

Research Article

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# A Quantitative Study Evaluating the Relationship between Psychopathic Traits and Cognitive Abilities in the Substance Abuse Population

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## Abstract

Psychopath is a cluster of emotional deficits and antisocial behaviors, which continues to spark interest in the mental health community as well as the general public. Even though research over the past two decades has provided many clarifications regarding psychopath, many unknowns still linger. The purpose of the study was to examine the association between psychopathic tendencies and intelligence. In the study, psychopathic traits were evaluated using the Antisocial Scale (ANT) of the Personality Assessment Inventory (PAI) and intelligence was measured using the Wechsler Adult Intelligence Scale (WAIS-IV). The sample was comprised of archival assessment data of clients from a community mental health clinic (N=30). Archival data consisted of subjects who endorsed difficulties with substance use and had elevated ANT scores. The results of the study found that subjects with higher education had lower antisocial scale scores. Additionally, individuals with higher antisocial scale scores had slower processing speed as indicated by the Processing Speed Index (PSI) subscale of the WAIS IV. This study suggests that individuals with psychopathic traits may have difficulty processing and encoding information quickly and accurately. Problems in processing speed may lead individuals to have emotional regulation issues and judgment impairments. The study highlights the importance of creating treatment protocols that address the cognitive processing issues of individual's with anti-social or psychopathic tendencies. Moreover, the study results underscore the necessity of developing treatment regimens that can be easily followed and adhered to by this population.

**Keywords:** Psychopath; Psychopathic Traits; Substance Use; Cognitive Abilities; Intelligence

## Introduction

Psychopath is defined as a cluster of personality characteristics, emotional deficits, and antisocial behaviors. A person with psychopath is often seen as callous, manipulative, and lacking remorse or guilt for breaking social norms [1,2]. Individuals who fit this description are referred to as psychopaths. Psychopaths often lack empathy for another human being and are unable to form meaningful and intimate relationships with others [1]. In the past few decades with the rise of the social media, reality TV, and true crime shows, psychopath has received a substantial amount

of attention from the public. Frequently, the horrific serial killers, rapists, or murderers are the quickest to be labeled as psychopaths. Nevertheless, offenders with drug charges, gang members, and sex offenders also fit the criteria since the common thread in all of these crimes is a lack of consideration for another life [1].

Another common misconception is that every psychopath is a criminal. Experts report between 1-4% of the general population (i.e. non-criminals) that has been tested meets the criteria for psychopath [3,4]. While a 1-4% prevalence may seem small,

schizophrenia, a more well, is also diagnosed in only about 1% of the general population [4]. Therefore, even though psychopath is often associated with criminal behavior, it is relatively common for individuals with psychopath to be living a non-criminal life in the community. Most psychopath research focuses on the criminal justice field because that is where psychopathic individuals are easiest to find [5]. Around the 1970s, however, researchers begun to study psychopath in the non-criminal population, referring to it as a successful psychopath, high-functioning psychopath, or adaptive psychopath [6]. The research findings suggested non-criminal or successful psychopaths skillfully use their personality traits, like boldness, charisma, charm, fearlessness, and lack of guilt or remorse, to be very successful in life [5]. Though, the successful psychopaths might be leading a prosperous life, and not engage in criminal behaviors, they still cause chaos in their relationships and workplace [3]. Babied and Hare explain that many psychopaths are the unreliable friend who always takes advantage of others, or the unsupportive and parasitic family member preying on the gullible grandparent [3]. The main distinction between a non-psychopathic and psychopathic person is the motivation to take advantage of others to get what they want without consideration for another person [3]. Therefore, even though they often are not the most desirable people to be around, they also tend to be very successful in high-stake settings and professions. Consequently, these individuals tend to be found in professions which require a minimal or complete lack of emotional or personal involvement, such as politics, business, military, high-risk sports, or law enforcement [5]. Even though individuals who fit the criteria for psychopath are not always criminals, the research regarding psychopath tends to focus on the criminal population. Offenders with psychopath frequently have a lengthy and diverse criminal record, are more likely to reoffend, and commit crimes that are calculated and goal-oriented rather than reactive or emotion driven [7].

The topic of psychopath is very complex. First, the public misuses the term psychopath by calling most criminals "psychopaths," who is incorrect since the majority of criminals are not psychopaths. Researchers report that only about 15% of incarcerated individuals meet the criteria for psychopath [3]. Another issue adding to the complexity of the matter is the use of the term sociopath and psychopath interchangeably [3]. This arises from the disagreement regarding what causes a person to exhibit psychopathic traits. Clinicians, researchers, and professionals who believe that psychopath is solely a product of society use the term sociopath. Clinicians, researchers, and professionals who believe that there is a biological and psychological component use the term psychopath. Psychopath is often confused with the antisocial personality disorder (ASPD). It is important to note that Psychopath is not considered an official, stand alone, mental health or personality disorder in the Diagnostic and Statistical Manual of Mental Health

Disorders (DSM). The term has been used interchangeably when describing antisocial personality disorder in the DSM-II through DSM-5. Dr. Hare argues that this creates confusion and is an inaccurate use of the term [8,9]. Dr. Hare stresses even though there are similarities between ASPD and Psychopath, such as callousness, impulsivity, and lack of remorse, or regard for other people, there are prominent differences between the two conditions [8]. Antisocial Personality Disorder mostly consists of criminal behaviors and activities, whereas Psychopath also includes certain personality traits, and character logical flaws often combined with socially unacceptable acts and behaviors [1]. Individuals who suffer from ASPD frequently disobey social rules, are involved in acts that lead to arrests, struggle with controlling their anger and impulses, and are irresponsible [10]. Conversely, as previously established, not all individuals who meet the criteria for Psychopath are involved in the criminal justice system. Some psychopaths lead average lives, but might be described as unpleasant, cold, superficial or manipulative [3,8]. In addition, many psychopaths are also capable of being very successful, especially in jobs that require lack of emotional involvement, such as investment or legal firms [3].

