# Impulsivity in the general population: A national study

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## ARTICLE INFO

## ABSTRACT

*Objective:* The construct of impulsivity is an important determinant of personality differences, psychiatric disorders, and associated risk-taking behaviors. Most existing knowledge about impulsivity comes from clinical samples. To date, no study has estimated the prevalence of impulsivity and examined its correlates in the general population.
*Method:* We analyzed data from a large national sample of the United States population. Face-to-face surveys of 34 653 adults aged 18 years and older residing in households were conducted during the 2004–2005 period. Diagnoses of mood, anxiety, and drug disorders as well as personality disorders were based on the Alcohol Use Disorder and Associated Disabilities Interview Schedule—DSM-IV Version.
*Results:* Impulsivity was common (17% of the sample), particularly among males and younger individuals, and associated with a broad range of axis I and II disorders, particularly drug dependence, cluster B, dependent and schizotypal personality disorders, bipolar disorder and ADHD. It was associated with behavioral disinhibition, attention deficits, and lack of planning. Individuals with impulsivity were more likely to engage in behaviors that could be dangerous to themselves or others, including driving recklessly, starting fights, shoplifting, perpetrating domestic violence and trying to hurt or kill themselves. They were exposed to higher risk of lifetime trauma and to substantial physical and psychosocial impairment.
*Conclusion:* Given the association of impulsivity with psychiatric disorders and multiple adverse events, there is a need to target impulsivity in prevention and treatment efforts.

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Impulsivity, defined as 'a predisposition toward rapid, unplanned reactions to internal or external stimuli with diminished regard to the negative consequences of these reactions to the impulsive individual or to others' (Chamberlain and Sahakian, 2007), contributes importantly to personality differences and externalizing psychiatric disorders (Moeller et al., 2001), such as substance use disorders (Ersche et al., 2010; Moeller et al., 2002), antisocial personality disorder (Swann et al., 2009b), and borderline personality disorder (American Psychiatric Association, 1994). Impulsivity is also common in emotionally labile individuals, including those with borderline personality or bipolar disorders (Swann et al., 2009a) and associated with self-injurious behaviors including suicide attempts (Oquendo et al., 2004). Because impulsivity is associated with risk-taking behaviors, such as driving violations (Paaver et al., 2006), high-risk sexual behaviors (Black et al., 2009), domestic violence (Shorey et al., 2010), gambling (Slutske et al., 2005), kleptomania (Bayle et al., 2003) and with increased probability of adverse outcomes, such as driving-related injuries (Cherpitel, 1999), increased risk of contracting HIV (Bornovalova et al., 2008), being arrested (Nilsson et al., 2010), and undesired pregnancies (Kovacs et al., 1994), impulsivity represents an important construct contributing to many public health concerns.

Most existing knowledge about impulsivity comes from clinical samples or populations, such as adolescents, who have elevated impulsivity (Sterba et al., 2010; Paus et al., 2008). To date, no study has estimated the prevalence of impulsivity and examined its correlates in the general population, thus leaving an important gap in our understanding. Differences in neurobiology (af Klinteberg

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et al., 1987; Manuck et al., 1999; Ruegg et al., 1997) and cognitive styles and social expectations (Calvete and Cardenoso, 2005) have led to the suggestion that men are typically more impulsive than women. However, findings have been mixed across samples (Gaub and Carlson, 1997; Rinne et al., 2000), leaving open the question of whether the prevalence of impulsivity is different in men and women. Similarly, impulsivity is considered to have developmental aspects (Paulsen and Johnson, 1980; Steinberg, 2010), peaking during adolescence and subsequently decreasing after the development of cognitive control capacities and associated maturation of the prefrontal cortex (Galvan et al., 2006; Gogtay et al., 2004). However, epidemiological studies have not examined whether the prevalence of impulsivity decreases with age. Furthermore, clinical studies have emphasized the association between impulsivity and psychiatric disorders such as alcohol dependence (Rogers et al., 2010), bipolar disorder (Swann et al., 2009a), antisocial (Swann et al., 2009b) and borderline personality disorders (American Psychiatric Association, 1994), pathological gambling (Blanco et al., 1996; Slutske et al., 2005; Vitaro et al., 1997), attention-deficit hyperactivity disorder (ADHD) (American Psychiatric Association, 1994), and schizophrenia (Nolan et al., 2011), but whether those findings extend to individuals in the general population is unknown.

The purpose of this study was to fill these gaps in knowledge drawing on data from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), a large, representative sample of the United States adult population. Based on prior work (af Klinteberg et al., 1987; Balodis et al., 2009; Manuck et al., 1999; Mehrotra et al., 2009; Nilsson et al., 2010; Paulsen and Johnson, 1980; Swann et al., 2009a,b), we hypothesized that: 1) impulsivity would be more prevalent among males and inversely related to age; 2) there would be a strong association between impulsivity and externalizing disorders, such as substance use disorders and antisocial personality disorder; 3) after adjusting for the presence of psychiatric disorders, impulsivity would be associated with behaviors characterized by disinhibition, attentional deficits, and lack of planning, such as problems with gambling or spending too much money, troubles paying attention and quitting jobs without knowing what to do next; and, 4) individuals with impulsivity would experience more adverse events such as greater number of lifetime traumas, more frequent incarceration, higher prevalence of HIV infection, and poorer perceived health.

