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Epidemiology, Comorbidity, and Behavioral Genetics of Antisocial Personality Disorder and Psychopathy

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Abstract

Psychopathy is theorized as a disorder of personality and affective deficits while antisocial personality disorder (ASPD) diagnosis is primarily behaviorally based. While ASPD and psychopathy are similar and are highly comorbid with each other, they are not synonymous. ASPD has been well studied in community samples with estimates of its lifetime prevalence ranging from 1-4% of the general population.[4,5] In contrast, psychopathy is almost exclusively investigated within criminal populations so that its prevalence in the general population has been inferred by psychopathic traits rather than disorder (1%). Differences in etiology and comorbidity with each other and other psychiatric disorders of these two disorders are also evident. The current article will briefly review the epidemiology, etiology, and comorbidity of ASPD and psychopathy, focusing predominately on research completed in community and clinical populations. This paper aims to highlight ASPD and psychopathy as related, but distinct disorders.

Introduction

The distinction between the diagnoses of antisocial personality disorder (ASPD) and psychopathy is often misunderstood in the clinical setting. ASPD is a clinical diagnosis included in the Diagnostic and Statistical Manual of Mental Disorders Fifth Edition (DSM-5) and is categorized as “a pervasive pattern of disregard for, and violation of, the rights of others, occurring since age 15”(pg. 659).[1] Psychopathy is also a personality disorder, although not included in the DSM, and is characterized by, impulsivity, shallow affect, superficial charm, callousness, and manipulation, with two main factors—antisocial deviance and affective interpersonal.[2] For ASPD, behavioral traits, which overlap with the antisocial deviance symptoms of psychopathy, are dominant, while for psychopathy, affective and interpersonal traits are paramount.[3] ASPD may be the most well assessed personality disorder diagnosis as it has consistently been included in community and national surveys. Conversely, psychopathy is linked with criminal behavior and is almost exclusively diagnosed in prison settings; research outside of criminal populations is based primarily on psychopathic traits as a proxy for a psychopathy diagnosis.

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While ASPD and psychopathy are similar and are highly comorbid with each other, they are not synonymous, with differences evident at the epidemiological, etiological, and comorbid levels. For this review, we will focus the majority of our attention on community and clinical populations, relying on data from criminal populations only when necessary. Other reviews in this issue will address historical, developmental, and neurobiological differences between ASPD and psychopathy.

Epidemiology

Estimates of the lifetime prevalence of ASPD in the general population range from approximately 1-4%. [4,5] with past 12 month prevalence rates between .2 and 3.3%.[1] These estimates are broad, since a diagnosis of ASPD is predicated on a diagnosis of conduct disorder prior to the age of 15 (Criterion C) which is not always fully assessed. Nevertheless, the requirement of this childhood criterion informs an understanding of ASPD as a persistent personality disorder with roots early in development. Gender also seems to play a role in ASPD, as males are 3 to 5 times more likely to be diagnosed with ASPD than females, with 6% of men and 2% of women meeting DSM-IV criteria for ASPD[5,6] in the general population, which holds as well for clinical samples based on primary care clinics (8% of men v 3% of women).[7] A recent review summarized ASPD rates across a variety of psychiatric settings and assessment procedures, with estimates of ASPD ranging from 1.0 to 18.2%.[8] In a rigorous study in a general psychiatric outpatient clinic using semi-structured assessments to diagnose personality disorder, 3.6% met DSM-IV criteria for ASPD.[8] The highest estimates of ASPD (over 70%) have been reported in clinically ascertained populations of males with substance use disorders .[9]

In contrast to the extensive epidemiologic research in ASPD, the estimated prevalence of psychopathy in the general population is less well characterized. The gold standard diagnostic assessment of psychopathy is the Psychopathy Checklist-Revised (PCL-R).[2] However, this assessment requires both an interview and a review of the individual's history of criminality (readily available in forensic settings but difficult to obtain for a general population sample), and thus it is not commonly used in epidemiologic studies; for these latter studies, in lieu of diagnosis, self-report psychopathy measures such as the Psychopathy Checklist – Screening Version (PCL: SV) obtain psychopathic traits (e.g., impulsivity, callousness, etc.) that fall short of full diagnosis.[10]

In forensic psychiatric samples, psychopathy is prevalent among 3% of patients; [11] however, for reasons described previously, the exact prevalence of psychopathy in the general population remains unknown. Estimates based on psychopathic traits, as reported by Neumann and Hare [12] have indicated that 1.2% of the general population scored in the range indicative of potential psychopathy; a more recent report corroborated this estimate, finding 1% of individuals in a community setting meeting clinical levels of psychopathic traits.[13] Similar to ASPD, males demonstrate higher levels of psychopathic traits relative to females.[12]

In addition to increased prevalence of APSD and psychopathic traits in males, those who are younger and those with lower levels of education are also at higher risk for both diagnoses.[6]

Individuals with a lower intelligence quotient have been found to be at higher risk for ASPD[14] and intelligence has been found to be negatively correlated with psychopathy traits.[12] In terms of the course of these disorders, prevalence rates of both ASPD and psychopathy have been reported to steadily decline with age in criminal cohorts[15] and epidemiological samples.[6] This reduction is posited to be a result of both increased mortality rate associated with antisocial behavior and a change in personality traits over the life span.[16]

