Pathological gambling severity and co-occurring psychiatric disorders in individuals with and without anxiety disorders in a nationally representative sample

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ABSTRACT

While anxiety disorders (ADs) and pathological gambling (PG) frequently co-occur with each other and other Axis I and Axis II disorders, previous studies have not examined the relative influence of ADs on the co-occurrences between PG severity and non-anxiety psychopathologies. The current study used data from the National Epidemiologic Survey on Alcohol and Related Conditions ($N=43,093$) to examine the influence of past-year ADs on the associations between past-year PG severity measures based on DSM-IV criteria for PG and non-anxiety psychiatric disorders. The findings revealed that increased PG severity was associated with Axes I and II psychopathology in both the groups with and without ADs. Significant anxiety-by-gambling-group interactions were also observed, particularly with respect to mood and personality disorders. The interactions indicate a stronger relationship between PG severity and psychopathology in participants without ADs than in those with ADs. Future research should investigate specific factors contributing to the co-occurrence of anxiety, gambling, and other psychiatric disorders and how the co-occurrences might influence clinically relevant phenomena such as treatment selection or course.

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1. Introduction

While most people gamble without developing a gambling problem, nationally representative surveys suggest that about 0.2–2% of adults engage in persistent, recurrent maladaptive gambling behavior that fulfills the Diagnostic and Statistical Manual of Mental Disorders IV-TR criteria for pathological gambling (PG) (American Psychiatric Association, 2000; Petry et al., 2005; Kessler et al., 2008). According to the DSM-IV TR, gambling behaviors are considered pathological if they disrupt 'personal, family, or vocational pursuits' and are not attributable to a Manic Episode. A diagnosis of PG involves meeting at least five inclusionary criteria that include a preoccupation with gambling, multiple failed attempts to control, cut back, or stop gambling, feelings of restlessness or irritability when attempting to cut back or stop gambling, and the loss of a significant relationship, job, or other opportunity because of the gambling (American Psychiatric Association, 2000). An additional 4% of the population has been estimated to experience problem gambling, often operationalized as meeting three or four inclusionary DSM-IV criteria for PG, rather than the five needed for PG (Shaffer et al., 1999; Grant et al., 2009). Both problem gambling and PG have been associated with significant clinical distress and adverse functioning in familial, occupational and financial realms (Slutske et al., 2000; Argo and Black, 2004). Levels of gambling falling below the threshold of problem gambling (e.g., meeting one or two inclusionary criteria (at-risk gamblers) or, amongst those meeting none, more frequent as compared to less frequent or no gambling (low-risk gamblers)) have also been associated with clinically relevant measures, such as co-occurring psychiatric disorders (Grant et al., 2009; Brewer et al., 2010). Given the large number of individuals with low-risk, at-risk, problem and pathological gambling behaviors (Desai and Potenza, 2008), there is a significant public health interest in understanding the clinical correlates of a broad range of gambling behaviors (Korn and Shaffer, 1999; Shaffer and Korn, 2002).

Problem gambling and PG frequently co-occurs with other psychiatric conditions including anxiety disorders (ADs). For example, approximately 40% of outpatients with PG may experience co-occurring ADs (Black and Moyer, 1998). In the National Co-morbidity Survey Replication, it was found that PG is often

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temporally preceded by panic disorder (PD), generalized anxiety disorder (GAD), and phobias; furthermore, 52% of participants with lifetime PG experienced phobias, 21.9% experienced PD, and 16.6% experienced GAD (Kessler et al., 2008). A recent longitudinal study demonstrated that PG is positively associated with the development of incident GAD (Chou and Afifi, 2011).

Similarly, when researchers collapse problem and pathological gamblers into a single diagnostic category (problem/pathological gamblers; PPG), high rates of co-morbidity between PPG and ADs have also been found. In the Epidemiologic Catchment Area study sample, the prevalence of PD, phobias, and GAD was 23.3%, 14.6%, and 7.7%, respectively, among adults with PPG. These findings are largely consistent with data from the National Epidemiologic Survey of Alcohol and Related Conditions (NESARC), which indicated elevated rates of ADs among participants with past-year PPG (Desai and Potenza, 2008) or lifetime PG (Petry et al., 2005).

The co-occurrence of PPG and ADs has clinical relevance. Individuals may be more prone to developing gambling problems in the presence of ADs and other psychopathologies such as substance dependence (El-Guebaly et al., 2006). Co-occurrences between PG and ADs have been used to guide treatment selection (Grant and Potenza, 2006). In general, individuals with co-occurring disorders appear to fare worse in treatment (Potenza, 2007). Together, these findings suggest a clinically relevant relationship between PPG and ADs.

Both PG and ADs co-occur with other psychopathologies, including externalizing disorders (e.g., alcohol dependence and antisocial personality disorder) and internalizing disorders (e.g., depression and dysthymia) (de Graaf et al., 2002; Grant et al., 2004; Potenza et al., 2005; Chan et al., 2008). In the modeling of date from large samples of twins, PG has been found to share genetic contributions with both externalizing disorders (Slutske et al., 2000, 2001) and internalizing disorders (Potenza et al., 2005; Giddens et al., 2011). Externalizing disorders (e.g., alcohol abuse/dependence) have been found to influence the relationships between PPG and a broad range of internalizing and externalizing disorders (Brewer et al., 2010). However, analogous studies investigating how internalizing disorders like ADs influence the relationships between PPG and co-occurring psychopathologies have not been previously reported.

