Three-Year Follow-Up of Syndromal Antisocial Behavior in Adults: Results From the Wave 2 National Epidemiologic Survey on Alcohol and Related Conditions

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Objective: To present nationally representative findings on total antisocial personality disorder (ASPD) symptoms, major violations of others' rights (MVOR), and violent symptoms over a 3-year follow-up in Wave 2 of the National Epidemiologic Survey on Alcohol and Related Conditions among adults diagnosed at Wave 1 with ASPD versus syndromal adult antisocial behavior without conduct disorder before age 15 years (AABS, not a codable *DSM-IV* disorder).

Method: Face-to-face interviews were conducted with 34,653 respondents aged 18 years and older. Antisocial syndromes and comorbid lifetime substance use, mood, and 6 additional personality disorders were diagnosed at Wave 1 using the Alcohol Use Disorder and Associated Disabilities Interview Schedule–DSM-IV Version (AUDADIS-IV). The Wave 2 AUDADIS-IV assessed antisocial symptoms over follow-up, lifetime attention-deficit/hyperactivity disorder (ADHD) and posttraumatic stress disorder, and borderline, narcissistic, and schizotypal personality disorders. Wave 1 was conducted in 2001–2002 and Wave 2 in 2004–2005 by the National Institute on Alcohol Abuse and Alcoholism.

Results: In unadjusted analyses, respondents with ASPD reported significantly more total, MVOR, and violent symptoms over follow-up than did respondents with AABS. Adjustment for baseline sociodemographics and psychiatric comorbidity attenuated these associations; after further adjustment for parallel antisocial symptom counts from age 15 years to Wave 1, associations with antisocial syndromes disappeared. Independent Wave 1 predictors of persistent antisociality over follow-up included male sex, not being married or cohabiting, low income, high school or less education, lifetime drug use disorders, additional personality disorders, and ADHD.

Conclusions: The distinction between ASPD and AABS holds limited value in predicting short-term course of antisocial symptomatology among adults. However, the prediction of persistent antisociality by psychiatric comorbidity argues for comprehensive diagnostic assessments, treatment of all identified disorders, and investigation of whether treatment of comorbidity might hasten remission of antisociality.

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Antisocial personality disorder (ASPD) affects 3%–5% of US adults[1–3] and is associated with substantial burden on affected individuals, their families, and society, in its own right and because of its high comorbidity with medical illnesses and injuries,[4–15] as well as mood,[1,3,16,17] anxiety,[1,3,16,17] substance use,[1,3,18] and other personality disorders.[19] Individuals with ASPD are high utilizers of medical care[7,20] and are at elevated risk of premature death from both natural and unnatural causes.[10,21] Despite the clinical, public health, and economic significance of ASPD, however, data concerning its course and outcomes remain limited. This paucity of data reflects ASPD's association with increased mortality, as well as the tendencies of affected individuals to be difficult to locate and uncooperative toward researchers,[22] especially if they are attempting to evade creditors, ex-spouses, or law enforcement authorities.

Cross-sectional epidemiologic studies[3,23–25] have found the prevalence of ASPD to peak by age 35 years. Eventual remission is the rule, beginning by the middle of the fifth decade; some evidence[24,25] suggests that remission may occur earlier in women than in men. Longitudinal outcome data consist of a small number of clinical investigations. Robins' pioneering 30-year follow-up of a child guidance clinic cohort ascertained in the 1920s[26] showed that, of 94 cases meeting criteria for sociopathy, 12% had remitted, 27% had improved but not remitted, and the rest were unimproved. The median age for improvement was 35 years, but Robins noted that there was "no age beyond which improvement seemed impossible."[26(p226)] A 5-year follow-up of 33 male and 19 female "untreated psychopaths" seen in a psychiatric outpatient department in the United Kingdom[27] found that about 17% of men and 29% of women alive at follow-up had "settled down." That is, they had stayed in the same job and with the same partner for more than a few months and demonstrated reductions in other symptoms such as trouble with the law, tendency to tell lies,

For Clinical Use

- Antisocial personality disorder (ASPD) is associated with substantial clinical, public health, and economic burden in its own right and because of its substantial comorbidity with medical illnesses, injuries, and other psychiatric disorders.
- ASPD is poorly responsive to currently available therapies but shows high rates of remission starting by the fifth decade. Treatable predictors of persistent antisociality over 3-year follow-up include lifetime drug use disorders, additional personality disorders, and attention-deficit/hyperactivity disorder.
- While clinical benefits of evidence-based treatment of comorbid disorders have been well documented, future research is needed to determine whether these benefits include hastening the desistance of antisociality.