Etiology

To disentangle ASPD and Psychopathy at the etiological level, researchers have used behavioral genetic studies to evaluate the heritability of these disorders. Often derived from family and twin data, behavioral genetics modeling allows for estimations of genetic influences on a particular trait. Twin studies, in particular, parse the variance of a given disorder/trait into genetic, shared environment, and non-shared environmental effects. Overall, estimates of the heritability of antisocial behavior (a component of both ASPD and psychopathy) have been equivocal, with one study reporting little [17] and others reporting high (71%) heritability.[18] This heterogeneity in heritability estimates may reflect sample characteristics [e.g., age, gender, nature of the sample (community v clinical) etc.] and methodological inconsistencies (e.g., assessor proficiency, assessment tool, etc.). Recent reviews and meta-analyses have shown evidence of strong genetic effects on antisocial behavior and shared and individual-specific environmental influences.[19,20] Importantly, Rhee and Waldman's 2002 meta-analysis reported both additive and non-additive genetic contributions to antisocial behavior (32% and 9% respectively), along with 16% of the variance explained by shared environment and the remaining 43% explained by individual-specific environmental influences.[19] Since the publication of that meta-analysis, other studies have yielded heritability estimates in a similar range - 38% genetic contribution to the variance in antisocial behavior.[21]

There are very few studies of the heritability of ASP disorder. One of the few studies was conducted by Fu and colleagues [22] using the male-only Vietnam Era Twin Registry sample. They observed that 69% and 31% of the variance in ASPD was attributed to genetic and individual-specific environmental influences respectively, with no evidence for shared environmental influence. These findings are largely consistent with earlier research indicating a moderate correlation between proband and relative ASPD status (r = .43 +/− . 05)[23] suggesting familial aggregation of ASPD . However, family studies do not enable disentangling genetic influences from shared environmental influences.

Investigations into the genetic and environmental contributions underlying psychopathy have relied on self-reports of psychopathic traits as opposed to diagnosis, and have suggested that psychopathic traits have substantial genetic influences. Rhee and Waldman[19] included studies investigating psychopathic traits as an independent construct. Results from the best fitting model indicated that 49% of the variance in self-reported psychopathy was attributable to additive genetic effects and 51% to individual-specific environmental effects with scant evidence for shared environmental influences. More recent genetic investigations have corroborated these findings, in both adult [24-26] and adolescent populations.[27]

Overall, results of these studies reveal that both psychopathic personality traits and ASPD are influenced by additive genetic factors and non-shared environmental factors with no significant contribution of shared environment. These findings differ from those indicating considerable shared environmental contributions to antisocial behavior. One proposed limitation to this body of research is that many heritability studies of psychopathy only assessed the antisocial deviance factor and did not include the affective-interpersonal traits that are central to the psychopathy construct. Inclusion of the affective-interpersonal factor of psychopathy may alter the behavioral genetic findings by revealing shared environment as a significant contributor to psychopathy and distinguishing the heritability of ASPD and psychopathy. Future research is needed to address this possibility.

Comorbidity

ASPD and psychopathy are themselves highly comorbid, and ASPD is highly comorbid with other psychiatric disorders, particularly substance use and mood disorders. Evidence from epidemiological samples indicates that individuals with ASPD are four times more likely to experience a mood disorder, 13 times more likely to also experience a substance use disorder (SUD) and 7 and 9 time more likely to have suicidal ideations and attempt suicide, respectively.[28] Considerably less is known about comorbidity associated with psychopathy, and most of what is known is derived from forensic psychiatric samples.

ASPD and psychopathy comorbidity

As noted earlier, ASPD and psychopathy are overlapping constructs; however, the relationship between ASPD and psychopathy has been consistently shown to be asymmetric, by which is meant that nearly all cases of psychopathy (or PCL score higher than 30) meet criteria for ASPD, whereas only a small proportion of those with ASPD meet criteria for psychopathy.[29] It has been suggested that this asymmetry provides support for the notion that psychopathy is a more severe and violent form of ASPD.[30] Some research into co-occurrence of these disorders supports this hypothesis suggesting psychopathy and ASPD represent disorders at varying extremes on the same continuum.[31] Regardless, the overlapping symptoms are stronger within some factors of psychopathy than others. Psychopathy and ASPD have been shown to be similar on the antisocial/deviance domain, but the affective/interpersonal domain of psychopathy appears to be distinct and is not strongly related to ASPD.[30]

Comorbidity with Substance Use Disorders

Substance use and disorders (SUDs) are the most highly comorbid conditions with ASPD and psychopathy. Those with ASPD are much more likely to use substances and to be diagnosed with SUDs and conversely, those with SUD are more likely to be diagnosed with ASPD. Using data from waves 1 and 2 of the National Epidemiological Survey on Alcohol and Related Conditions (NESARC), a large household survey in the US, Trull and colleagues[5] reported those with ASPD were 7 to 8 times more likely to meet criteria for alcohol dependence, 15 to 17 times more likely to meet criteria for drug dependence, and 5 to 6 times more likely to be nicotine dependent compared to those without ASPD - consistent with estimates reported in other community samples[4]. Recent data indicated that

