The Impact of Antisocial Personality Characteristics on Anger Management Treatment for Veterans With PTSD

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Using multilevel modeling, the authors examined the impact of antisocial personality characteristics on the effectiveness of cognitive–behavioral anger management group treatment among 86 veterans with posttraumatic stress disorder. A wide range of forms of anger, as well as use of physical aggression, decreased during treatment. As predicted, antisocial personality characteristics were associated with smaller decreases in trait anger, anger expression, and use of physical aggression during treatment. Conversely, these characteristics were associated with a greater decrease in state anger. Mechanisms of action and implications for the role of anger and antisocial personality in treatment are proposed.

Keywords: posttraumatic stress disorder, antisocial personality disorder, anger, aggression, cognitive–behavior therapy

Anger is one of the most salient psychological problems for veterans with posttraumatic stress disorder (PTSD). Across studies, the strength of the association between PTSD and anger is large, the association is not an artifact of measurement overlap, and a stronger association exists among samples of combat veterans than other samples (Novaco & Chemtob, 2002; Orth & Wieland, 2006). Biddle, Elliott, Creamer, Forbes, and Devilly (2002) found that Vietnam veterans with PTSD, as well as their spouses and clinicians, rated anger as the social or emotional problem that interfered most with the veterans’ normal activities or caused the veterans the most distress. In addition to being associated with a variety of physical health problems (e.g., Miller, Smith, Turner, Guijarro, & Hallet, 1996), injury (e.g., Vinson & Arelli, 2006), and legal and vocational difficulties (Deffenbacher, Oetting, Lynch, & Morris, 1996), anger is associated with deterioration of social support and family functioning (Evans, McHugh, Hopwood, & Watt, 2003; Lane & Hobfoll, 1992), which may have reciprocal consequences for PTSD symptoms (e.g., L. A. King, King, Fairbank, Keane, & Adams, 1998). Moreover, anger has been found to impede treatment outcome for PTSD (Foa, Riggs, Masie, & Yarczower, 1995; Forbes, Creamer, Hawthorne, Allen, & McHugh, 2003; Taylor et al., 2001; however, see Pitman et al., 1996, and Cahill, Rauch, Hembree, & Foa, 2003, for null findings). Given the difficulties with anger frequently experienced by veterans with PTSD, it is not surprising that PTSD symptomatology is also associated with physically aggressive behavior among this population (Beckham, Feldman, Kirby, Hertzberg, & Moore, 1997; Marshall, Panuzio, & Taft, 2005). In fact, male Vietnam veterans with PTSD have been found to engage in nearly four times more violent acts per year than those without PTSD (Kulka et al., 1988).

The effects of anger on the lives of veterans with PTSD clearly warrant the development of effective anger management interventions for veterans with PTSD. Across civilian samples (e.g., undergraduate students, community adults), cognitive–behavior therapy (CBT) and its subcomponents (e.g., cognitive restructuring, relaxation training, skills training) are the most widely studied form of anger management intervention and have been shown to be an effective means of decreasing anger, typically represented by medium or large effect sizes (see Del Vecchio & O’Leary, 2004, and DiGiuseppe & Tafrate, 2003). Among veterans with PTSD, Chemtob, Novaco, Hamada, and Gross (1997) found that CBT decreased some forms of anger (i.e., anger expression and self-reported anger during anger-provoking scenarios), but did not decrease others (i.e., trait anger and physiological responses to anger-provoking situations). Chemtob, Novaco, Hamada, and Gross (1997) did not measure change in relevant constructs such as participants’ use of physical aggression and pretreatment state anger (i.e., transitory anger experienced early in the treatment process, as opposed to a stable disposition marked by proneness to experience anger or a tendency to express anger intensely and in maladaptive ways). Pretreatment state anger has been found to predict less change in PTSD symptoms during exposure-based treatments (Foa et al., 1995; however, see Cahill et al., 2003, for null findings), suggesting a need for empirical investigations explicitly examining the ability of CBT to decrease state anger during therapy among PTSD populations. In addition, because anger and aggression are reciprocally activated (Bandura, 1973;
Novaco, 1986), anger treatment may be used to effectively de-
crease the high rates of physical aggression among veterans with
PTSD (Bolton et al., 2004).