"psychopathic charm," "positive unease in a stable situation," difficulty keeping friends, residential instability, trouble at school, inability to manage money, and unreliability. No clear predictors of "settling down" were identified.[27]

Arboleda-Florez and Holley[28] documented a decline in registered criminal convictions that started around age 27 years in a cohort of 39 forensic psychiatric patients with clinically diagnosed *DSM-III*[29] ASPD. However, the data suggested variations in patterns of decrease over types of crime, and a significant proportion of patients remained criminally active throughout the follow-up period. Correlates of improvement other than age were not identified and trajectories of other antisocial symptoms were not examined. Additional limitations of this study involved the small cohort and the inclusion of only 1 woman, precluding sex-specific analyses.[28]

In a 16- to 45-year follow-up of 71 men with *DSM-III* ASPD admitted to a tertiary care teaching hospital between 1945 and 1970, Black et al[21,22,30] found that antisociality had remitted in 27% and improved in 31%. Respondents reported that improvement was gradual, beginning at a mean (SD) age of 40 (9) years (range, 28–67). Consistent with this finding, the mean (SD) age at last arrest was 39 (12) years (range, 20–62). Remission was predicted by lower symptom severity at index hospitalization, duration of follow-up longer than 25 years, and absence of a current alcohol use disorder at follow-up interview. However, trajectories of antisociality versus alcohol use disorders over the period covered by the assessment were not characterized.[21,22,30]

According to the *DSM-III*, the *DSM-III-R*,[31] and the *DSM-IV*,[32] a diagnosis of ASPD requires both conduct disorder (CD) with onset before age 15 years and a persistent pattern of aggressive, irresponsible, impulsive, and remorseless behaviors thereafter. However, both clinical[33–39] and epidemiologic[40–42] studies have clearly shown that individuals with syndromal antisocial behavior in adulthood frequently do not report enough symptoms to meet criteria for CD before age 15 years (adulthood antisocial behavioral syndrome or AABS, not a codable *DSM-IV* disorder). While individuals with AABS display fewer antisocial symptoms, and in particular fewer violent symptoms, in adulthood than those with ASPD,[38,43,44] the groups differ little on antisocial symptom profiles in adulthood, many forms of psychiatric and general medical comorbidity,[7,8,33,37,38,42–45] and, among addiction treatment clients, substance use histories.[37,38] No longitudinal follow-ups of antisociality among individuals with AABS, nor investigations comparing patterns of antisocial symptomatology over time between individuals with AABS and those with ASPD, have been reported.

Characterization of similarities and differences in longitudinal course between ASPD and AABS may yield implications both for the nosology of antisocial disorders and for prevention and treatment planning. In addition, questions have been raised about the validity of *DSM* criteria for ASPD among women. *DSM* criteria emphasize overt, physically aggressive behaviors more prevalent in men, while giving limited attention to covert behaviors and relational aggression that may be more typical manifestations of antisociality in women.[46–48] Moreover, the relevance of CD onset before age 15 years to antisociality in women has been debated,[37,47,49,50] in part because far fewer women than men manifest the earliest onsets.[51–54] If the diagnostic criteria are biased with respect to sex, then similarities or differences in clinical course between antisocial syndromes in adulthood, and the implications of these characteristics for prevention and treatment planning, may also differ importantly by sex. To date, almost no outcome studies have included sufficient numbers of women to yield meaningful sex-specific results.

Accordingly, this report compares patterns of antisocial behavior between individuals diagnosed at baseline with ASPD and those with AABS over the 3-year prospective follow-up of the Wave 1 National Epidemiologic Survey on Alcohol and Related Conditions (NESARC).[18,55,56] In addition to total antisocial symptom counts, 2 subsets of symptoms are examined: major violations of the rights of others (MVOR), defined as vandalism, firesetting, stealing with and without confrontation of victim, forgery of another's signature, illegal occupation, forcing someone into sex, repeated initiation of fights, swapping blows with

intimates, use of a dangerous weapon, hitting someone and causing injury, harassment or blackmail, hurting another person on purpose, and hurting an animal on purpose, and the smaller group of violent symptoms, defined as bullying, pushing around, or intimidating other people; vandalism; firesetting; robbing, mugging, or snatching someone's purse; forcing someone into sexual activity; repeatedly starting fights; swapping blows with intimates; using a dangerous weapon; hitting someone and causing injury; hurting another person on purpose; and hurting an animal on purpose. To our knowledge, no research has yet examined the validity of these 2 subsets of symptoms as distinct categories of antisocial pathology. Nevertheless, MVOR and violent symptoms are examined separately because these behaviors may carry particularly severe legal, health-related, and economic consequences for perpetrators, victims, and the general public.

We hypothesized that (1) in unadjusted analyses, counts of total, MVOR, and violent symptoms over follow-up would be significantly higher among respondents with ASPD than among those with AABS and (2) after adjustment for potentially confounding baseline sociodemographic and clinical correlates, including comorbid Wave 1 lifetime diagnoses and parallel antisocial symptom counts from age 15 years to Wave 1, the groups would no longer differ on any antisocial outcome. The large sample size, including the subsamples of respondents diagnosed with ASPD and AABS at Wave 1, and high response rate of the Wave 2 NESARC allow for precise tests of these hypotheses between the 2 diagnostic groups of interest, as well as examination of whether patterns of antisocial behavior over follow-up as predicted by baseline diagnosis vary by sex.