Diagnosing Psychopath is challenging due to the many discrepancies between what defines Psychopath, and disagreements on what causes it [11]. It is also difficult to identify individuals with Psychopath because they very rarely seek therapy voluntarily. The ones that do pursue treatment, or a psychological assessment, are most likely court ordered and participate unwillingly [11]. To diagnose Psychopath, professionals use multiple methods such as brain imagining, personality assessments, and intelligence testing, as well as medical and family history. The most popular assessment tool used to assess Psychopath is the Psychopath Checklist-Revised (PCL-R). Dr. Hare developed the test in the 1970s. The test is known to be one of the most reliable and valid tests assessing Psychopath. The most apparent limitation is the restricted accessibility. Clinicians must go through specialty training before they are considered competent to use the PCL-R assessment. Therefore, researchers continue to develop alternative measures such as the Evensong Primary and Secondary Psychopath Scale (LPSP), and Psychopathic Personality Inventory (PPI). Moreover, personality assessments such as Minnesota Multiphase Personality Inventory-2 (MMPI-2) and Personality Assessment Inventory (PAI) contain subscales that are able to detect the presence of psychopathic features and traits [12-14]. In the past decade, researchers have also focused their research on the neurobiology of Psychopath. Available literature suggests that Psychopath might be rooted in biological abnormalities in the brain. Research posits the lack of emotional reactivity may be caused by faulty connectivity that affects the emotional regions (limbic system and frontal cortex) of the brain causing callous behaviors in Psychopath [15].

Psychopath has average to above average intelligence [16]. Conversely, there are some studies reporting that a true psychopath has below average intelligence [17-19]. One possible source for this discrepancy or lack of consistency in studies is that most studies have relied on the relationship between Full scale IQ (FSIQ) and Psychopath. Full scale IQ is an estimate of an individual's cognitive abilities when compared with the general population [20]. The score combines verbal, perceptual, memory and processing abilities to estimate overall cognitive level. In the process of combining and averaging the scores, important information might be overlooked. Therefore, while analyzing a complex condition such as Psychopath, breaking the FSIQ into the cognitive subcategories might provide more information that is beneficial in the successful treatment of psychopathic individuals.

### Statement of the Problem

Psychopath has become a popular and commonly used term. Thus far, it has been successfully linked to criminal behaviors, substance use, and an inability to form successful interpersonal relationships or express empathy towards other human beings [22-24]. One aspect researcher has not been able to agree on is whether or not there is a correlation between intelligence and Psychopath. Some theorists express that individuals with psychopathic traits have high IQ, and others disagree [19,25-27]. Furthermore, there have been questions whether or not cognitive abilities are an important factor that should be considered when treating individuals who exhibit psychopath traits and struggle with substance abuse [24,28,29]. The fundamental challenge that researchers might face when assessing intelligence in psychopathic individuals is the use of Full-Scale IQ. Typically, the Wechsler Adult Intelligence Scale-IV (WAIS-IV), a psychometrically sound test, is used to assess FSIQ. The WAIS -IV has various subtests testing different cognitive abilities, which are then combined to form the Full-Scale IQ of an individual [20].

Using only FSIQ might be one limitation when examining the relationship between IQ and Psychopath. Looking at the overall FSIQ scores and also exploring the individual subtest scores of the WAIS-IV might allow for a more accurate discovery of strengths and weaknesses in specific cognitive areas. This may be the key to solidifying the relationship between intelligence and Psychopath. Furthermore, examining the subtests scores may show differences in cognitive processing of psychopathic individuals that are obscured in the FSIQ. Thus, looking at specific cognitive abilities such as processing speed, short term memory, verbal fluency, and perceptual reasoning may assist clinicians at identifying specific intellectual strengths and weaknesses associated with Psychopath.

Another challenge that arises is the assessment of Psychopath. The most robust assessment instrument, the Psychopath Checklist-Revised (PCL-R), is not easily accessible, requires extensive

training, and certification. As a result, researchers have to resort to other assessments that might not be as accurate or precise. The PAI is a routinely used assessment to determine personality and psychopathological functioning. The Antisocial Scale (ANT) of the PAI has been shown to actively tie into psychopathic traits, although it is not the strongest Psychopath assessment [14]. The Antisocial subscale was created to evaluate personality pathology based on the Psychopath characteristics described by Bleckley and Hare [9, 25]. Dr. Hare based his formulation of Psychopath on Cleckley's formulation [25]. Cleckley's conceptualization of Psychopath centers on personality characteristics, such as anxiety or lack of remorse, rather than focusing on criminal and delinquent behaviors associated with the DSM III's definition of Antisocial Personality Disorder [14,30]. When creating the PAI's Antisocial subscale, Morey included items that evaluated criminal and delinquent behavior factors, as well as personality features to encompass both Psychopath and antisocial personality disorder [14]. Importantly, researchers found moderately strong correlation between the ANT of the PAI and the PCL-R, suggesting both scales similarly assess for presence of psychopathic traits [31]. Therefore, using the PAI might be an acceptable alternative in preliminary screenings for Psychopath.

The presence of problematic substance use has been shown to be associated with psychopathic personality characteristics [28,29,32-34]. Researchers have not been able to find clear reasons why substance use and psychopathic tendencies strongly correlate with one another. Some conceptualize that the link between Psychopath and drugs use is that both are associated with criminal behavior [29,36]. Others have speculated that psychopathic and substance using individuals share analogous personality traits, such as impulsivity, irresponsibility and unstable lifestyle [35-37]. Studies have notably found that psychopathic traits increase attrition rates in substance abuse treatment in both female and male individuals [35,36,38]. Individuals who do not exhibit psychopathic traits tend to complete substance abuse treatment more often than individuals who exhibit psychopathic traits. Thus, identifying individuals with both Psychopath and substance abuse would be important as it seems that these two disorders are related or co-occur. The PAI can measure Psychopath using the ANT scale, but it can also evaluate addiction propensity through the following subscales: The Alcohol Scale (ALC) and Drug Scale (DRG) [14]. Thus, the PAI can assist clinicians in screening for psychopathic traits, alcohol use, and drug use since it is less cumbersome to administer and more widely used than the PCL-R [23,32].