Although CBT appears to be moderately effective for decreas-
ing some forms of anger and aggression among veterans with
PTSD, we have little understanding of the individual difference
characteristics that affect treatment response for anger and physi-
cal aggression, either in general or specifically among veterans
with PTSD. By identifying individual characteristics that impede
treatment outcomes, more effective interventions can be designed.
Among veteran populations, PTSD is highly comorbid with anti-
social personality disorder (i.e., as high as a 31% comorbidity rate
in Kulka et al., 1998), and it has been suggested that antisocial
personality characteristics negatively affect PTSD treatment out-
come among combat veterans scoring high in anger (Forbes et al.,
2003). Among civilian populations, antisocial personality disorder
characteristics are associated with poor anger modulation (Zlot-
nick, 1999) and aggression (Quinsey, Book, & Lalumi`ere, 2001),
and have been found to negatively affect treatment for issues such
as substance abuse (Galen, Brower, Gillespie, & Zucker, 2000)
and partner violence (Saunders, 1996).

Antisocial personality is a broad construct, traditionally concep-
tualized as including two related domains: (a) antisocial and crim-
inal behaviors (e.g., theft, assault, impulsivity, recklessness) and
(b) psychopathic personality traits (e.g., superficial charm, manip-
ulating, externalization of blame, diminished experience of
emotions such as guilt, empathy, and anxiety; Cleckley, 1976;
Harpur, Hare, & Hakstian, 1989). Together, these characteristics
are likely to negatively affect treatment for anger and aggression.
Indeed, antisocial personality characteristics have been associated
with poor treatment engagement (Dolan & Davies, 2006) and
diminished formation of a working alliance with one’s treatment
provider (Taft, Murphy, Musser, & Remington, 2004), which in
turn lead to poor treatment prognosis (Taft, Murphy, King,
Musser, & DeDeyn, 2003). Thus, antisocial personality character-
istics may account for some variability across individuals in the
effectiveness of anger management therapy for trait anger, anger
expression, and physical aggression perpetration. However, the
impact of antisocial personality characteristics on change in state
anger among veterans with PTSD may be more complicated.

Current theories of the functional nature of anger and PTSD
suggest that anger is activated in response to a lowered threshold
for perceiving threat (Chemtob, Novaco, Hamada, Gross, & Smith,
1997) and is used to avoid feelings of fear (Foa et al., 1995; Riggs,
Dancu, Gershuny, Greenberg, & Foa, 1992). Therefore, anger may
be used to avoid the emotionally laden process and content of
therapy, which historically has been viewed as threatening and
anxiety- or fear-inducing (e.g., Horney, 1939). If this is the case, it
would be expected that antisocial personality characteristics,
prematurely marked by a diminished motivation to engage in therapy,
would be positively associated with pretreatment state anger (rep-
resenting disengagement from therapy), as well as little change in
state anger during therapy (representing a continued disengagement
from therapy). However, some researchers have not found a
detrimental role of state anger during exposure therapy for PTSD
(Cahill et al., 2003; Pitman et al., 1996), suggesting that anger does
not impede fear activation in PTSD and is not used to avoid the
anxiety produced during therapy. This research leads to an alter-
native hypothesis. Specifically, in the context of therapy, state
anger may function in the same manner as other forms of nega-
tively valenced emotions, reflecting engagement in the therapy
process, and leading to therapeutic improvements during group
CBT (e.g., Castonguay, Pincus, Agras, & Hines, 1998; Goldfried,
2003). This framework suggests that antisocial personality char-
acteristics would not be strongly associated with pretreatment state
anger (representing lack of engagement in therapy) and would be
associated with a greater decrease in state anger during therapy
(representing continued lack of engagement in the therapeutic
process).

In the current study, we examined the impact of antisocial
personality characteristics on the effectiveness of anger manage-
group treatment to reduce state anger, trait anger, anger
expression, and use of physical aggression among veterans with
PTSD. We predicted that higher levels of antisocial personality
disorder characteristics would be associated with smaller decreases
in trait anger, anger expression, and use of physical aggression
during treatment. Given existing alternative hypotheses regarding
the impact of antisocial personality characteristics on change in
state anger, no prediction was made for this association.