1.1. Research objectives and hypotheses

The current study used data from Wave 1 of the NESARC, a nationally representative sample of US individuals ages 18 and over, to investigate whether the relationship between PG severity (employing multiple gambling severity levels, as had been done previously), and other psychiatric disorders was modified by the presence or absence of ADs. PG severity was operationalized as a four-level categorical variable, rather than a binary diagnostic variable, in light of the evidence reviewed above demonstrating that gambling problems fall on a continuum, and that symptoms not meeting full diagnostic criteria for PG are nevertheless clinically significant. This approach has been used in prior research (Desai and Potenza, 2008; Grant et al., 2009; Brewer et al., 2010). Previously, we found that the prevalence of psychopathology was positively associated with PG severity among persons without nicotine dependence and without alcohol abuse/dependence (Grant et al., 2009; Brewer et al., 2010). In contrast, this "dose-dependent" relationship between PG severity and psychopathology was not consistently observed among participants with nicotine dependence and among those with alcohol abuse/dependence. Furthermore, the magnitude of the association between PG severity and psychopathology was generally lower among participants with substance use disorders compared to those without. These findings suggested that these substance use disorders accounted for some of the risk for psychopathology associated with more severe gambling behaviors or PG. Given these findings, we hypothesized that the magnitude of the association between PG severity and psychopathology would be greater for individuals without ADs, compared to those with ADs. We also hypothesized that ADs would specifically influence the relationship between PG severity and mood disorders given the clustering of mood disorders and ADs within an internalizing group of disorders (Krueger et al., 1998; Krueger, 1999).

2. Method

2.1. Sample

The Wave 1 NESARC sample and sampling methodologies have been described extensively in prior work (Grant et al., 2003, 2004). To summarize, the NESARC data were collected from a nationally representative sample consisting of civilian non-institutionalized participants ages 18 and older. In order to reach sufficient statistical power to examine minority and younger aged groups, there was overrepresentation of African American, Hispanic, and young-adult (aged 18–24 years) individuals. The weights of the sample were adjusted for standard errors due to the over-sampling, the cluster sampling technique and the non-response rate. Of those selected for inclusion and contacted, 43,093 individuals agreed to participate (81.0% response rate); participants were surveyed using DSM-IV-based structured clinical interviews (see below). All respondents gave written consent to participate. As the current study used the publicly accessible de-identified data, it was exempted from further IRB review.

2.2. Measures

The NESARC study administered the Alcohol Use Disorder and Associated Disabilities Interview Schedule-Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, version (AUDADIS-IV), a structured assessment tool, which was administered by trained lay interviewers. This instrument has been reported to have high reliability and validity in identifying psychiatric disorders in community samples (Grant et al., 2003). Based on DSM-IV criteria from AUDADIS-IV algorithms, the NESARC data set contains diagnostic psychiatric variables for the Axis I disorders (major depression, PD, GAD, social phobia, simple phobia, dysthymia, mania, hypomania, alcohol abuse/dependence, drug abuse/dependence, and nicotine dependence) and the Axis II disorders (paranoid, schizoid, antisocial, histrionic, avoidant, dependant, and obsessive-compulsive personality disorders).

The questionnaire allows one to distinguish past-year from lifetime diagnoses. As in prior studies (Desai and Potenza, 2008; Grant et al., 2009; Brewer et al., 2010), we selected past-year measures of Axis I disorders given their lesser susceptibility to recall bias and their clinical relevance with respect to co-occurring disorders. As stated previously, we created four PG severity groups based on approaches from prior work (Desai and Potenza, 2008; Grant et al., 2009; Brewer et al., 2010). The groups were as follows: non-gamblers/low-frequency gamblers (reporting < 5 episodes of gambling in a single year in their lifetime); low-risk gamblers (reporting > 5 episodes of gambling in a single year and no inclusionary criteria for PG in the past year); at-risk gamblers (reporting one or two inclusionary criteria for PG in the past year); and PPG (reporting ≥ 3 inclusionary criteria for PG in the past year). As there was a low frequency of PG ($< 1\%$ of the sample reported ≥ 5 symptoms), the problem and pathological categories were combined, as was done previously (Desai and Potenza, 2008; Grant et al., 2009; Brewer et al., 2010).

We stratified our sample into two groups: those who met criteria for any AD in the past year (diagnosis of PD, GAD, social phobia, or simple phobia) versus those who did not. This approach of grouping similar disorders under a broader diagnostic category has been done in research on substance use disorders (Liu et al., 2009). We did not stratify our sample according to the individual ADs because it would limit our ability to make statistically meaningful comparisons.

2.3. Analysis

We modeled our analyses on the techniques used in previously published studies of Wave 1 NESARC data (Grant et al., 2009; Brewer et al., 2010), where analyses proceeded in several steps. The primary research questions concerned differences in the associations between PG severity and Axis I and Axis II disorders according to AD status. To investigate, we first examined the association between PG status and socio-demographic variables according to AD status, in order to identify those socio-demographic variables that might confound the association between PG severity, AD status, and other psychiatric disorders. Next, we calculated the unadjusted, weighted prevalence of psychiatric disorders according to PG severity, stratified by AD status. Statistical significance was determined by the Wald Chi-Squared test.