Most studies examining the relationship between Psychopath and intelligence have relied heavily on Full Scale IQ and the results of the PCL-R. Using FSIQ with individuals diagnosed with Psychopath has yielded mixed results. The FSIQ may be inadequate at explaining the relationship between Psychopath and intelligence

since it gives a general intelligence quotient rather than identifying specific cognitive attributes. Additionally, the PCL-R is a sound instrument, but requires certification to administer making it more difficult to access by clinicians. Thus, using the PAI which is routinely given by clinicians may serve as a satisfactory measure of Psychopath, as studies have asserted that the PAI antisocial scale is correlated with the PCL-R.

Thus, the current study sought to uncover a clearer link between Psychopath and intelligence by examining the relationship between the PAI Antisocial scale and the WAIS sub scales. This study was unique as it highlighted distinctive cognitive processes rather than overall intellectual development. Knowing the cognitive strengths and weakness associated with Psychopath may help with creating appropriate treatment protocols to promote successful treatment completion. The research has clearly shown that individuals with psychopathic traits have generally been seen as treatment resistant. Understanding the ways in which information is retrieved and processed by individuals with psychopathic traits is an important step in the creation of treatment regimens that meet their unique needs.

## Methods

### Participants

All data included within the study was acquired from archived assessment files of participants that have previously received psychological assessment services between 2011 and 2016

from doctoral psychology students being trained at the Argosy University Therapeutic Assessment Services (AUTAPS) mental health clinic at Argosy University in Orange County, California. The sample size for the current study was 30 completed, archived assessment batteries. The archival files selected for inclusion in the study had the following: 1) informed written consent allowing their data to be used in ongoing research; 2) a score of 65 or higher on the Antisocial subscales of the Personality Assessment Inventory (PAI) [14]; 3) Completed results of The Wechsler Adult Intelligence Scale –IV (WAIS-IV), and presence of substance abuse indicated by scores of 65 or above on the alcohol and/or drug scale of the PAI. Permission to examine the archival information was obtained from the Clinic Director at AUTAPS.

The mean (M) subject age of the sample (N=30) was 24.5 years with Standard Deviation (SD) of 4.23. The age distribution of the population was between the ages 18 years old and 33 years old, with the most prevalent age of 22 at 16.7%. The majority (73.3%) of the participants was in their twenties (see Figure 1.) A total of 16 males (53.3%), and 14 females (46.7%) participated in the study. The study included 70% Caucasian participants, 20 % participants identified as “other”, 6.7 % identified as Hispanic, and 3.3% as Asian (see Figure 2). Sixty percent of the participants reported their education level to be “some college”, 23.3% reported high school diploma, 13.3% “college graduate”, and 3.3% stated that they have attended graduate school (see Figure 3).

