# Unique Roles of Antisocial Personality Disorder and Psychopathic Traits in Distress Tolerance

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## Abstract

Previous research indicates that individuals with antisocial personality disorder (ASPD) evidence low distress tolerance, which signifies impaired ability to persist in goal-directed behavior during an aversive situation, and is associated with a variety of poor interpersonal and drug use outcomes. Based on theory and research indicating that psychopathic traits are associated with hypo-reactivity in emotional responding, a unique hypothesis emerges where psychopathic traits should have the opposite effect of ASPD and be related to high levels of distress tolerance. In a sample of 107 substance-dependent patients in an inner-city substance use residential treatment facility, this hypothesis was supported. ASPD was related to lower distress tolerance, while psychopathic traits were related to higher distress tolerance, with each contributing unique variance. Findings are discussed in relation to different presentations of distress tolerance as a function of psychopathic traits among those with an ASPD diagnosis.

Although much is known about the behavioral correlates and negative outcomes associated with antisocial personality disorder (ASPD), little is known about the mechanisms underlying this disorder. The limited data available suggest that conduct problems in youth, particularly aggressive behavior, is largely attributable to the combination of self-regulation deficits and the propensity to respond poorly to distressing emotions (Deckard, Petrill, & Thompson, 2007). Furthermore, engagement in aggressive and violent behavior may serve

an emotion regulation function (Bushman, Baumeister, & Phillips, 2001). Specifically, the belief that aggressive behavior will alleviate anger is associated with aggressive responses after a negative mood induction. Therefore, aggressive behavior among individuals with ASPD may indicate the unwillingness or inability to tolerate distress. Measures of distress intolerance have demonstrated substantial predictive validity with respect to various outcomes associated with the inability to tolerate negative affect, such as risk for early lapse following a smoking cessation attempt (Abrantes, Strong, Lejuez, Kahler, Carpernter, & Price, 2008), and duration of abstinence attempts among treatment-seeking substance abusers (Daughters, Lejuez, Bornovalova, Kahler, Strong, & Brown, 2005).

Daughters, Sargeant, Bornovalova, Gratz, & Lejuez (2008) examined substance users in drug treatment to investigate the relationship between ASPD and distress tolerance. Distress tolerance (DT) was defined as persistence in goal-directed activity while experiencing emotional distress during a psychologically stressful computer task that allowed early termination. The key outcome measure was persistence on the task once the termination option was available. Results demonstrated that patients with ASPD exhibited significantly lower levels of DT compared to non-ASPD participants. Although there is good reason to expect this link between low DT and ASPD, one might consider the opposite prediction for psychopathy, a related construct that is evident at meaningful levels in about 25% of individuals with ASPD (Blair, Mitchell, & Blair, 2005). Indeed, the core feature of emotional detachment in psychopathy would suggest the opposite relationship with DT than expected for ASPD, where higher psychopathic traits would be positively related to DT. Specifically, evidence suggests that individuals with the emotionally detached feature of psychopathy exhibit diminished physiological arousal in response to affective stimuli, despite evidence that they interpret stimuli as arousing. For example, emotional detachment has been shown to be related to reduced or absent startle reflex potentiation during exposure to threatening stimuli, despite no association between emotional detachment and self-reported arousal (Patrick, 1994; Patrick, Cuthbert, & Lang, 1994). Furthermore, divergent relations of ASPD and psychopathic traits to negative affect and emotional reactivity are consistent with the dual-deficit model of psychopathy (Fowles & Dindo, 2009), which asserts two etiological processes underlying psychopathy.

Taken together, those with a diagnosis of ASPD and higher levels of psychopathic traits may differ from those with ASPD and lower levels of psychopathic traits in the extent to which they are able to tolerate frustration. As such, the current study utilized a new sample from the same setting to replicate the previous finding by Daughters et al. (2008) that ASPD would be associated with low DT during a psychological stressor, but to extend these findings to examine the role of psychopathic traits. Specifically, it was hypothesized that psychopathic traits would be associated with higher levels of distress tolerance.