METHOD

Sample

The research protocol, including informed consent procedures, was approved in its entirety by the institutional review board of the US Census Bureau and the US Office of Management and Budget. The 2004–2005 Wave 2 NESARC is the second wave longitudinal follow-up of the Wave 1 NESARC, conducted in 2001–2002 by the National Institute on Alcohol Abuse and Alcoholism (NIAAA) and described in detail elsewhere.[57,58] The Wave 1 NESARC was a nationally representative survey of 43,093 respondents aged 18 years and older. The NESARC's target population was the civilian, noninstitutionalized adult population of the United States residing in households and group quarters. Blacks, Hispanics, and young adults aged 18–24 years old were oversampled. The overall response rate at Wave 1 was 81.0%.[2,59]

In Wave 2, face-to-face reinterviews were attempted with all respondents to the Wave 1 interview. Excluding those ineligible for the Wave 2 interview because they were deceased, deported, on active military duty throughout the follow-up period, or mentally or physically impaired, the Wave 2 response rate was 86.7%, reflecting 34,653 completed interviews. The cumulative response rate at Wave 2 was equal to the product of the Wave 2 and Wave 1 response rates, or 70.2%. As in Wave 1, the Wave 2 NESARC data were weighted to reflect design characteristics of the survey and account for oversampling. Adjustment was performed for household- and person-level nonresponse across sociodemographic characteristics and the presence of any lifetime Wave 1 substance use disorder or psychiatric disorder to ensure that the sample approximated the target population, ie, the original sample minus attrition between the 2 waves due to death, institutionalization or incapacitation, deportation or permanent departure from the United States, and being in the military for the full length of the Wave 2 interviewing period.

When Wave 2 respondents were compared with the target population of Wave 2 respondents plus eligible nonrespondents in terms of baseline (Wave 1) sociodemographic and diagnostic measures, there were no significant differences between Wave 2 respondents and the target population with respect to age, race/ethnicity, sex, socioeconomic status, or the presence of any lifetime substance use, mood, anxiety, or personality disorder (each examined separately). Weighted Wave 2 data were then adjusted to be representative of the civilian population on socioeconomic variables including region, age, race/ethnicity, and sex based on the 2000 Decennial Census.

Antisocial Behavioral Syndromes

The diagnostic interview used in the NESARC was the NIAAA Alcohol Use Disorder and Associated Disabilities Interview Schedule–DSM-IV Version (AUDADIS-IV) for Wave 1[60] and Wave 2.[61] Developed to advance measurement of substance use and mental disorders in large-scale surveys, the Wave 1 and Wave 2 versions of the AUDADIS-IV are computerized, fully structured instruments designed for experienced nonclinician interviewers.

Antisocial behavioral syndromes were diagnosed on a lifetime basis at Wave 1. An AUDADIS-IV diagnosis of ASPD required the specified numbers of *DSM-IV* CD symptoms with onset before, and adult antisocial behaviors since, age 15 years. Consistent with *DSM-IV*, at least 1 CD symptom before age 15 years must have caused social, academic, or occupational dysfunction. AABS was operationalized as meeting all criteria for ASPD except CD before age 15 years. At Wave 2, all respondents, whether or not they reported any antisocial symptomatology at Wave 1, were asked 30 questions covering *DSM-IV* adult ASPD symptoms occurring since the Wave 1 interview. These items reflected all antisocial behaviors queried at Wave 1, except for truancy and staying out at night despite parental objections, which are diagnostically relevant for *DSM-IV* CD only if their onsets occur before age 13 years, and running away from home, which was also not deemed relevant to the follow-up assessment of antisociality among

adult respondents. No new symptom items were added at Wave 2. Test-retest reliability of the AUDADIS-IV ASPD diagnosis was good (κ = 0.67) and compares favorably with results obtained using semistructured personality interviews in treated samples of patients.[62] Convergent validity of ASPD was good to excellent.[2,16,18,19,40]

Other Psychiatric Disorders

Lifetime Axis I substance use, mood, and anxiety disorder diagnoses (except for posttraumatic stress disorder [PTSD]) described in this report are based on the Wave 1 interview. Diagnoses of PTSD and attention-deficit/hyperactivity disorder (ADHD) were assessed in Wave 2. By definition, the diagnosis of ADHD requires onset before age 7 years,[63(p92)] which necessarily predates the onset of adult antisocial symptomatology; lifetime diagnoses of ADHD, and lifetime PTSD diagnoses up to Wave 1, were included in the set of covariates for the present study.