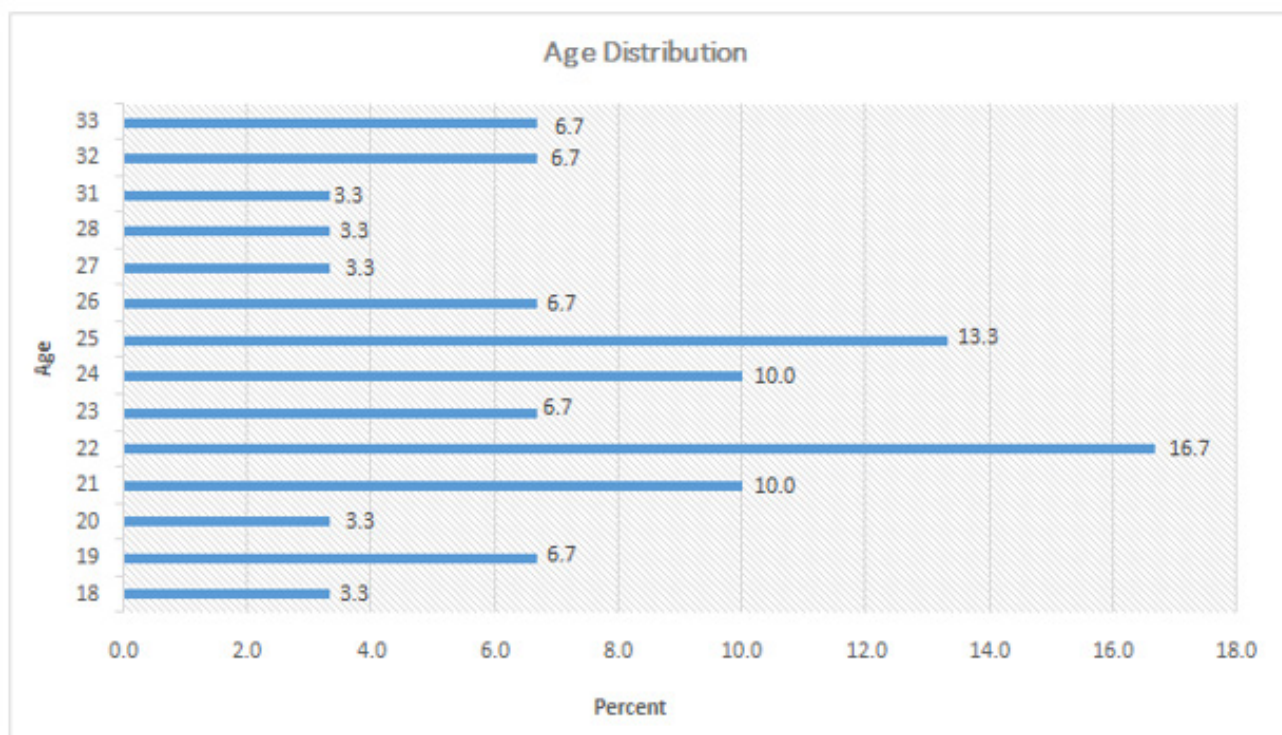
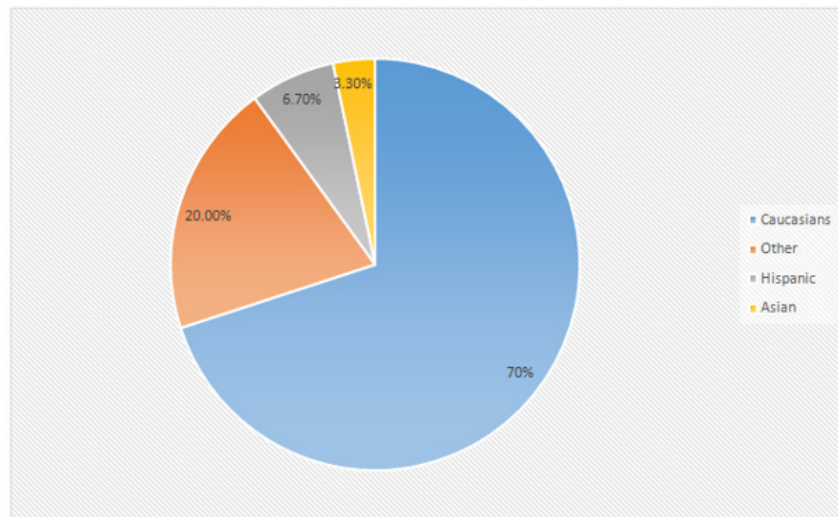
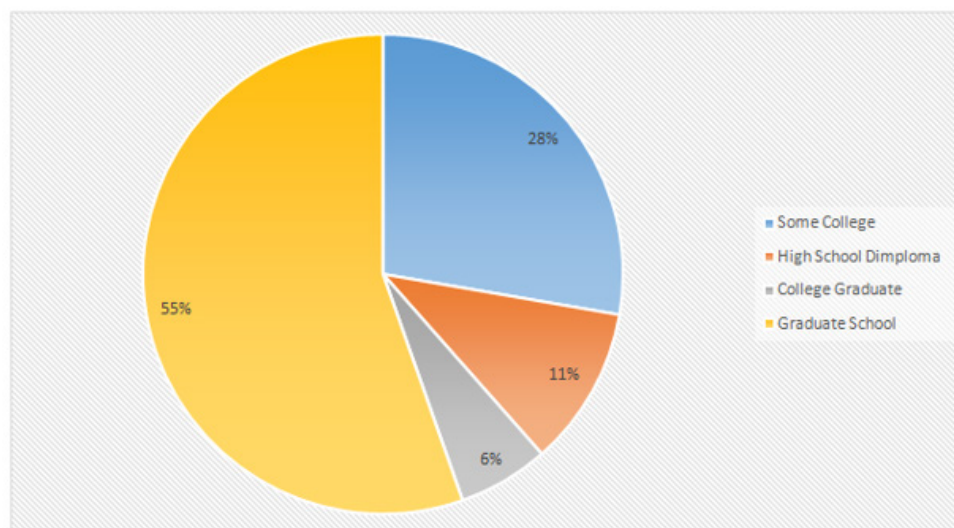


Figure 1: Participants' Age Distribution



**Figure 2:** Percentages for Participants' Ethnicity



**Figure 3:** Percentages for Participants Education Level

## Measures

**Demographic Information** - Demographic information of age, gender, ethnicity, and education level was collected from the files of each participant. Personality Assessment Inventory (PAI) - Each participant has been administered the PAI during their psychological assessment and their scores on the antisocial subscale were examined in the current study [14]. The PAI is a self-report personality instrument with 344 items that are answered on a 4-point Likert scale. Results from this instrument consist of 22 non-overlapping scales designed to broadly measure various mental disorders and personality factors. These scales include four validity scales, 11 clinical scales, five treatment scales, and two interpersonal scales; 10 of these scales contain additional subscales. The PAI was normed on a U.S. Census-matched sample of

over 3,000 adults in community, clinical, and college settings; this allows PAI profiles to be generalizable to both general and clinical populations.

The median internal consistency of the PAI scales in each normative sample is considered to be good ( $\alpha = 0.81$  to  $0.86$ ), while the internal consistency for the PAI subscales ranges from poor to good ( $\alpha = 0.51$  to  $0.89$ ). The PAI also demonstrates strong test-retest reliability correlations for the PAI full scales ( $r = 0.68$  to  $0.92$ ) and subscales ( $r = 0.68$  to  $0.85$ ). Validity studies that compared the PAI full clinical scales and subscales to other measures of psychopathology indicated that correlations with instruments designed to measure similar constructs ( $r = 0.09$  to  $0.89$ ) and dissimilar constructs ( $r = 0.00$  to  $0.75$ ) ranged from being weak to strong.

The Wechsler Adult Intelligence Scale (WAIS) - Each participant was also administered the adult intelligence test using the WAIS during their psychological assessment [20]. Their scores on this instrument were examined and compared in the current study to the antisocial subscale scores of the PAI. The WAIS intelligence test is currently in its fourth edition. It contains 15 subtests divided into four scales: Verbal Comprehension, Perceptual Reasoning, Working Memory, and Processing Speed. The four scales collectively provide a Full Scale IQ [20]. Each individual scale provides information regarding strengths and weaknesses of a person's abilities for self-monitoring, problem solving, impulse control, and cognitive flexibility [20]. Respondents are asked to participate in tasks that evaluate their ability to solve arithmetical questions, general knowledge and vocabulary, ability to memorize, recall, and ability to problem solve. WAIS is a standardized assessment that was developed to assess intelligence and cognitive abilities in adolescents and adults [20].