## Method

### Participants

Participants were 107 (91 men; 16 women) treatment-seeking individuals between the ages of 20 and 55 in a substance use residential treatment facility recruited within their first seven days of treatment. The average age was 41.1 years (SD = 9.2), and 61.3% of the sample earned less than $20,000 annually. The majority of the sample identified as Black or African-American (88.8%, followed by White or Caucasian [7.5%], Hispanic/Latino [0.9%], and "Other" [2.8%]). Fifty-nine percent of the sample reported having a high school degree or higher.

The treatment center requires that all residents undergo detoxification before treatment entry, thereby eliminating the possible residual effects of detoxification on outcome in our

sample. Individuals who met criteria for Axis I disorders (except psychotic disorders) were not excluded from the study in order to ensure generalizability of these findings to other individuals with ASPD.

## Procedure

Brief semi-structured interviews to determine DSM-IV psychiatric diagnoses were administered by trained graduate research assistants. Experimenters led participants in a muscle relaxation exercise prior to completing the distress tolerance tasks. The tasks were completed on laptop computers. The order of the behavioral tasks was determined randomly for each participant to limit the influence of order effects. All participants were paid in the form of a $25 grocery store gift card for their participation. To provide motivation during the computer tasks, participants were told that the amount of their payment was contingent upon their performance, but the specific details were not provided to keep the contingency somewhat vague and to prevent other factors such as reward sensitivity form overly impacting the results. After the task, they were informed how much money they had earned.

## Measures

**Demographic Information—**Information was obtained regarding age, race, education, marital status, and income.

**Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996)—**The PPI is a 187-item, self-report measure designed to assess the primary personality traits of psychopathy as described by Cleckley (1941). The PPI yields a total score, which is interpreted as a global index of psychopathy, and scores on eight subscales, which reflect traits of impulsive nonconformity, blame externalization, Machiavellian egocentricity, carefree nonplanfulness, stress immunity, social potency, fearlessness, and coldheartedness. The PPI also contains two validity scales intended to detect response styles of impression management, malingering, and random responding (i.e., Unlikely Virtues and Deviant Responding subscales). The PPI and PCL-R correlate at $r = .54$, suggesting a moderately high correlation between self-report and interview-based measures of psychopathy (Poythress, Edens, & Lilienfeld, 1998).

**Diagnostic Interview for DSM-IV Personality Disorders (DIPD-IV; Zanarini, Frankenburg, Sickel, & Yong, 1996)—**The DIPD-IV (Zanarini, Frankenburg, Sickel, & Yong, 1996) assesses 12 personality disorders including the 10 included in the DSM-IV as well as depressive and passive-aggressive personality disorders. For this study, we used the DIPD-IV to assess for ASPD. This interview has been found to compare favorably to the Structured Clinical Interview for DSM-III, with interrater coefficients ranging from .52 to 1.0 and test-retest reliability coefficients ranging from .46 to .85 (Zanarini, Frankenburg, Chauncey, & Gunderson, 1987). In our study, we used only a single rater and taping was not allowed by the center. Therefore, interviewers received extensive training and comprehensive weekly supervision to ensure the accuracy of diagnoses. During weekly supervision meeting, clinical questions were addressed, and group feedback about the appropriateness of diagnoses was offered. In cases of disagreement, discussion continued until consensus was reached and any agreed upon changes were made.

**Paced Auditory Serial Addition Task (PASAT-C)—**A modified computerized version of the PASAT (PASAT-C; Lejuez, Kahler, & Brown, 2003) was used as a psychological stressor to assess distress tolerance. In this task, numbers were flashed on a computer screen, and participants were asked to add the presented number to the previously presented number before the subsequent number appears on the screen. As the task was designed to limit the role of mathematical skill in persistence, the presented numbers only range from zero to 20,

with no sum greater than 20. Participants provided answers by using the mouse to click on their selection using pad displayed on the screen. Participants were told that their score increased by one point with each correct answer and that incorrect answers or omissions will not affect their total score. The task consisted of three levels. The first level lasted three minutes and started at a five-second latency and titrated based on skill, getting .5 seconds faster with each correct response and .5 seconds slower with each incorrect response, resulting in an average latency. The second level lasted three minutes, with the first two minutes using a constant latency set at 75% of the level one average latency and then an additional minute set at 50% of the level one average latency. Next the participant completed the negative affect scale and then moved to the final level also at 50% latency. Participants were informed that once the final level began they could terminate exposure to the task at any time by pressing any button on the keyboard; however, they were told that the amount of money they would make at the end of the session depended upon their performance on the task. Psychological distress tolerance was measured as latency in seconds to task termination. The experimental administration of a negative affect scale (see below) occurred at the end of the second level of the PASAT to determine if the task increased psychological stress. In previous studies with a non-titrating version we have controlled for skill level, but the titration ensures that the task is equally challenging for all participants when they are given the termination option.