Extensive AUDADIS-IV questions covered *DSM-IV* criteria for alcohol and drug-specific abuse and dependence for 10 classes of substances, as well as nicotine dependence. A *DSM-IV* abuse diagnosis required 1 or more of 4 abuse criteria, while a *DSM-IV* dependence diagnosis required 3 or more of 7 dependence criteria, to be met within a single year preceding the Wave 1 interview. The good to excellent (κ = 0.70–0.91) test-retest reliability of AUDADIS-IV substance use disorder diagnoses is documented in clinical and general population samples.[59,64–67] Convergent, discriminant, and construct validity of AUDADIS-IV substance use disorder criteria and diagnoses were good to excellent,[68–72] including in the World Health Organization/National Institutes of Health International Study on Reliability and Validity,[73–78] in which clinical reappraisals documented good validity of *DSM-IV* alcohol and drug use disorder diagnoses (κ = 0.54–0.76).[64,73]

Mood disorders included *DSM-IV* primary major depressive disorder, dysthymia, and bipolar I and II disorders. Anxiety disorders included *DSM-IV* primary panic disorder with and without agoraphobia, social and specific phobias, and generalized anxiety disorder, in addition to PTSD. AUDADIS-IV methods to diagnose these disorders are described in detail elsewhere.[79–85] Consistent with the *DSM-IV*, "primary" AUDADIS-IV diagnoses excluded disorders that were substance induced or due to general medical conditions. Diagnoses of major depressive disorder additionally ruled out bereavement.

In addition to ASPD, personality disorders assessed at Wave 1 and described in detail elsewhere included avoidant, dependent, obsessive-compulsive, paranoid, schizoid, and histrionic personality disorders. Borderline, schizotypal, and narcissistic personality disorders were measured at Wave 2. All personality disorder diagnoses were assessed on a lifetime basis. The diagnosis of personality disorders requires evaluation of long-term patterns of functioning. Accordingly, all NESARC respondents were asked a series of personality disorder symptom questions about how they felt or acted most of the time throughout their lives, regardless of the situation or whom they were with. Respondents were instructed to exclude symptoms occurring only when they were depressed, manic, anxious, drinking heavily, using medicines or drugs, experiencing withdrawal symptoms (defined earlier in the interview), or physically ill.

To receive a personality disorder diagnosis, respondents had to endorse the requisite number of symptom criteria, at least 1 of which must have caused social or occupational impairment. Personality disorder symptom items were similar to those appearing in the Structured Clinical Interview for DSM-IV Personality Disorders,[86] the International Personality Disorder Examination,[87] and the Diagnostic Interview for DSM-IV Personality Disorders.[88]

Test-retest reliabilities for AUDADIS-IV mood, anxiety, personality disorder, and ADHD diagnoses in the general population and clinical settings were fair to good (κ = 0.40–0.77).[58,59,64] Test-retest reliabilities of AUDADIS-IV personality disorders compare favorably with those obtained in patient samples using semistructured personality interviews.[62] Convergent validity was good to excellent for all affective, anxiety, and personality disorder diagnoses,[2,16,18,19,80–85] and selected diagnoses showed good agreement (κ = 0.64–0.68) with psychiatrist reappraisals.[64]

Statistical Analysis

The analysis sample for this report consists of all respondents to both waves of the NESARC who were diagnosed with either ASPD (n = 1,154) or AABS (n = 4,196) at Wave 1. Weighted frequencies and crosstabulations were computed and their significance tested with χ^2 statistics to compare Wave 1 sociodemographic characteristics and lifetime psychiatric comorbidity with mood, anxiety, substance use, and additional personality disorders by antisocial syndrome.

In addition, frequencies and means were obtained for 3 classes of antisocial symptoms endorsed both before and since the Wave 1 interview: (1) total antisocial behaviors, (2) MVOR, and (3) violent symptoms. Because all the symptom counts had highly skewed distributions, they were converted to categorical variables for use in subsequent analyses. To allow assessment of whether associations with baseline antisocial syndrome varied for 1 versus more than 1 symptom over follow-up, trichotomous variables were defined to denote 0, 1, or 2 or more total and MVOR symptoms. Because of the low prevalence of violent behaviors between the 2 interviews, only a dichotomous variable denoting none versus any of these acts could be examined.

Logistic regression models were used to predict total, MVOR, and violent symptoms over the follow-up period by Wave 1 antisocial syndrome.[89] In addition to the single-predictor (unadjusted) analyses, 2 multivariable models were fit for each outcome. Model 1 controlled for sociodemographic characteristics and lifetime psychiatric comorbidity up to Wave 1. Model 2 controlled additionally for the count

Table 1. Wave 1 Demographic and Clinical Characteristics of NESARC Respondents With ASPD Versus AABS