Standardization of WAIS-IV was derived from a sample of 2,200 individuals ranging in age from 16-90 years old. The age groups were divided into 9 subgroups from 16 to 69 years old, containing 200 participants, and four groups from 70 to 90 years old containing 100 participants in each. To strengthen the standardization of the test, creators included different ethnic groups including Euro-Americans, African Americans, Hispanic-Americans, Asian-Americans and Other, as well as participants of both genders [20]. The reliability coefficient for the WAIS-IV is considered to be very high for every individual scale ( $M r = .93-.96$ ), and the FSIQ ( $M r = .97-.98$ ). Information on the WAIS-IV's test-retest reliability suggests that the test provides constant results over time for the four scales and FSIQ, ranging from .76 to .96 [20]. The criterion validity between the scale was reported to be satisfactory ( $r = .84$  to .94) depending on the subtest being examined [20]. The construct validity indicates that WAIS-IV is an appropriate measure to assess intelligence in adolescents and adults [20].

## Procedures

Data for this study was retrieved from archived files of participants that have previously received psychological assessment services at the AUTAPS mental health clinic. Prior to beginning the assessment process, AUTAPS policy mandates that all participants must be presented with a written informed consent document that allows participants to authorize their assessment data to be included in an ongoing subject pool for future research. Assessment data was only collected from files that contained a signed informed consent document. Each of these files was then reviewed individually by the primary investigator to determine if their content meets the current study's inclusion criteria. When information in the participant's file met the inclusion criteria, scores from the PAI and WAIS were collected and denoted in an excel spreadsheet. Participants' names

were not included on the spreadsheet. Each participant was given an ID number. Demographic variables of age, ethnicity, relationship status, and education were also collected from the participants' archived files. All collected data was directly inputted from the archived files into an Excel spreadsheet on a password protected computer that only the researchers had access to. Additionally, all information that was gathered in the study was kept anonymous; each file was assigned a number and no identifying information was obtained from the participants' files.

## Results

### Descriptive Statistics

Descriptive statistics were conducted on PAI antisocial, alcohol use, and drug use subscales and WAIS IV subscales. Frequency analysis rendered that 76.7% of the participants used both drugs and alcohol, 16.7% used only drugs, and 6.7% only drank alcohol. Analysis also revealed, on average, participants scored 77.87 ( $M = 77.87$ ,  $SD = 10.18$ ) on the Antisocial subscale. Furthermore, subscales of the WAIS-IV measuring participants' cognitive abilities revealed that the participants scored on all scales within the average range with the highest on the VCI, and lowest on the PSI (VCI:  $M = 104.20$ ,  $SD = 11.94$ ; PRI:  $M = 101.73$ ,  $SD = 14.86$ ; WMI:  $99.5$ ,  $SD = 11.56$ ; PSI:  $M = 96.17$ ,  $SD = 16.27$ ) (see Table 1).

### Correlations

Scores of the Processing Speed Index were found to be negatively correlated with the scores of the ANT scale of the PAI ( $r = -.45$ ,  $p = .013$ ). The results indicate that as the WAIS-IV scores on the PSI subscale increased the ANT subscale scores decreased. Similarly, ANT scores were also negatively correlated with the age of the participants ( $r = -.425$ ,  $p = .019$ ), as age increased, ANT scores decreased.

### Multiple Regression

A multiple linear regression analysis was conducted to determine if the ANT subscale scores of the PAI can be predicted by the WAIS-IV subtest indexes (VCI, PRI, WMI, and PSI). The regression model was not significant ( $F(4, 25) = 1.98$ ,  $p = .128$ ,  $R^2 = .241$ ). The results indicated that VCI, PRI, WMI were not significant predictors for ANT scores of the PAI. The coefficients are given in the table below (see Table 2). Interestingly, the PSI scores were a significant predictor of the ANT scores. The regression equation is  $Y = -.321(\text{PSI}) + 92.68$ . Standardized beta coefficients indicated that the independent variable, the Processing Speed Index, predicted ANT scores of the PAI ( $B = -.321$ ,  $t = -2.08$ ,  $p = .048$ ).

### One-Way ANOVA

A one-way ANOVA analysis of variance was used to compare whether there is a significant difference between individuals with lower levels of education (high school) as compared to higher levels

of education (some college and above) on means scores for the ANT, VCI, PRI, WMI, and PSI scores. For the ANT scale, one-way ANOVA revealed that there was a significant difference between lower and higher education on mean scores of the ANT scale of the PAI ( $F(1, 28) = 6.156, p = .019$ ). The results indicate that participants who reported their education level as "college and above" on average scored lower on the ANT scale ( $M = 75.52$ ) as compared to those that only graduated from high school ( $M = 85.57$ ). Furthermore, the one-way ANOVA revealed that there was no significant difference between lower and higher education levels on mean scores of the VCI ( $F(1, 28) = 2.017, p = .167, n.s.$ ), PRI ( $F(1, 28) = .395, p = .535, n.s.$ ), WMI ( $F(1, 28) = .371, p = .547, n.s.$ ), and PSI ( $F(1, 28) = .633, p = .433, n.s.$ ) of the WAIS-IV (see Table 3).

## Discussion

The present study analyzed the relationship between the scores of ANT scale, signifying presence of Psychopath, and the scores of the individual subscales of the WAIS-IV. The findings uncovered that individuals who scored higher on the antisocial subscale had lower processing speed scores. The Processing Speed Index of the WAIS-IV measures a person's attention, concentration, cognitive flexibility, ability to mentally process information and self-monitor, as well as additional functions [20]. Available research suggests processing speed might affect a person's judgment and his/her decision-making abilities. In other words, mental functions, such as paying attention to specific information, gathering of relevant information, and encoding information, are often compromised when a person has low processing speed [39,40]. Psychopathic traits coupled with poor processing speeds may lead to issues like emotional instability, need for stimulation, poor behavior control, poor impulse control, and irresponsibility. These difficulties may be directly related to poor processing speeds since individuals cannot perceive and process all the necessary information to regulate their emotions, control their behavior, and use sound judgment [40]. Therefore, the results of the present study indicate that individuals who have processing issues may struggle with their ability to modulate their impulses and ability to make appropriate decisions. Keen processing speed may act as a buffer to problematic or criminal behavior as the person can quickly encode the information by considering all of the social, emotional, and personal consequences of their actions. The ability to process information quickly and accurately is an essential step when rendering decisions and judgments.