Method

Participants

Participants included 86 male veterans who completed an as-
essment for PTSD and related psychological disorders through the
Behavioral Science Division of the National Center for PTSD,
VA Boston Healthcare System, or the affiliated VA outpatient
clinic. All participants were diagnosed with PTSD using the Clin-
ician Administered PTSD Scale (Blake et al., 1990), and support-
ing evidence was gathered using self-report measures of PTSD,
including the PTSD Checklist (Blanchard, Jones-Alexander, Buck-
ley, & Forer, 1996), the Mississippi Scale for Combat-Related
PTSD (Keane, Caddell, & Taylor, 1988), and the Minnesota Mul-
tiphasic Personality Inventory II Keane PTSD (PK) Scale (Keane,
Malloy, & Fairbank, 1984). Data were gathered from 1997 to
2006. All participants were informed that participation would not
affect eligibility for VA services and their data would be kept
separate from their medical record.

Eighty-three percent of the sample self-identified as Caucasian,
15% self-identified as African American, and 2% self-identified as
“other.” Participants averaged 55 years in age (SD = 8.22;
range = 25–76). The majority of the sample was either married
(49%) or divorced (27%), and a minority was separated (6%),
remarried (7%), cohabiting (5%), or had never been married (6%).
Although 41% of participants had some college education, only
28% were working full time. Sixty percent of participants were
retired, disabled, or unemployed, and 12% were students or were
working part time. Most participants served during the Vietnam
era (76%), whereas others served during the Korean War (7%),
World War II (7%), Operation Desert Storm (3%), and other
conflicts (7%). VA service-connected disability compensation was
received by 60% of participants.

Procedure

Following completion of a comprehensive assessment, partici-
pants were enrolled in a series of group interventions at the

National Center for PTSD, VA Boston Healthcare System. The group sequence involved completion of a psychoeducational group and a stress management group prior to enrolling in a manualized cognitive–behavioral anger management group treatment (AMGT; Grace, Niles, & Quinn, 1999). Given the individualized nature of treatment planning, there were some instances in which participants attended groups out of sequence, and some participants engaged in individual psychotherapy or psychopharmacological treatment concurrent with AMGT. Anger management treatment groups were offered a maximum of twice per year. Participants began AMGT an average of 23 months ($SD = 23$, range $5–124$) after the assessment, largely because of participants’ completion of two groups prior to AMGT and to the frequency with which AMGT was offered. Some participants left the clinic for a period of time prior to beginning AMGT.

Treatment groups met for 90 min once per week for 12 weeks. Groups were co-led by two therapists, at least one of whom had a doctorate degree in clinical psychology. Prior to initiating the groups, therapists were trained in methods of adhering to the AMGT manual, and therapists who had not previously led a group were supervised by an experienced co-leader. The group format included didactic materials, group discussions, and skills-based exercises. Group sessions began with psychoeducational material regarding anger and focused on recognition of physiological indicators of anger (e.g., muscle tension, increased heart rate, flushing) and anger-related cognitions (e.g., “Someone needs to teach that guy a lesson”). Participants were then taught how to recognize individual anger triggers, as well as the link between emotions, cognitions, and subsequent behavior. They completed in-session and between-sessions cognitive restructuring exercises to minimize inflammatory thoughts (e.g., “I’m mad, but I’m not going to let it get to me”). They also used behavioral techniques to learn how to respond appropriately to anger-inducing situations, with an emphasis on the distinction between aggressive, passive, and assertive behaviors. These techniques included timeouts, relaxation, breathing exercises, and positive distraction. Group members also practiced methods for communicating their feelings in ways that would not be damaging to themselves or others.

Participants completed self-report measures of anger and aggression during the first and last sessions of AMGT.

**Measures**

**State-trait anger expression inventory (STAXI; Spielberger, 1988).** The STAXI is a 44-item scale measuring three primary components of anger: state anger, or the intensity of angry feelings at the current time (e.g., “I am mad”); trait anger, or individual differences in the disposition to experience anger (e.g., “I am a hotheaded person”); and anger expression, or the general frequency that anger is expressed (e.g., “I say nasty things”). Item responses range from 1 (not at all; almost never) to 4 (very much so; almost always). The STAXI has demonstrated excellent internal consistency reliability, extensive convergent validity across methods of measuring anger (e.g., anger-related thoughts, feelings, and behaviors measured in daily diaries and in response to provocation), and discriminant validity from other forms of negative affect (e.g., anxiety, depression, paranoid thinking) and unhealthy behaviors (e.g., frequent alcohol intoxication; Defenbacher et al., 1996; Spielberger, 1988). In the current sample, prior to beginning AMGT, mean state anger scores were $21.07$ ($SD = 7.85$), mean trait anger scores were $27.04$ ($SD = 6.37$), and mean anger expression scores were $39.20$ ($SD = 10.50$). It is notable that, on average, participants in this sample scored above the 95th percentile on each anger subscale (Spielberger, 1988). Internal consistency reliability coefficients were .94 for state anger, .88 for trait anger, and .88 for anger expression.