**Computerized Mirror-Tracing Persistence Task (MTPT-C; Strong, Lejuez, Daughters, Marinello, Kahler, & Brown, 2003)**—The computerized version of the Mirror Tracing Persistence Task (MTPT; Quinn, Brandon, & Copeland, 1996) also was used to measure distress tolerance. In this task, participants were required to trace a red dot along the lines of a star using the computer's mouse. The mouse was programmed to move the red dot in the reverse direction. For example, if the participant moved the mouse to the left, the red dot moved to the right. To increase the difficulty level and frustration, if the participant moved the red dot outside of the lines of the star or if the participant stalled for more than two seconds, a loud buzzing noise sounded and the red dot returned to the starting position. Participants were told they could end the task at any time by pressing any key on the computer keyboard, but that their performance on the task affected how much money they would earn. After receiving instructions, participants completed two one-minute practice versions using only a straight line for one and an L-shaped figure for the second, both of which were low difficulty. After completing the second practice figure, the star was presented. Participants worked until they terminated the task or the five-minute maximum time was reached, at which point the task was terminated. Psychological distress tolerance was measured as latency in seconds to task termination.

**Negative Affect**—In line with previous studies using the distress tolerance tasks (Brown et al., 2002; Daughters et al., 2008), we measured negative affect using a four-item scale consisting of self-reported anxiety, difficulty concentrating, irritability, and frustration, with each item independently rated on a Likert scale. Reliability of the negative affect scale in the current study was good ($\alpha = .87$). A baseline administration of the scale occurred at the start of the session and an experimental administration was administered after the second level of the PASAT, and before and after the completion of the MTPT-C.

**Dependent measures**—The primary dependent measure was distress tolerance, measured as persistence in seconds on the PASAT-C and MTPT-C. The maximum score on each of these measures was 300s (5 minutes), which indicated that the participant completed the full 5 minutes of the task. One participant refused to participate in the final level of the PASAT and a separate participant refused to participate in the MTPT-C task. Scores were reflected and square root transformed to correct negative skew and reduce the impact of

outlying (low) scores in General Linear Model analyses (see Osborne, 2002). The final measures were re-reflected to maintain the interpretation of higher scores to indicate higher distress tolerance. A third ordinal dependent measure was created to indicate the number of tasks (0, 1 or 2) that were completed for the full 300s.

## Results

### Distress Tolerance Tasks

Participants persisted for an average of 212s ($SD$ = 119s; *range* = 6–300s) on the PASAT-C and 41% quit the task. On the MTPT-C, individuals persisted for an average of 194s ($SD$ = 109s; *range* = 9–300s) and 68% quit the task. Quit times across PASAT-C and MTPT-C tasks were significantly correlated, $r$ = 0.30, $p$ = .002. Paired sample t-tests indicated a significant increase in negative affect from pre- to post-task for both PASAT-C [$t(101)$ = −6.48, $p$ < .001] and the MTPT-C [$t(104)$ = −6.62, $p$ < .001], suggesting that both tasks were psychologically stressful. Participants who displayed greater increases in negative affect from pre- to post-task on PASAT-C also displayed less persistence on this task, $r$ = −0.32, p= .001. However, there was no significant association between changes in negative affect from pre- to post-task on the MTPT-C and persistence on this task. Negative affect change scores for the PASAT-C and MTPT-C tasks were regressed in separate analyses on ASPD diagnosis (Yes vs. No), PPI total score, and their interaction[i]. No significant effects were observed for either analysis which indicates that neither ASPD nor PPI scores predicted the change in negative affect observed during either task[ii]. Correlations among all dependent measures are presented in Table 1.