Characteristic	ASPD (n = 1,154)	AABS (n = 4,196)	χ^2 or F (df)	P
Male, % (SE)	73.9 (1.36)	63.9 (0.86)	35.00 (1)	< .0001
Race/ethnicity, % (SE)			11.38 (4)	.0309
White	70.6 (2.09)	75.2 (1.27)		
Black	10.2 (1.12)	11.0 (0.82)		
Native American	5.8 (0.99)	3.5 (0.39)		
Asian/Pacific Islander	1.9 (0.59)	1.4 (0.30)		
Hispanic	11.5 (1.58)	8.8 (0.86)		
Age, % (SE), y			19.47 (3)	.0007
18–29	37.1 (1.83)	28.5 (0.89)		
30–44	35.6 (1.72)	38.4 (0.97)		
45–64	24.2 (1.52)	28.3 (0.78)		
≥ 65	3.1 (0.70)	4.8 (0.38)		
Marital status, % (SE)			12.51 (2)	.0033
Married/cohabiting	52.5 (1.86)	58.0 (0.97)		
Separated/divorced/widowed	15.9 (1.28)	17.5 (0.66)		
Never married	31.6 (1.81)	24.5 (0.86)		
Past-year personal income, % (SE), $			16.41 (3)	.0021
≤ 19,999	48.4 (1.94)	42.1 (1.01)		
20,000–$34,999	25.4 (1.58)	24.2 (0.87)		
35,000–$69,999	20.0 (1.36)	25.4 (0.85)		
≥ 70,000	6.2 (0.88)	8.3 (0.65)		
Education, % (SE)			33.12 (2)	< .0001
High school	23.3 (1.68)	13.1 (0.72)		
High school graduation	31.6 (1.58)	28.4 (0.94)		
Postsecondary	45.1 (1.87)	58.5 (1.14)		
Region of residence, % (SE)			9.72 (3)	.0276
Northeast	14.8 (2.63)	16.0 (2.46)		
Midwest	24.9 (3.26)	26.2 (2.99)		
South	30.3 (3.22)	33.6 (2.87)		
West	29.9 (3.61)	24.3 (3.10)		
Urban residence, % (SE)	78.8 (2.22)	76.9 (1.92)	1.33 (1)	.2532
Any lifetime mood disorder, % (SE)	51.4 (1.82)	38.9 (0.95)	34.91 (1)	< .0001
Any lifetime anxiety disorder, % (SE)	47.6 (1.81)	35.8 (0.93)	33.47 (1)	< .0001
Any lifetime alcohol use disorder, % (SE)	76.5 (1.50)	71.1 (0.94)	9.34 (1)	.0033
Any lifetime drug use disorder, % (SE)	52.9 (2.07)	35.5 (0.94)	48.19 (1)	< .0001
Lifetime nicotine dependence, % (SE)	55.2 (2.05)	41.0 (0.97)	34.04 (1)	< .0001
Lifetime pathological gambling, % (SE)	2.6 (0.60)	1.5 (0.25)	2.84 (1)	.0967
Additional personality disorder, % (SE)	56.3 (1.70)	39.5 (0.98)	60.46 (1)	< .0001
Attention-deficit/hyperactivity disorder, % (SE)	12.3 (1.16)	6.0 (0.51)	21.89 (1)	< .0001
Family history of antisocial behavior, % (SE)	61.4 (1.96)	47.9 (0.98)	32.06 (1)	< .0001
Total antisocial symptoms since age 15 y, mean (SE)	9.7 (0.17)	6.6 (0.05)	355.18 (1,65)	< .0001
Major violations of rights of others since age 15 y, mean (SE)[a]	4.0 (0.09)	2.4 (0.03)	324.10 (1,65)	< .0001
Violent symptoms since age 15 y, mean (SE)[b]	3.1 (0.07)	1.3 (0.02)	598.67 (1,65)	< .0001

[a]Vandalism, firesetting, stealing with or without confrontation of victim, forgery of another's signature, illegal occupation, forcing someone into sex, repeated initiation of fights, swapping blows with intimates, use of a dangerous weapon, hitting someone and causing injury, harassment or blackmail, hurting another person on purpose, and hurting an animal on purpose.

[b]Bullying, pushing around, or intimidating other people; vandalism; firesetting; robbing, mugging, or snatching someone's purse; forcing someone into sex; repeated initiation of fights; swapping blows with intimates; use of a dangerous weapon; hitting someone and causing injury; hurting another person on purpose; and hurting an animal on purpose.

Abbreviations: AABS = adulthood antisocial behavioral syndrome, ASPD = antisocial personality disorder, NESARC = National Epidemiologic Survey on Alcohol and Related Conditions.

of parallel antisocial symptoms (total, MVOR, or violent) occurring between age 15 years and the Wave 1 interview to assess the extent to which behavior during the follow-up represented a reflection of preexisting patterns. Multinomial models were used for total symptoms and MVOR; binary models were used for violent symptoms. Odds ratios (ORs) and 95% confidence intervals (CIs) were estimated, with ORs considered statistically significant at the .05 level when the associated 95% CIs excluded 1.00.

To test whether associations of antisocial syndrome with each outcome differed between men and women, product terms denoting sex by antisocial syndrome interactions were added to the main effects models (unadjusted, Model 1, and Model 2). The α to stay for each interaction term was set at .05. All analyses were conducted using SUDAAN,[90] which uses Taylor series linearization to adjust for design characteristics of complex surveys like the NESARC.