**Conflict tactics scale (CTS; Straus, 1979), modified for current study.** The CTS is the most widely used self-report measure of partner aggression, designed to assess the use of various behaviors during conflicts with an intimate partner. In the current study, we used the eight-item Physical Assault subscale of the CTS (e.g., “Have you kicked, bit, or hit someone with a fist?”) and modified it as follows: (a) To assess a wider range of physically aggressive behaviors, we assessed behaviors that were perpetrated against anyone, not only an intimate partner; (b) given findings of significantly increased physical aggression prevalence rates with the addition of one item (i.e., “Have you choked someone?”; Straus, 1990), we added this item to the measure; and (c) we assessed behaviors that occurred only during the past 3 months to ensure similar response periods pre- and posttreatment. Participants rated the frequency of each behavior on a 7-point scale, yet we summed the number of positively endorsed physical assault items to yield a total score ranging from 0 to 9, indicating the number of different types of acts engaged in during the assessment period. This method of summarizing physical assault data has been found to have more desirable psychometric properties than frequency scores (Moffitt et al., 1997). Specifically, it reduces skewness caused by a small number of highly aggressive participants, limits error introduced by subjective interpretation of aggressive behaviors (e.g., “beat someone up”), and is most defensible with respect to memory limitations regarding behavior frequencies. Approximately 34% of veterans in this study ($n = 29$) endorsed at least one act of physical assault during the 3 months prior to beginning AMGT. Among these participants, an average of 2.43 items ($SD = 2.80$) of physical aggression were used during this time. In the current sample, the internal consistency reliability coefficient for the Physical Assault subscale was .94.

**Minnesota multiphasic inventory II, antisocial practices scale (MMPI-II ASP; Butcher, Graham, Williams, & Ben-Porath, 1990).** The Antisocial Practices scale is the content scale of the MMPI-II that was developed to represent the broad construct of antisocial personality characteristics (Butcher et al., 1990). The ASP content scale is significantly correlated with antisocial and criminal behaviors (e.g., legal problems, impulsivity, aggression), as well as psychopathic personality traits (e.g., manipulativeness, fearlessness, externalization of blame, dishonesty), indicating that it assesses both domains of antisocial personality (Butcher et al., 1990; Lilienfeld, 1996). Of all aspects of antisocial personality, the ASP content scale is consistently most highly correlated with measures of Machiavellian egocentricity (i.e., a ruthless and self-centered willingness to deceive and manipulate others for personal gain). The ASP content scale maintains substantial discriminant validity from constructs such as alcohol use, depression, and histrionic personality (Lilienfeld, 1996). Participants responded to the full 567-item MMPI-II, including 22 true–false items representing the ASP content scale (e.g., “In school I was sometimes sent to the principal for bad behavior”; “I think nearly anyone would tell a lie to keep out of...
Responses were summed to yield a total score, then scaled to a uniform T score, which is percentile-equivalent across all MMPI-II clinical and content scales (Tellegen & Ben-Porath, 1992). In the current sample, participants had a mean uniform T score of 58.65 (SD = 13.62) on the ASP content scale. The internal consistency reliability coefficient was .83.

**Data Analysis**

To take advantage of the multilevel structure of the data, we did not assume independence of observations and we employed multilevel modeling, using the Hierarchical Linear Modeling 6.0 statistical program (Raudenbush, Bryk, & Congdon, 2004). Because this analysis is a random coefficients model, it does not assume homogeneity of rates of change across time. It also does not assume equal numbers of repeated observations, thus all Level 1 data were used and individuals with more data (i.e., those who completed pre- and posttreatment assessments) were given more weight in the parameter estimations. In cases of missing data across repeated observations, these parameter estimates are generally more reliable than estimations that require complete data for all individuals.