### ASPD and PPI Effects on Distress Tolerance Task Persistence Scores

Distress tolerance scores were analyzed in a mixed model General Linear Model (GLM) with Task (PASAT-C vs. MTPT-C) as a categorical within-subject factor, ASPD diagnosis (Yes vs. No) as a categorical between-subject factor, and PPI total score as a quantitative between-subject factor. The interaction between ASPD diagnosis and PPI total score was also included. Partial eta-squared ($p\eta^2$) effect size estimates are reported for all significant effects. Standardized GLM regression coefficients ($\beta$) are reported as an additional effect size estimate and to indicate direction of effects. ASPD diagnosis and PPI Total score are non-orthogonal independent variables ($r$ = 0.28, $p$ = .004). Therefore, tests of each of their effects represent unique effects holding the other constant at its mean. Raw task persistence scores by ASPD diagnosis and PPI total score are displayed in Table 2.

The main effect of Task was marginally significant, $F(1,103)$ = 2.98, $p$ = .087, $p\eta^2$ = .03, $\beta$ = 0.20, suggesting that participants persisted somewhat longer on the MTPT-C vs. the PASAT-C task. A significant main effect of ASPD diagnosis was observed, $F(1,103)$= 4.16, $p$ = .044, $p\eta^2$ = .04, $\beta$ = −0.21, indicating that participants with ASPD diagnoses displayed approximately 0.2 standard deviations lower mean distress tolerance scores across the two tasks than did participants without an ASPD diagnosis. A significant main effect of PPI total score was also observed, $F(1,103)$ = 3.97, $p$ = .049, $p\eta^2$ = .04, $\beta$ = 0.21, indicating that for every one standard deviation increase in PPI scores, participants displayed a 0.2 standard deviation increase in mean distress tolerance across the two tasks[iii]. Task did not

[i]The magnitude and direction of the main effects of ASPD and PPI total were essentially unchanged for analysis of raw (non-transformed) distress tolerance scores. Specifically, $\beta$ = −.18 and .21 for ASPD and PPI respectively. Statistical tests of these GLM coefficients should be interpreted cautiously given the non-normal distribution for raw distress tolerance scores. However, both main effects were at least marginal for the raw scores ($p$'s = .09 & .05 for ASPD and PPI respectively).

[ii]Analyses all were re-conducted controlling for change in negative affect on either task to ensure that the results were being driven by tolerance of distress above and beyond the level of negative affect experienced during the tasks. This is consistent with previous studies using this methodology (Daughters et al., 2005).

significantly moderate either the ASPD or the PPI effects ($p$'s = .957 & .875, respectively), indicating that the magnitude of the APSD and PPI effects were consistent across both distress tolerance tasks. The ASPD X PPI interaction was not significant ($p$ = .851), indicating that the unique effects of each of these variables on distress tolerance was comparable across levels of the other variable.

Additional regression analyses were conducted separately to determine if the ASPD or PPI effects described above were moderated by participant characteristics including gender, age, education level (high school degree: yes vs. no), or race (African American vs. Other). No significant moderating influence was observed for any of these subject characteristics on the ASPD or PPI total score effects.

### ASPD and PPI Effects on Distress Tolerance Task Completion

As an alternative analytic strategy, DT task completion scores (number of tasks completed: 0 – 2) were analyzed with an ordinal regression (SPSS Polytomous Universal Model) with ASPD diagnosis (Yes vs. No) as a categorical between subject factor, and PPI total score as a quantitative between subject factor. The interaction between ASPD diagnosis and PPI total score was also included. Task completion rates by ASPD diagnosis and PPI total score are displayed in Table 2.

Consistent with the results from analyses of DT task persistence time, a significant main effect of ASPD diagnosis was observed, Wald (1)= 6.78, $p$ = .009, indicating that participants with an ASPD diagnosis had a lower DT than did participants without an ASPD diagnosis. A significant main effect of PPI total score was also observed, Wald (1)= 5.31, $p$ = .021, indicating that higher PPI total scores were associated with higher rates of DT. The ASPD X PPI interaction was not significant ($p$ = .434), indicating that the unique effects of each of these variables on DT was comparable across levels of the other variable. As with analyses of DT task persistence times, additional analyses evaluated the possible moderating effects of participant characteristics including sex, age, education level and race. None of these participant characteristics moderated the ASPD or the PPI total score effects.