Traditionally, Psychopath has been associated with disregard for others; conduct issues, impulsivity, and affective deregulation [41]. According to Hare in addition to the issues with conduct and disregard for rights of others, Psychopath also includes impulsivity, lack of forethought, irritability, and physical aggressiveness without much provocation [42]. Recently, however, researchers began to look at the association between Psychopath and affective

deregulation [43]. Burt and Dunnellon evaluated approximately 500 undergraduate male students who met the threshold for Psychopath in two different trials [43]. Their study found a positive correlation between aggressive behavior, affective deregulation, and negative affectivity. Looney et al. obtained similar results with an adolescent population who exhibited antisocial and psychopathic behaviors [44]. The study included 65 males who were conscripted from a juvenile court ranging in age from 12 to 18 years old. The researchers used an Antisocial Process Screening Device to establish the presence of psychopathic traits and antisocial behaviors in the sample [43,45]. Looney et al. Found that adolescents who exhibit antisocial behaviors and psychopathic traits are unable to respond appropriately to emotional stimuli when compared to their counterparts without psychopathic traits [44].

Considering these findings, patients who have psychopathic traits and lower processing speed may require modified treatment protocols. They might benefit more from treatment plans that are more concrete, easier to understand, and simpler. Psychopath, however, traditionally has been treated through Therapeutic Communities, a treatment modality that is considered ineffective or even risky for this population [46]. Interestingly, if there is a connection between low processing speed and impulsivity, then the commonly used treatment (therapeutic communities) to improve impulse control will not produce desirable long-term outcomes. Similarly, in settings such as prison or substance abuse recovery center, group therapy is a very popular treatment modality. Therefore, the findings of this study might suggest individuals with slower processing speed might not be able to focus and understand the material or do what is expected of them in large groups with various stimuli. Subsequently, inability to follow the group's protocol may lead to treatment attrition. Furthermore, in most cases, impulsive behaviors are treated with medication and in some cases, medications combined with some form of behavioral therapy [47-49]. Regardless if treatment is a medication only regimen or combined with some form of behavioral therapy, it only addresses the impulsive behaviors, not the information processing and encoding issues. Those specific patients, due to their cognitive challenges, might not be good candidates for the standard treatment plans designed for high functioning patients [32]. Generally, engaging in treatment protocol potentially means changing habits, environment, or even eliminating certain people from a patient's life. If a patient is struggling with their decision-making abilities or judgment, it might be difficult for them to see the change as more beneficial or necessary, resulting in attrition or lack of engagement. Those patients might require longer and more intensive treatment rather than standard treatment protocols. A more intensive treatment for this specific population may need to focus on the following: problem solving abilities,

decision making, and impulse and self-regulation control. Gacono found that substance abuse patients who also score high on the PCL-R are less likely to relapse, and more likely to complete their treatment if they are provided with more intense monitoring, structured environments, incentives, and extended treatment time [32]. Furthermore, setting clear limits and consequences would be essential in working with psychopathic clients [32]. In addition, teaching new ways to stay interested and enthused about activities and life has also been found to be successful in preventing relapse [32]. A key characteristic of Psychopath is that many individuals are drawn to risk taking activities [32]. The study highlights that individuals with processing speed challenges may not be disinterested or resistant to treatment, but rather they are unable to understand the goals and objectives of treatment.

The study also revealed that the scores on ANT decreased as years of education increased. Currently, researchers point to multiple explanations as to how education level can correlate with psychopathic traits [50]. Some studies point that socioeconomic status is the determining factor, and when juvenile boys exhibit psychopathic traits combined with unfavorable socioeconomic status, they are more likely to have poor grades in school and drop out of education earlier [51]. Other studies, however, point out that it is not the socioeconomic status that affects the education level in individuals with psychopathic traits, but rather the person's IQ score [50]. The literature on the subject of psychopathic traits and formal education is limited. Available studies suggest that individuals who exhibit psychopathic traits often will also have lower than average IQ scores [52]. Therefore, the results of this study corroborate those findings by suggesting that the individuals with higher education level, indicative of higher IQ level, scored lower on the ANT scale.

The findings that individuals who exhibit psychopathic traits might also have a lower IQ provides sound explanation to why individuals with psychopathic traits exhibit behaviors such as impulsivity, criminality, inappropriate social skills, and substance use disorders. Lower IQ would suggest lower cognitive abilities, subsequently leading to an inability to control impulses and self-monitor, as well as an inability to make appropriate life decisions in terms of exercising good judgment or utilizing available resources, such as substance use treatments [50,53].

### 5.1. Clinical Implications

The results of this study indicate that clinicians should possibly shift their assessment and treatment focus away from the relational deficits associated with Psychopath and target their cognitive limitations. Considering the results of this specific study, it is evident that individuals who exhibit psychopathic traits, and have history of substance use, appear to struggle with processing information, impulse control, and self-control. As this study shows, individuals

with psychopathic tendencies may more likely struggle with slower processing speed. Given this information, therapists and substance abuse counselors could benefit from assessing their patients for presence of psychopathic traits and utilize more simplified and longer treatment protocols. Research shows that effective treatment modalities, for instance CBT, prove successful with patients who are high functioning and without any cognitive restrictions [54]. Thus, the findings from this study suggest, when working with patients who might have lower intellectual and cognitive abilities, interventions that meet their specific needs should be used [54]. Garcon points out, often patients with psychopathic traits terminate treatment early because they are more challenging to engage and keep interested in treatment protocols [32]. This might be due to their cognitive difficulties. Patients with slower processing speed might disengage, if they have a tough time following the treatment plan. Alternatively, patients who are not experiencing cognitive deficiencies, or are functioning above average, might find the treatment protocol not engrossing enough. Therefore, given the correlation between education level and ANT scores, considering a patient's education level, and/or their cognitive abilities, might be an important part of treatment planning when working with patients with psychopathic traits and substance abuse.