To examine change in each outcome variable (i.e., state anger, trait anger, anger expression, and use of physical aggression) from pre- to posttreatment, we constructed four intraindividual Level 1 change models, including one model for each outcome variable. We then constructed four Level 2 models to examine whether antisocial personality characteristics predicted change in each outcome measure (i.e., interindividual differences in intraindividual change). Pretreatment scores were considered a Level 1 control variable and degree of antisocial personality characteristics was a Level 2 predictor variable. All analyses used full information maximum likelihood estimation.

We used Cohen's (1988) suggestions for interpretation of effect size r (i.e., 0.10 = small, 0.30 = medium, 0.50 = large). Given the problems inherent in null hypothesis statistical testing (see Cohen, 1994), as well as the decreased likelihood of Type I errors using multilevel modeling, we emphasize the interpretation of effect sizes.

Similar to other anger management treatment outcome studies, a substantial number of participants (i.e., 23 participants, or 26.7% of the sample) did not complete the posttreatment assessment either because of dropping out of the treatment or not attending on the day of the final assessment. These participants did not differ significantly from those who completed the posttreatment assessment in terms of antisocial personality characteristics, t(67) = -1.04, ns, thus pretreatment data for these participants were retained in the analyses. Seventeen participants were excluded from multilevel analyses because of missing MMPI-II ASP content scale data. Participants who completed the MMPI-II did not differ from those who did not complete the MMPI-II in terms of age, t(79) = 0.16, ns, ethnicity, χ²(1) = 1.74, ns, marital status, χ²(1) = 0.37, ns, employment status, χ²(3) = 4.95, ns, service era, χ²(4) = 4.21, ns, service-connected compensation, χ²(1) = 0.04, ns, pretreatment state anger, t(66) = 0.75, ns, pretreatment trait anger, $t(68) = 1.23$, ns, pretreatment anger expression, $t(67) = 1.45$, ns, or pretreatment physical aggression, $t(46) = 0.13$, ns. Participants who completed the MMPI-II were found to have a higher level of education than participants who did not complete the MMPI-II, $χ²(6) = 12.91$, $p < .05$.

**Results**

Table 1 presents a correlation matrix for all study variables. Each relationship was in the positive direction. Nearly all subscales of the STAXI (i.e., State Anger, Trait Anger, and Anger Expression) significantly intercorrelated, both within and across pre- and posttreatment assessments. The only exception to this pattern was that posttreatment state anger did not correlate significantly with pretreatment trait anger and pretreatment anger expression. The MMPI-II ASP content scale did not correlate significantly with state anger at pre- or posttreatment, but it did correlate significantly with trait anger and anger expression at both pre- and posttreatment. The correlations between the MMPI-II ASP content scale and physical aggression pre- and posttreatment approached conventional levels of statistical significance. Pretreatment physical aggression perpetration correlated significantly with pretreatment anger expression, and statistical trends emerged between pretreatment physical aggression and pre- and posttreatment trait anger, as well as posttreatment anger expression. Posttreatment physical aggression perpetration correlated significantly with posttreatment state anger, trait anger, and anger expression. Finally, pre- and posttreatment physical aggression perpetration were significantly correlated.

**Table 1**

**Intercorrelations Among Study Variables**

<table>
<thead>
<tr>
<th>Variable</th>
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<td>2. State anger, Pre</td>
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<td>3. State anger, Post</td>
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<td>4. Trait anger, Pre</td>
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<td>5. Trait anger, Post</td>
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<td>6. Anger expression, Pre</td>
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<td>7. Anger expression, Post</td>
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<td>8. Physical aggression, Pre</td>
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<td>9. Physical aggression, Post</td>
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**Notes.** Because of missing data, similar absolute values of correlations may vary in terms of significance values; MMPI-II ASP = Minnesota Multiphasic Inventory II, Antisocial Practices content scale; Pre = pretreatment assessment; Post = posttreatment assessment.