### PPI Subscales

The PPI yields subscale scores in addition to the total score included as a predictor in earlier analyses. Individual partial correlations were calculated between each PPI subscale and DT persistence scores to determine which subscales contributed to the total PPI score effect. ASPD scores were partialled from these correlations consistent with earlier analyses that reported unique effects of PPI total score. Significantly positive partial correlations were observed between DT persistence scores and Fearlessness ($pr$ = 0.29, $p$ = .003), Impulsive Nonconformity ($pr$= 0.20, p= .040), and Deviant Responding ($pr$ = 0.27, $p$ = .005). Marginal partial correlations were observed for Social Potency ($pr$ = 0.18, p= .070) and Carefree Non-planfulness ($pr$ = 0.17, $p$ = .080). The partial correlations for Machiavellian Egocentricity ($pr$ = 0.08, $p$ = .447), Coldheartedness ($pr$ = .04, $p$ = .723) and Stress Immunity ($pr$ = 0.02, $p$ = .864) were not significant. A final multiple regression analysis was conducted to examine the unique effects of each PPI subscale, controlling for ASPD, and the other PPI subscales. Significant unique effects were observed for Deviant Responding ($\beta$ = 0.32, $p$ = .009) and Coldheartedness ($\beta$ = 0.34, $p$ = .015). A marginal effect was observed for Fearlessness ($\beta$ = 0.24, $p$ = .082). No other significant unique effects were observed for PPI subscales.

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[iii]In all analyses, PPI total score was mean centered and standardized (i.e., $M$ = 0, $SD$ = 1). ASPD diagnosis was coded with unweighted, centered coefficients (0.5 vs. −0.5 for Yes vs. No, respectively).

## Discussion

Previous research indicated that individuals with ASPD exhibit distress tolerance deficits compared to those without ASPD (Daughters et al., 2008), suggesting that individuals with ASPD have an inability to tolerate emotional distress while pursuing goal-directed behavior. However, one limitation of Daughters et al. (2008) was the absence of an examination of the role of psychopathic traits, which often co-occur with ASPD, despite such traits being consistently associated with diminished emotionality (e.g., Patrick, 1994). Findings from the current study indicate that ASPD significantly predicted lower distress tolerance, whereas psychopathic traits predicted higher distress tolerance. These effects held whether distress tolerance was conceptualized as task persistence latency or as an ordinal variable indicating the number of tasks completed. Further, there were no effects of ASPD and PPI on the self-reported experience of distress on the tasks, thereby suggesting that psychopathic traits and ASPD have direct and unique effects on the *response* to distress. These findings highlight the discriminability of psychopathic traits and ASPD with respect to their behavioral and emotional profiles.

Further analyses exploring the unique contributions of each of the eight PPI subscales to distress tolerance found that Coldheartedness (poverty of emotional experience) and Deviant Responding accounted significantly for the relationship between psychopathic traits and DT. Although the Deviant Responding subscale was designed to detect malingering and random responding to questionnaire items, this pattern of responding may be tapping a response style that is linked to psychopathic personality features.

The unique relationship between the Coldheartedness subscale and DT, and a relationship approaching significance for the unique relationship between fearlessness and distress tolerance when controlling for ASPD fits well with study hypotheses. Specifically, the endorsement of items linked to lack of feeling (*Coldheartedness*) and to and the absence of anticipatory anxiety regarding harm and willingness to engage in risk-taking behaviors (*Fearlessness*) may have served to reduce the need for escape from the distressing task. Stress immunity was not uniquely related to DT, ASPD, or to psychopathic traits. This may indicate that it is not one's immunity to distress of the task that is relevant but rather one's response to distress, for which the relationship with general lack of feeling and fearlessness may be especially relevant.

Although the preliminary nature of this work brings with it a range of limitations, there are two that are of particular note. First, our recruitment was limited to low-income African-Americans seeking substance use treatment which impacts generalizability to other samples. A second limitation was the method of assessing increases in negative affect related to the distress tolerance tasks. Although participants reported an increase in distress following both tasks here and in several other previous studies (e.g., Daughters et al., 2005), a more precise approach would have been to include a third task which was not meant to induce distress to determine if increases in negative affect were specific to the distressing aspects of the task or simply the repeated assessment.