RESULTS

Sociodemographic Characteristics at Wave 1 by Antisocial Syndrome

Baseline sociodemographic characteristics by antisocial syndrome are given in Table 1. Respondents with ASPD

Table 2. Total Antisocial Symptoms, Major Violations of Rights of Others,[a] and Violent Symptoms[b] Over Follow-Up by NESARC Respondents Diagnosed With DSM-IV ASPD or AABS in Wave 1

	Males (n = 3,158)		Females (n = 2,192)		Total Sample (n = 5,350)		*P*	
Characteristic	ASPD (n = 772)	AABS (n = 2,386)	ASPD (n = 382)	AABS (n = 1,810)	ASPD (n = 1,154)	AABS (n = 4,196)	Antisocial Syndrome	Sex by Antisocial Syndrome Interaction
Total antisocial symptoms, % (SE)							< .0001	.0828
0	53.8 (2.26)	61.8 (1.14)	47.5 (3.32)	63.7 (1.41)	52.2 (1.69)	62.5% (0.87)		
1	15.6 (1.77)	18.8 (0.98)	17.8 (2.46)	20.5 (1.32)	16.2 (1.38)	19.4 (0.78)		
≥ 2	30.6 (2.09)	19.4 (0.86)	34.7 (2.86)	15.8 (1.09)	31.7 (1.59)	18.1 (0.65)		
Total antisocial symptoms, mean, (SE)	1.4 (0.11)	0.9 (0.04)	1.6 (0.15)	0.7 (0.05)	1.5 (0.09)	0.8 (0.03)	< .0001	.0957
Major violations of rights of others, % (SE)							< .0001	.1777
0	78.5 (1.78)	85.9 (0.83)	79.8 (2.20)	90.6 (0.99)	78.8 (1.38)	87.6 (0.64)		
1	12.1 (1.47)	9.3 (0.70)	9.7 (1.45)	6.3 (0.76)	11.5 (1.15)	8.2 (0.51)		
≥ 2	9.4 (1.26)	4.9 (0.50)	10.5 (1.88)	3.1 (0.53)	9.7 (1.05)	4.2 (0.37)		
Major violations of rights of others mean (SE)	0.4 (0.05)	0.2 (0.02)	0.4 (0.06)	0.1 (0.02)	0.4 (0.04)	0.2 (0.01)	< .0001	.3015
Violent acts against persons, animals, or property of others, % (SE)							< .0001	.2239
None	87.0 (1.41)	93.6 (0.60)	85.2 (2.05)	94.5 (0.63)	86.5 (1.13)	93.9 (0.44)		
Any	13.0 (1.41)	6.4 (0.60)	14.8 (2.05)	5.5 (0.63)	13.5 (1.13)	6.1 (0.44)		
Violent acts against persons, animals, or property of others, mean (SE)	0.2 (0.03)	0.1 (0.01)	0.3 (0.04)	0.1 (0.01)	0.2 (0.03)	0.1 (0.01)	< .0001	.3382

[a]Vandalism, firesetting, stealing with or without confrontation of victim, forgery of another's signature, illegal occupation, forcing someone into sex, repeated initiation of fights, swapping blows with intimates, use of a dangerous weapon, hitting someone and causing injury, harassment or blackmail, hurting another person on purpose, and hurting an animal on purpose.
[b]Bullying, pushing around, or intimidating other people; vandalism; firesetting; robbing, mugging, or snatching someone's purse; forcing someone into sex; repeated initiation of fights; swapping blows with intimates; use of a dangerous weapon; hitting someone and causing injury; hurting another person on purpose; and hurting an animal on purpose.
Abbreviations: AABS = adulthood antisocial behavioral syndrome, ASPD = antisocial personality disorder, NESARC = National Epidemiologic Survey on Alcohol and Related Conditions.

were significantly more likely to be male and younger and had lower past-year income and educational attainment than those with AABS. Respondents with ASPD were also more likely to be of Native American or Hispanic race or ethnicity and to reside in the West but did not differ from respondents with AABS with respect to urbanicity. Prevalences of all comorbid lifetime disorders except pathological gambling were significantly higher among respondents with ASPD. Family histories of antisocial behavior were also significantly more prevalent, and counts of total antisocial symptoms, MVOR, and violent symptoms since age 15 years were significantly higher, among respondents with ASPD.

Antisocial Symptomatology Over Follow-Up

Total antisocial symptoms. As shown in Table 2, 52.2% of respondents with ASPD and 62.5% of those with AABS reported no antisocial behaviors since Wave 1. Respondents with ASPD engaged in significantly more antisocial acts than did those with AABS. As shown in Table 3, prediction by ASPD versus AABS of 1 antisocial act versus none over follow-up was not significant. ASPD significantly predicted 2 or more antisocial behaviors both in the unadjusted analysis (OR = 2.1, 95% CI = 1.78 to 2.48) and, much more modestly, in Model 1 (OR = 1.3, 95% CI = 1.07 to 1.60). In Model 2, however, the OR for ASPD was no longer significant (OR=1.1, 95% CI = 0.89 to 1.35). No sex by antisocial syndrome interactions were observed. Covariates that independently predicted 1 antisocial symptom over follow-up in Model 2 included age 18–29 or 30–44 years; past-year personal income ≤ $19,999; and diagnoses of any additional personality disorder and ADHD. Male sex, age 18–29 or 30–44 years, marital status other than married or cohabiting, any lifetime drug use disorder, any additional personality disorder, ADHD, and total antisocial symptom count from age 15 years to Wave 1 independently predicted 2 or more antisocial behaviors over the follow-up period.