* $p < .05$  ** $p < .01$  *** $p < .001$  **** $p < .10$
Table 2 displays the means (i.e., unstandardized coefficients) and robust standard errors of the intercepts and slopes for each outcome measure, as well as their associated tests of significance and effect sizes. The mean intercepts represent the pretreatment mean scores and the intercept tests indicate whether these scores differed significantly from zero. The mean slopes represent the rate of change from pre- to posttreatment, and the slope tests indicate whether the group as a whole significantly decreased on the outcome measures from pre- to postassessment. State and trait anger decreased significantly from pre- to posttreatment, represented by small to medium effect sizes. Change in anger expression (i.e., decrease during treatment) approached statistical significance, with an effect size in the small range. Participants reported a significant decrease in physical aggression, with a medium effect size, representing an average of 1.24 fewer types of physically aggressive acts perpetrated during the 3 months of treatment.

Table 3 displays the unstandardized coefficients and tests of significance for the relationship between the MMPI-II ASP content scale and each posttreatment outcome measure, after taking into account the respective pretreatment score. As expected, antisocial personality characteristics were significantly associated with smaller decreases in trait anger and physical aggression during treatment. Both of these relationships were represented by medium to large effect sizes. Antisocial personality characteristics were not significantly associated with smaller decreases in anger expression, but this association was represented by a medium effect size and approached statistical significance. Antisocial personality characteristics also were not significantly associated with state anger at posttreatment. However, a statistical trend with a medium effect size emerged, suggesting that antisocial personality characteristics may be associated with a larger decrease in state anger during treatment. Despite the trend levels of statistical significance, we believe the medium effect sizes of the latter two results yield them cautiously interpretable given the preliminary nature of the current study.

Discussion

Over the course of a 12-session cognitive–behavioral AMGT, this sample of veterans with PTSD reported small to medium reductions in state and trait anger, as well as small (but statistically nonsignificant) reductions in anger expression. These results extend the work of Chemtob, Novaco, Hamada, and Gross (1997), and cautiously suggest that cognitive–behavioral anger treatment may decrease, albeit to a limited extent, a wide range of forms of anger among this population. Study results also demonstrate that cognitive–behavioral AMGT may be effective in the reduction of physical aggression. Anger and PTSD have been found to lead to diminished social support over time (Evans et al., 2003; D. W. King, Taft, King, Hammond, & Stone, 2006; Lane & Hobfoll, 1992), and it has been proposed that the use of physical aggression may mediate this relationship (D. W. King et al., 2006). Because deterioration of social support has reciprocal consequences for PTSD symptoms (L. A. King et al., 1998), it is possible that the observed decreases in anger and aggression will serve to preserve social supports that can provide additional therapeutic benefits over time.

The current study is unique in that antisocial personality characteristics, a potential predictor of treatment resistance, were also examined. Results indicate that higher levels of antisocial personality characteristics were related to less reduction in trait anger and physical aggression during AMGT. Although the effect only approached statistical significance, we also observed a medium effect size for the association between higher levels of antisocial personality characteristics and less reduction in anger expression. Because the measure of antisocial personality that we used in the current study most strongly assesses self-centered interpersonal deceit and manipulativeness (Lilienfeld, 1996), it may be such interpersonal deficits that most strongly affected therapeutic progress (particularly given the interpersonal nature of group therapy). In fact, existing literature suggests that antisocial personality characteristics may diminish the positive effects of AMGT by impeding formation of a strong working alliance with treatment providers (Taft et al., 2004) and decreasing treatment engagement (Dolan & Davies, 2006). Given the high degree of comorbidity between PTSD and antisocial personality disorder (e.g., Kulka et al., 1998), as well as the conceptual overlap of study constructs, these mechanisms need to be specifically examined in future studies of anger treatment among veterans with PTSD. Such work should be conducted with an aim toward consideration of how treatment can be designed to overcome forms of resistance put forth by veterans high in antisocial personality characteristics. It is possible that such work could be extended to treatments for PTSD given that antisocial personality characteristics also have been found to be associated with a reduction in the effectiveness of PTSD treatment (Forbes et al., 2003).