Subsequently, appropriate screening for psychopathic traits is very important and beneficial while creating treatment plans. As a clinician, especially in a general population, knowing that a patient has psychopathic tendencies provides a better understanding of the patient's abilities and treatment needs. Patients with psychopathic and antisocial traits will attempt to manipulate and intimidate. They will also require incentives for treatment, structured sessions, and set rules and regulations [32]. Research indicates that high scores on the PCL-R were very strong predictors of attrition rate in psychopathic patients with substance abuse [24]. Even though PCL-R is not widely used or easily accessible, the ANT scale on the PAI could be used as a screener for the presence of psychopathic traits. Furthermore, a thorough clinical interview can also point to a history of weak impulse control abilities, or difficulty with self-control.

To bolster the ability to provide suitable treatment, clinicians could try to differentiate and identify whether the patient suffers from Psychopath or antisocial personality disorder (ASPD). Due to the complexity and controversies surrounding the two conditions regarding their similarities, sufficient assessment is necessary. Hare argues the lack of differentiation between the two conditions might have significant consequences in the legal system, as well as in the community [8]. Hare posits a simple way to differentiate between the two conditions is by looking at the actual symptoms [8]. Enables et al. emphasize that Psychopath has a strong interpersonal and affective component versus ASPD, which is characterized by criminal behavior [56]. The interpersonal and affective



components of Psychopath distinctly underscore that Psychopath is more focused on an individual's personality and relational traits than criminal behaviors. Thus, ASPD is characterized by behaviors that go against social norms or societal rules, yet Psychopath is a pervasive personality structure that involves an inability to understand and process the experiences of others. Evidently, a thorough diagnostic assessment battery is not time and financially efficient. However, there are diagnostic tools that are appropriate for the general population, such as the DSM-5, the LPSP, and the PPI, that might help with differentiating between Psychopath and ASPD. Clinicians could simply refer to the DSM-5 and ASPD criteria provided in the manual to distinguish whether or not their patient has ASPD. Furthermore, in cases when a patient does not meet the DSM-5 criteria for ASPD, yet exhibits characteristics that are congruent with Psychopath, the LPSP or the PPI would be fitting assessments tools to use to establish if Psychopath is present. Once clinicians establish that their patient might exhibit those challenging traits, the treatment plan should incorporate suitable interventions to help them improve their impulse control, self-control, and necessary skills to hopefully prevent or lower the attrition and relapse rates.

In fact, researchers have been creating self-control improvement programs [57]. Those programs use behavioral techniques such as mindfulness, early family interventions, anger management, and problem solving [57]. The most recent meta-analytical study, including over 30 studies, revealed that a self-control program improves self-control and impulse control, and prevents delinquent behavior [57]. Another treatment modality, Dialectical behavior therapy (DBT), created by Dr. Linehan in the 1970s, was used to treat suicidal ideations and rash suicidal behaviors [58]. It was designed to address the overwhelming emotional deregulation that often lead to impulsive behaviors, specifically self-harming behaviors and suicide [58]. Dialectical behavior therapy is most commonly used to treat patients with a borderline personality disorder that is classified as a Cluster B disorder in the DSM-5 [59]. Cluster B personality disorders are characterized by emotional deregulation, inability to self-monitor and erratic behaviors [59,60]. Interestingly, even though Psychopath is not a separate disorder in the DSM-5 (10), the personality characteristics prevalent in Cluster B are a part of Psychopath. Additionally, Antisocial Personality Disorder (ASPD) is classified within Cluster B in the DSM-5 [59]. As previously mentioned, even though ASPD and Psychopath are not one and the same condition, they do share many similar traits and behaviors. Although, much research has shown that individuals with psychopathic traits are treatment resistant, DBT may prove to be helpful for those patients exhibiting poor impulse control, and inability to self-monitor [60].

Researchers have been attempting and studying DBT's potential use with psychopathic patients. Galatea & Rosenfeld created a pilot

study where they attempted to adapt the DBT treatment's plan and interventions to specifically address the needs of psychopathic patients [60]. The study followed the original treatment model of stages (Pretreatment stage, Stage 1, Stage 2, Stage 3, and Stage 4), but adapted it to patients' needs, and their treatment goals. The study also incorporated individual therapy, skills group, consultation teams, and telephone coaching. Additionally, secondary treatment modes were also used, such as substance abuse groups, medical and psychiatric referrals to provide participants with the most cohesive treatment [60]. Overall, the results of the pilot study were positive. The researchers reported that even though there was some participant attrition, participants with impulse control issues and emotional deregulation showed the most improvement using DBT [60].

Application of DBT while working with substance users who exhibit psychopathic traits has additional benefits. The current study points out those patients who exhibit psychopathic traits might also have lower processing abilities, and lower IQ level. When considering these factors and the DBT treatment stages, this modality can be easily adapted to meet patients' needs, mental and cognitive abilities. Lineman explains that the DBT model assesses a patients' severity of disorder and problems they are facing to provide treatment until the issues are under control [61]. Therefore, DBT, when adapted to treat populations with slower processing speed, would allow patients to accomplish treatment goals at their own pace. Furthermore, DBT is focused on improving a patient's motivation to change their behaviors, improve their abilities, and learn new behaviors. More importantly, it is customized to a patient's needs and abilities at the time of the treatment [58]. Research suggests that psychopathic patients also struggle with staying involved in certain tasks and often lose interest, specifically leading to substance use treatment attrition [32]. Therefore, the DBT treatment model may help patients with processing speed challenges to understand follow and stay actively engaged in treatment.

