge structure, scripts and normative beliefs, and trait anger were more pronounced in those PDs positively related to aggression (ASPD, BPD, PPD, STPD, and NPD) and, in particular, highlight the association between aggressive script rehearsal and overt aggression. Scripts accounted for a unique proportion of variance in aggression for all PDs, an important finding since scripts have received little empirical attention. Normative beliefs were moderately related to all PDs associated with aggression and uniquely contributed to aggression for two of these PDs (BPD and STPD).

The PDs found to be related to aggression in this study generally corresponded to those relationships identified in previous research, although the strength of the NPD–aggression relationship in this study was weaker than anticipated and an additional PD, STPD, also demonstrated a positive relationship with aggression. Of the various PDs, those accounting for the largest proportion of variance in aggression were ASPD (31%) and psychopathy (27%). This finding is understandable given the conceptual link between these PDs and aggressiveness; it is also consistent with other studies that, conversely, indicate high rates of these PDs in violent offenders (e.g., Blackburn & Coid, 1999). The relationships between aggression and scripts, beliefs, and anger were not especially strong for either ASPD or psychopathy, suggesting that the consideration of these additional variables did not assist greatly in differentiating aggressive individuals beyond the features of these PDs. This finding might be accounted for by overlapping variance with the GAM constructs (Gilbert & Daffern, 2011). For instance, ASPD includes in its diagnostic criteria "irritability" and "lack of remorse, as indicated by having indifferent to or rationalizing having hurt, mistreated, or stolen from another" (American Psychiatric Association, 2000, p. 706); these criteria likely correspond with high trait anger and beliefs supportive of aggression.

In contrast to the results for ASPD, the unique relationship between BPD symptoms and aggression was relatively weak. Researchers who have failed to find an association between BPD and violence have contended that PD comorbidity may account for this relationship (Berman et al., 1998; Johnson et al., 2000). The present results suggest, however, that the combined effect of trait anger, aggression-supportive beliefs, and frequent script rehearsal accounted for a greater proportion of variance in aggression than BPD severity alone. The importance of trait anger to the BPD–aggression relationship is especially noteworthy given that the BPD criteria also include "affective instability" and "inappropriate, intense anger or difficulty controlling anger" (American Psychiatric Association, 2000, p. 710). This finding suggests

that those people with BPD who also have high trait anger and aggression-supportive beliefs, and who frequently rehearse aggressive scripts, are likely to be at an increased risk for aggression; those people with BPD lacking these additional characteristics may be less prone to aggression. The results also suggest that a common route by which aggression occurs for those with PPD is anger dysregulation. For STPD, PD symptoms were ineffective in accounting for aggression relative to the GAM constructs.

The main limitation of this study was its cross-sectional design, which prevented examination of the stability of the PD–aggression relationships and of the contribution of aggression-related knowledge structures to aggression over time. Although the internal reliability of the SCID-II as it related to the various PDs was generally adequate and there was a reasonable range in PD severity among the sample, future studies would benefit from the use of prospective methods and from larger samples that include greater proportions of individuals with severe PD and histories of severe violence. The limited sample size also prevented investigation of the different knowledge structure profiles of comorbid PDs. A particular constellation worthy of future investigation is that of APD and BPD, which has been shown to have an especially strong relationship with violence (Howard, 2009).

Taking into account the modest sample size, the implications of the present study are that application of the GAM appears to offer valuable insight into the distinct psychological features that characterize individuals with PD who are prone to aggression. The findings are particularly important for the assessment and treatment of violence-prone individuals with PD, and it may be that more systematic assessment of normative beliefs regarding aggression, aggressive scripts, and anger may improve the individual formulation of violence propensity in this population and help to determine which individuals with PDs are more likely to be violent. Future research in this area is likely to have important treatment implications for this population. The present results suggest that interventions for people with PD who are aggressive should ensure a sufficient focus on normative beliefs supportive of aggression, aggressive scripts, and anger, although the degree to which intervention should focus on these variables is likely to vary according to the PD profile of the individual patient. Prospective studies of the PD–aggression relationship should be conducted with reappraisal of normative beliefs, scripts, anger, and aggression in order to determine the influence of these variables over time and whether they are causally related to aggressive acts.

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