Although the effect only approached statistical significance, we also observed a medium effect size suggesting that higher levels of antisocial personality characteristics may be associated with a
larger decrease in state anger during AMGT. Although speculative, this finding raises intriguing questions about the role of state anger during therapy with PTSD populations. Both positively and negatively valenced emotional experiences during CBT are increasingly recognized as therapeutically valuable (e.g., Goldfried, 2003; Teasdale, 1993), representing engagement in the therapeutic process, and associated with treatment gains in cognitive and cognitive-behavioral therapy (e.g., Castonguay et al., 1998; Castonguay, Goldfried, Wiser, Raue, & Hayes, 1996). Therefore, in conjunction with our findings indicating that antisocial personality characteristics are generally associated with less change in trait anger, anger expression, and physical aggression perpetration, we believe the association between antisocial personality characteristics and greater decrease in state anger during AMGT represents diminished engagement in the therapy process among those high in antisocial personality characteristics. These findings raise a need for further evaluation of the role of anger during therapy with PTSD patients and question research and theory suggesting that anger is used by individuals with PTSD to avoid the anxiety and fear that arises during treatment (Foa et al., 1995; Taylor et al., 2001). Indeed, researchers are beginning to question this proposition (Cahill et al., 2003; Pitman et al., 1996) and have proposed that the negative effect of anger on PTSD treatment outcome may be better accounted for by antisocial personality characteristics and related issues of diminished therapeutic alliance and increased externalization of blame (Forbes et al., 2003). Given existing controversy in the field and the fact that the current finding did not reach a traditional level of statistical significance (despite a medium effect size), caution must be used in interpreting the current results until direct tests and replication occur.

An alternative interpretation of the findings merits discussion. Specifically, given the study’s lack of a no-treatment control group, it is possible that the observed decreases in anger and aggression are due to regression to the mean effects. Three pieces of information may be used to temper this interpretation. First, veterans entered AMGT as part of a standard treatment protocol, typically after having received at least 24 weeks of prior group therapy, including a psychoeducational group and a stress management group. Thus, they likely did not enter AMGT at a point in time when their symptoms were at the most extreme. Second, because most participants completed two treatment groups prior to beginning AMGT, the current study results can largely be attributed to the specific skills taught during AMGT, rather than non-specific factors common to most treatments or associated with initiating therapy. Finally, among a similar sample of veterans with PTSD completing the stress management therapy group, state and trait anger, as well as anger expression scores from pre- to post-treatment varied from −.68 to +.58, suggesting that anger scores do not change dramatically over time, even when completing a treatment closely related to the skills taught during AMGT. (Data for physical aggression perpetration during the stress management group are not available.)

A second alternative interpretation is that the observed decreases in anger and aggression may be due to participant demand characteristics. Moreover, the association between antisocial personality characteristics and less change in trait anger, anger expression, and physical aggression may be due to veterans high in antisocial personality characteristics being less susceptible to demand characteristics. That is, veterans high in antisocial personality characteristics may be less motivated to report changes in anger and aggression, potentially because of lower levels of social desirability and fewer positive attitudes toward the treatment or treatment providers. However, the association between antisocial personality characteristics and a greater decrease in state anger tempers this latter interpretation.

An additional limitation of the current study concerns the nature of the study procedures given that the study included an effectiveness design conducted within the confines of routine clinical care. Although the current results are directly generalizable to the type of setting that the treatment is likely to be implemented in, the internal validity is limited in some respects. In particular, we do not know whether the fact that some participants completed individual psychotherapy or psychotropic medication management concurrent with AMGT systematically influenced the study results. We expect that additional treatment was provided to those participants who experienced the most distress or impairment, which likely included participants with higher levels of antisocial personality characteristics. Such a scenario would have provided a more conservative test of our hypotheses given that additional treatment would have helped to induce change during AMGT among participants high in antisocial personality characteristics. However, other possibilities are plausible (e.g., less antisocial and more highly motivated participants may have elected to engage in additional treatment) and should be taken into account in future study designs.

Despite these design limitations and related potential alternative explanations for study results, this study serves as an initial step toward demonstrating the effectiveness of AMGT for veterans with PTSD and identifying participant characteristics that may influence the effectiveness of this treatment. It also raises questions about the role of anger during therapy with PTSD populations. Across the entire sample, the changes in anger and aggression were less than ideal, suggesting that focusing on predictors of individual variability in response to treatment may be a fruitful direction in which to proceed. To continue to address these questions, research that includes an appropriate control group and follow-up assessments must be conducted. It is hoped that such work will examine ways in which treatment can be designed to address hypothesized mechanisms of action (e.g., the working alliance, interpersonal deficits, emotional arousal, treatment engagement) that may increase the effectiveness of AMGT among veterans with both PTSD and high levels of antisocial personality characteristics. Given the far-reaching effects of elevated anger, these are necessary steps to take to begin greatly affecting the lives of traumatized veterans.

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