As a final point it is important to consider diversity factors when designing appropriate treatment protocols. While choosing treatment protocols for patients with any type of disorder, or struggles, it is very important to be aware of patient's diversity [62]. This task might be more complex when working with patients who have a challenging diagnosis such as Psychopath. More importantly, these individuals are often not only struggling with personality disorders and substance abuse, but are also incarcerated, which is an additional risk factor that might significantly affect their receptiveness and participation in treatment [63]. While cultural competence for a treating clinician is extremely important, prison culture adds another dimension of complexity while deciding on treatment protocols [64]. The psychopathic population is very challenging to work, but when combined with a correctional setting,

prison culture, and criminal past, their defensiveness to treatment will likely be much greater [63,64]. When considering diversity in conjunction with a criminal setting, social learning should also be considered, and how it might affect treatment. Barton and Barton suggest some individuals are not criminals because they are psychopathic, but they acquired Psychopath-like behaviors as an adaptive way to have their needs met, such as safety, pleasure, or rewards [65]. Additionally, many incarcerated individuals continue to engage in antisocial behaviors as a way to protect themselves while they are in prison. Many prisoners are exposed to a large range of violent behaviors from other prisoners while in custody. Thus, adopting aggressive and threatening behaviors, which often might be labeled as psychopathic behaviors may serve as a way to maintain safety and control while incarcerated. Babiak and Hare posit that adaptive behaviors can be classified as reactive violence [3]. They explain that reactive violence is a usual reaction one might resort to when faced with danger, threat, or unpleasant emotional situations [3]. Babiak and Hare argue reactive violence is different than instrumental violence which psychopathic individuals usually resort to [3]. The authors define instrumental violence as a way psychopaths use to get what they want, when they want it, without any concern for others despite any suffering they might cause. Therefore, while an inmate might engage in behaviors fitting psychopathic patterns, they might not be psychopathic, and might not be responding to treatment as expected. Consequently, when considering treatment protocols with diversity, incorporating criminal risk factors, such as childhood trauma, gang involvement, their status in prison, groups they belong to, as well as their offenses, will be crucial. Ultimately, despite the setting, or population, considering and assessing patients' diversity should be a vital component of choosing treatment protocols.

### Limitations

Although the study produced results that advance the understanding about the cognitive functioning of individuals with psychopathic tendencies, there were also various limitations that need to be addressed. The main limitation was the inability to use the most robust Psychopath assessment available to assess participants. Based on available research, the best tool to assess Psychopath is the PCL-R created by Dr. Hare [26]. Even though the ANT scale of the PAI was created to assess psychopathic characteristics, and it has been found to moderately correlate with the PCL-R results, it has been suggested the PAI to be used as a screening tool rather than diagnostic tool for Psychopath [66]. Therefore, the results even though significant should be considered with caution.

The study also presents a few concerns regarding the sample used in this project and methods of finding appropriate subjects. The concept of Psychopath as mentioned can be difficult to

define and identify with testing instruments. Many individuals who would score high on the ANT scale will be found in criminal settings and not in general population community clinic in Orange County. Therefore, purposive sampling method was used creating a relatively small sample size when compared to available studies performed in forensic settings. Furthermore, to find the needed sample the researcher lowered the threshold for the ANT scale to 65 from 70 and higher. Even though that score is still considered clinically significant and suggests presence of traits such as impulsivity and callousness that can be indicative of Psychopath, it is considered to be on the less severe side [67]. Moreover, the researcher did not separate subjects' gender when analyzing the data. According to research, there have been more studies performed with male psychopathic population than female [32]. With limited research available it is unknown if gender inclusivity could have affected the results of the study. This limitation should be considered in future research.

The researcher used archival data to locate needed subjects for the project. The research sample was chosen based on the PAI scores on the ANT and ALC/DRG scales. The use of archival data prohibited the researchers to follow up with the subjects to inquire about their current substance use. Due to the clinical implications of this study in potentially helping to prevent relapse, more thorough understanding of subjects' present substance use would be more advantageous. The study also lacked ethnic diversity. The sample was collected from one clinic located in Orange County, California. According to the 2010 census, the majority of the Orange County population (72%) identified as Caucasian, which correlated with the ethnic breakdown of the sample size and did not provide a diversified sample. Evidently the study has methodological limitations that might pose questions to the validity of the results. The results, however, correlate with other available studies addressing similar issues and point to weak impulse control abilities. Therefore, there is merit in this study's findings and those implications add to the current literature and could warrant future research.

### Future Research

The present study has numerous limitations, although the findings indicated that there is a correlation between high scores of ANT and low scores on the Processing Speed subtest of the WAIS-IV, as well as ANT scores and years of education. Those implications not only add to existing literature, but also provide direction for future research. Further studies would benefit from addressing some of the limitations in order to improve validity and credibility of their findings. If possible, using the most robust Psychopath tool the PCL-R would be the most valuable improvement. Additionally, separating genders could also be beneficial. Since the field has limited understanding of Psychopath in men, and even lesser

understanding of Psychopath in women, further examination of gender differences is warranted.

Finally, the significance of this study's findings can be potentially beneficial to the criminal justice and forensic settings. Future studies should look at the prison population to see whether similar results will be produced. As mentioned before, not every psychopath is a murderer, and many go in and out of prison system. Therefore, if appropriate treatment can improve inmates' impulse control it could also lower recidivism rates. Additionally, the correlation between ANT scores and level of education could point to psychopaths ageing out of their condition. Supplementary research could also look at longitudinal studies in long term inmates to compare their scores over the years to confirm whether psychopathic traits become less active and severe as psychopaths grow older.

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### Conflict of Interest

None of the authors have a conflict of interest.

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