Beyond limitations, the current study provides a well-controlled examination isolating separate effects of ASPD and psychopathy on distress tolerance. These findings are consistent with both the dual-process theory of psychopathy (Fowles & Dindo, 2009) wherein two distinguishable behavioral and emotional profiles have consistently emerged across numerous studies (e.g., Patrick, 1994), as well as Gray's (1981) two factor learning theory, wherein psychopaths exhibit a weak Behavioral Inhibition System (BIS), limiting response-contingent avoidance of punishment (i.e., negative reinforcement). From these perspectives, an important direction includes understanding how those with ASPD but low

levels of psychopathic traits may be especially at risk for reactive aggression or other impulsive actions related to violence and aggression. Among those who engage in aggression, research suggests two distinctive subsets of individuals who present with elevations in either instrumental or impulsive aggression (Stanford, Houston, Mathias, Villemarette-Pittman, Helfritz, & Conklin, 2003). Along these lines, the perhaps low DT may explain engagement in impulsive versus instrumental aggression among individuals with ASPD and varying levels of psychopathic traits.

The current findings also lead to clinically relevant lines of research. Although clinical lore maintains that ASPD and psychopathic traits are untreatable, Salekin's (2002) review of 42 psychopathy treatment studies suggested that there is little support for this idea. Instead, evidence suggested that current treatments are not well informed by basic research. Moreover, treatments have targeted other disorders related to ASPD and psychopathic traits without known underlying mechanisms responsible for the clinical manifestation of the disorder. This study, and a previous study investigating the relationship between ASPD and distress tolerance (Daughters et al., 2008), have highlighted differing emotion regulation profiles which may be present in individuals with ASPD, and which may guide treatment decisions.

## Acknowledgments

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**Table 1**

Correlations among Task Persistence, Task Completion, and Change in Negative Affect for PASAT-C and MTPT-C Tasks.

|  | PASAT-C Time | MTPT-C Time | Total Completion Time | Number of Tasks Quit | PASAT-C Dysphoria Change |
|---|---|---|---|---|---|
| MTPT-C Time | .32 ** | | | | |
| Total Time | .83 ** | .80 ** | | | |
| Tasks Quit | .77 ** | .68 ** | .89 ** | | |
| PASAT-C Dysphoria Change | .31 ** | −.20 * | .08 | .16 | |
| MTPT-C Dysphoria Change | .22 * | .01 | .15 | .23 * | .35 ** |

*
$p < .05$,

**
$p < .01$

**Table 2**

Task Persistence and Task Completion by Task, ASPD Diagnosis, and PPI Total Score.

| ASPD | PPI | N | Task Persistence | | | Task Completion | | |
| | | | PASAT-C | MTPT-C | Mean Time | PASAT-C | MTPT-C | # Tasks Completed |
|---|---|---|---|---|---|---|---|---|
| No | Low | 44 | 213.3 (117.9) | 180.7 (113.0) | 197.0 (94.4) | 59.1% | 29.5% | 0.9 (0.7) |
| No | High | 33 | 224.2 (125.0) | 227.5 (98.4) | 225.9 (90.6) | 69.7% | 55.4% | 1.2 (0.8) |
| Yes | Low | 10 | 172.0 (136.8) | 156.6 (122.9) | 164.3 (106.8) | 40.0% | 10.0% | 0.5 (0.7) |
| Yes | High | 20 | 209.7 (108.8) | 185.6 (101.6) | 197.6 (78.1) | 50.0% | 25.0% | 0.7 (0.8) |

NOTE: PASAT-C is the Paced Serial Addition Task- Computerized version. MTPT-C is the Mirror Tracing Persistence Task- Computerized version. Task persistence is measured as time (in seconds) until participant discontinued (max = 300s). Task completion indicated percent of participants who completed each task and mean number of tasks completed. PPI was median split to form low and high PPI groups. As reported in the text, main effects of ASPD diagnosis and PPI scores were observed for task persistence across the two tasks ($p$'s = .044 & .049, respectively). Similarly, main effects of ASPD diagnosis and PPI scores were observed for task completion ($p$'s = .009 & .021, respectively).