Major violations of others' rights. As shown in Table 2, 78.8% of respondents with ASPD and 87.6% of respondents with AABS at Wave 1 reported no MVOR during the follow-up period. As was true for total antisocial acts, respondents with ASPD engaged in significantly more of these behaviors than did those with AABS. ASPD significantly predicted 1 MVOR versus none only in the unadjusted analysis (OR = 1.6, 95% CI = 1.21 to 2.02). ASPD significantly predicted 2 or more MVOR in the unadjusted analysis (OR = 2.5, 95% CI = 1.88 to 3.42); in Model 1, this association remained significant but was much attenuated (OR = 1.4, 95% CI = 1.02 to 2.04), whereas in Model 2,

Table 3. Odds Ratios (95% CIs) for Total Antisocial Symptoms Over Follow-Up Among NESARC Respondents With ASPD (n = 1,154) and AABS (n = 4,196)

	One vs None			≥ 2 vs None		
Wave 1 Characteristic	Crude[a]	Adjusted, Model 1[b]	Adjusted, Model 2[c]	Crude[a]	Adjusted, Model 1[b]	Adjusted, Model 2[c]
ASPD (vs AABS)	1.0 (0.79 to 1.27)	0.9 (0.67 to 1.10)	0.8 (0.65 to 1.09)	2.1 (1.78 to 2.48)	1.3 (1.07 to 1.60)	1.1 (0.89 to 1.35)
Male sex (vs female)	0.9 (0.74 to 1.13)	1.3 (0.97 to 1.62)	1.2 (0.97 to 1.60)	1.2 (0.99 to 1.42)	1.8 (1.47 to 2.22)	1.7 (1.39 to 2.10)
Race/ethnicity						
White	1.0 (referent)	1.0 (referent)	1.0 (referent)	1.0 (referent)	1.0 (referent)	1.0 (referent)
Black	1.1 (0.88 to 1.40)	0.9 (0.73 to 1.21)	0.9 (0.72 to 1.21)	1.5 (1.23 to 1.90)	1.3 (0.98 to 1.64)	1.2 (0.93 to 1.56)
Native American	1.1 (0.62 to 1.82)	1.0 (0.58 to 1.72)	1.0 (0.58 to 1.71)	1.2 (0.80 to 1.85)	1.0 (0.61 to 1.55)	1.0 (0.62 to 1.57)
Asian/Pacific Islander	0.8 (0.32 to 2.07)	0.8 (0.31 to 1.81)	0.8 (0.31 to 1.81)	1.5 (0.72 to 3.27)	1.2 (0.61 to 2.42)	1.3 (0.64 to 2.47)
Hispanic	1.2 (0.89 to 1.63)	1.0 (0.71 to 1.40)	1.0 (0.71 to 1.40)	1.1 (0.87 to 1.49)	0.8 (0.59 to 1.17)	0.8 (0.57 to 1.16)
Age, y						
18–29	3.2 (1.99 to 5.02)	2.8 (1.66 to 4.70)	2.8 (1.65 to 4.65)	6.7 (4.01 to 11.12)	4.3 (2.31 to 8.01)	4.0 (2.15 to 7.50)
30–44	1.9 (1.17 to 2.94)	2.0 (1.22 to 3.33)	2.0 (1.22 to 3.30)	2.4 (1.43 to 4.13)	2.3 (1.27 to 4.28)	2.2 (1.18 to 3.99)
45–64	1.1 (0.70 to 1.85)	1.2 (0.71 to 1.97)	1.2 (0.70 to 1.95)	1.2 (0.69 to 2.14)	1.0 (0.54 to 1.95)	1.0 (0.50 to 1.83)
≥ 65	1.0 (referent)	1.0 (referent)	1.0 (referent)	1.0 (referent)	1.0 (referent)	1.0 (referent)
Marital status						
Married/cohabiting	1.0 (referent)	1.0 (referent)	1.0 (referent)	1.0 (referent)	1.0 (referent)	1.0 (referent)
Separated/divorced/ widowed	1.1 (0.90 to 1.37)	1.2 (0.94 to 1.50)	1.2 (0.93 to 1.49)	1.9 (1.48 to 2.33)	2.2 (1.68 to 2.75)	2.1 (1.63 to 2.71)
Never married	1.9 (1.55 to 2.33)	1.2 (0.96 to 1.56)	1.2 (0.96 to 1.56)	4.0 (3.29 to 4.93)	2.0 (1.60 to 2.57)	2.1 (1.63 to 2.61)
Past-year personal income, $						