# 1. Method

## 1.1. Sample

The 2001–2002 NESARC is a survey of a representative sample US adults sponsored by the National Institute on Alcohol Abuse and Alcoholism (Grant et al., 2001). The target population was individuals aged ≥18 years in the civilian non-institutionalized population residing in households and group quarters. The survey included those residing in the continental United States, District of Columbia, Alaska and Hawaii. Face-to-face personal interviews were conducted with 43 093 respondents. The Wave 1 survey response rate was 81%. Blacks, Hispanics, and young adults (ages 18–24 years) were over-sampled. The 2004–2005 Wave 2 (Grant et al., 2007a) is the second wave of the NESARC. Its design involved face-to-face re-interviews with all participants in the Wave 1 interview. Excluding respondents ineligible for the Wave 2 interview (e.g., deceased), the Wave 2 response rate was 86.7%, reflecting 34 653 completed interviews. The cumulative response rate at Wave 2, which was 70.2%, represents the product of the Wave 2 and Wave 1 response rates. The mean interval between Wave 1 and Wave 2 interviews was 36.6 (S.E. = 2.62) months.

Waves 1 and 2 NESARC data were weighted to reflect design characteristics of the NESARC and account for oversampling. Adjustment for non-response across numerous variables, including age, race-ethnicity, sex, region and place of residence, was performed. Wave 2 was also adjusted for and the presence of any lifetime Wave 1 NESARC substance use disorder or other psychiatric disorder was administered at the household and person levels. Weighted data were then adjusted to be representative of the civilian population of the USA on socioeconomic variables including region, age, race-ethnicity and sex based on the 2000 Decennial Census.

All potential NESARC respondents were informed in writing about the nature of the survey, the statistical uses of the survey data, the voluntary aspect of their participation, and the federal laws that rigorously provided for the strict confidentiality of the identifiable survey information. The respondents consenting to participate after receiving this information were interviewed. The research protocol, including informed consent procedures, received full ethical review and approval from the U.S. Census Bureau and the U.S. Office of Management and Budget.

## 1.2. Diagnostic assessment

Sociodemographic measures included age, sex, race/ethnicity, nativity, marital status, education, insurance type, employment status and individual income.

The diagnostic interview was the Alcohol Use Disorder and Associated Disabilities Interview Schedule—DSM-IV Version (AUDADIS-IV (Grant et al., 2001)) Wave 2 version (Grant et al., 2007a), a valid and reliable fully structured diagnostic interview designed for use by professional interviewers who are not clinicians.

In Waves 1 and 2, mood disorders included DSM-IV primary major depressive disorder (MDD), dysthymia, and bipolar I and II disorder. Anxiety disorders included DSM-IV primary panic disorder, social anxiety disorder, specific phobias and generalized anxiety disorder (Williams et al., 2003). AUDADIS-IV methods to diagnose these disorders are described in detail elsewhere (Grant et al., 2005a,b, 2006; Hasin et al., 2005; Neufeld et al., 1999). Consistent with DSM-IV, 'primary' AUDADIS-IV diagnoses excluded disorders that were substance-induced or due to general medical conditions. Diagnoses of MDD also ruled out bereavement.

Diagnoses of attention-deficit/hyperactivity disorder (ADHD) and post-traumatic stress disorder (PTSD) were assessed uniquely in the Wave 2 NESARC. Personality disorders assessed on a lifetime basis at Wave 1 and described in detail elsewhere (Compton et al., 2005; Grant et al., 2004a, 2005c) included avoidant, dependent, obsessive-compulsive, paranoid, schizoid, histrionic and antisocial personality disorders. Borderline, schizotypal and narcissistic personality disorders were measured at Wave 2.

Test–retest reliabilities for AUDADIS-IV mood, anxiety, personality disorders and ADHD diagnoses in the general population and clinical settings were fair to good ($\kappa = 0.40–0.77$) (Canino et al., 1999). Test–retest reliabilities of AUDADIS-IV personality disorders compare favorably with those obtained in patient samples using semi-structured personality interviews (Zimmerman, 1994). Convergent validity was good to excellent for all affective, anxiety and personality disorder diagnoses (Grant et al., 2005a,2005c; Hasin et al., 2005), and selected diagnoses showed good agreement ($\kappa = 0.64–0.68$) with psychiatrist reappraisals (Canino et al., 1999).

Embedded in the borderline personality disorder section was the following question: "Most of the times throughout your life, regardless of the situation or whom you were with, have you often done things impulsively?" All NESARC participants were asked this