18.2% of individuals with any lifetime drug use disorder and 9.1% of individuals with lifetime alcohol use disorder also meet criteria for ASPD.[32,33] The presence of ASPD was also found to predict persistent cannabis use disorder (OR = 2.46), alcohol dependence (OR = 3.51), and nicotine dependence (OR = 3.19) over a three year period.[34] Compared to those with SUD without ASPD, individuals with both ASPD and a SUD have more severe SUD symptomatology, poorer treatment outcomes, and more severe levels of drug and alcohol use.[32,33] Additionally, of individuals with ASPD, those with earlier onset conduct disorder experience higher rates of comorbidity.[35]

There is considerably less data on the comorbidity of psychopathy and substance use disorders. In forensic psychiatric samples, psychopathy severity is moderately positively correlated with drug use disorder.[36] Only one study found a significant relationship between psychopathy and alcohol use disorders in a criminal sample.[37] Other research has investigated the prevalence of psychopathy in SUD cohorts. A review by Rutherford, Alterman, and Cacciola[38] found that approximately 12% of individuals with SUD also met criteria for psychopathy, and of these, methadone maintenance patients exhibited substantially greater rates (i.e., 23%).

Research investigating constructs underlying the comorbidity of ASPD and psychopathy with SUDs have reported that SUDs and SUD symptoms are moderately correlated with the antisocial deviance factor (r = .36 - .21) and only weakly associated with the affective and interpersonal factors (r = .19 - −.02) of psychopathy.[12,24,39] The antisocial deviance factor of psychopathy is also highly correlated with ASPD (e.g., lifestyle and antisocial constructs). As such, the strong relationship between antisocial deviance constructs and SUDs may inform not only the relationship between ASPD and SUDs but may also be useful in understanding psychopathy and SUDs comorbidity. Furthermore, the underlying mechanisms of these antisocial deviance constructs may help explain the prominence of antisocial behavior in ASPD, psychopathy, and SUDs. For example, shared genetic liability for SUDs and antisocial behavior has been proposed.[18] Krueger and colleagues[24] reported externalizing and impulsive antisociality traits are highly heritable, moderately genetically correlated (r =.49), and significantly associated with adult antisocial behaviors (r = .38) and SUDs (r = .21-.36). This association holds for behavioral addictions such as pathological gambling which has also been associated with ASPD in community and behavioral genetic studies[40] strengthening the hypothesis that impulsivity and externalizing behaviors are common underpinnings to the etiology of addiction, ASPD, and psychopathy.

Anxiety and Mood Disorders

Similar to findings with SUDs, understanding the comorbidity between ASPD, psychopathy, mood and anxiety disorders can provide clues to underlying mechanisms of these shared symptoms. Symptoms reflecting impulsivity and emotional dysregulation are found in ASPD, psychopathy, anxiety and mood disorders. Interestingly, the relationship between psychopathy and ASPD with mood and anxiety disorders has been a controversial topic as many experts associate ASPD and psychopathy with very low levels of anxiety and depression.[41] In contrast, in the DSM-5 it is noted that those with an ASPD diagnosis may also experience anxiety disorders and/or depressed mood.[1] Large population surveys

investigating mood and anxiety disorder comorbidity with ASPD have found that up to half of the individuals with ASPD may also experience an anxiety disorder in their lifetime, particularly posttraumatic stress disorder and social anxiety disorder (although PTSD is no longer considered an anxiety disorder in DSM-5).[28,42] These individuals with comorbid ASPD and anxiety disorders were found to be at increased risk for major depression, substance dependence, and suicidal ideation and attempt.[28] Although little is known pertaining to the prevalence of mood and anxiety disorders within a psychopathic population outside of criminal cohorts, data suggest that psychopathic traits are inversely related to both anxiety and depression in community, undergraduate, and incarcerated samples.[43] These findings are not without limitations as data utilized were cross-sectional in nature thus precluding determining causation. However, as ASPD and psychopathy are rooted in early life behavioral problems and juvenile delinquency ASPD and possibly psychopathy most likely precede these comorbid diagnoses.

Conclusion

Although APSD and psychopathy are often used interchangeably, this review has illuminated distinctions between these two personality disorders at epidemiological and etiological levels. These diagnoses are highly comorbid, but this relationship seems to be asymmetric pointing to psychopathy as possibly a more severe and violent form of ASPD. As there is a general lack of knowledge in the prevalence of psychopathy in epidemiologic samples, future investigations should attempt to fill this gap. Both ASPD and psychopathic traits have been associated with increased levels of SUDs and mood and anxiety disorders, with some research positing shared underlying symptomatology. Future research investigating shared factors of ASPD, psychopathy, and comorbid conditions may help to illuminate underlying symptoms and improve clinical care for these disorders. Genomic investigation into shared phenotypes may help to address the underlying factors of ASPD and psychopathy.

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