≤ 19,999	2.3 (1.55 to 3.51)	1.8 (1.13 to 2.74)	1.8 (1.13 to 2.73)	3.7 (2.46 to 5.42)	1.6 (1.06 to 2.49)	1.5 (0.98 to 2.37)
20,000–34,999	1.6 (1.07 to 2.49)	1.3 (0.85 to 2.03)	1.3 (0.84 to 2.02)	1.7 (1.10 to 2.47)	0.9 (0.59 to 1.36)	0.9 (0.56 to 1.31)
35,000–65,999	1.2 (0.77 to 1.84)	1.1 (0.71 to 1.66)	1.1 (0.71 to 1.66)	1.1 (0.72 to 1.60)	0.8 (0.54 to 1.25)	0.8 (0.53 to 1.23)
≥ 70,000	1.0 (referent)	1.0 (referent)	1.0 (referent)	1.0 (referent)	1.0 (referent)	1.0 (referent)
Education						
High school	1.2 (0.94 to 1.59)	1.0 (0.74 to 1.31)	1.0 (0.73 to 1.30)	2.0 (1.57 to 2.59)	1.2 (0.92 to 1.66)	1.2 (0.85 to 1.58)
High school graduation	1.1 (0.88 to 1.31)	1.0 (0.78 to 1.17)	1.0 (0.77 to 1.17)	1.6 (1.30 to 1.92)	1.3 (1.00 to 1.56)	1.2 (0.97 to 1.52)
Postsecondary	1.0 (referent)	1.0 (referent)	1.0 (referent)	1.0 (referent)	1.0 (referent)	1.0 (referent)
Region of residence						
Northeast	1.4 (1.00 to 1.86)	1.3 (0.95 to 1.79)	1.3 (0.96 to 1.79)	1.0 (0.74 to 1.28)	0.9 (0.64 to 1.24)	0.9 (0.66 to 1.27)
Midwest	1.2 (0.94 to 1.50)	1.1 (0.87 to 1.46)	1.1 (0.88 to 1.47)	1.2 (0.91 to 1.47)	1.1 (0.84 to 1.49)	1.1 (0.86 to 1.52)
South	1.2 (0.94 to 1.56)	1.1 (0.86 to 1.45)	1.1 (0.86 to 1.46)	1.1 (0.90 to 1.44)	1.1 (0.80 to 1.42)	1.1 (0.82 to 1.45)
West	1.0 (referent)	1.0 (referent)	1.0 (referent)	1.0 (referent)	1.0 (referent)	1.0 (referent)
Urban residence (vs rural)	0.9 (0.71 to 1.10)	0.9 (0.70 to 1.10)	0.9 (0.69 to 1.10)	1.0 (0.88 to 1.23)	1.0 (0.83 to 1.29)	1.0 (0.82 to 1.28)
Any lifetime mood disorder	1.3 (1.06 to 1.52)	1.1 (0.88 to 1.32)	1.1 (0.88 to 1.31)	1.5 (1.27 to 1.73)	1.0 (0.79 to 1.14)	0.9 (0.75 to 1.09)
Any lifetime anxiety disorder	1.1 (0.87 to 1.28)	1.0 (0.82 to 1.25)	1.0 (0.82 to 1.25)	1.2 (0.95 to 1.39)	1.0 (0.83 to 1.28)	1.0 (0.81 to 1.26)
Any lifetime alcohol use disorder	0.9 (0.69 to 1.04)	0.9 (0.76 to 1.18)	0.9 (0.75 to 1.17)	1.0 (0.84 to 1.21)	1.0 (0.82 to 1.24)	0.9 (0.75 to 1.15)
Any lifetime drug use disorder	1.0 (0.84 to 1.22)	0.9 (0.76 to 1.12)	0.9 (0.74 to 1.11)	2.0 (1.65 to 2.30)	1.5 (1.24 to 1.82)	1.3 (1.07 to 1.58)
Lifetime nicotine dependence	1.1 (0.89 to 1.25)	1.0 (0.85 to 1.24)	1.0 (0.84 to 1.23)	1.6 (1.32 to 1.81)	1.3 (1.05 to 1.52)	1.2 (0.99 to 1.45)
Lifetime pathological gambling	1.8 (0.89 to 3.68)	1.8 (0.79 to 4.25)	1.8 (0.77 to 4.25)	2.0 (1.07 to 3.63)	1.4 (0.55 to 3.59)	1.2 (0.45 to 3.14)
Additional personality disorder	1.6 (1.33 to 1.93)	1.5 (1.22 to 1.81)	1.5 (1.21 to 1.79)	2.9 (2.43 to 3.47)	2.3 (1.90 to 2.80)	2.2 (1.79 to 2.64)
Attention-deficit/hyperactivity disorder	2.0 (1.36 to 2.93)	1.7 (1.15 to 2.44)	1.7 (1.15 to 2.43)	4.5 (3.30 to 6.17)	3.1 (2.26 to 4.24)	2.9 (2.12 to 3.99)
Family history of antisocial behavior	1.1 (0.95 to 1.36)	1.0 (0.85 to 1.23)	1.0 (0.84 to 1.22)	1.4 (1.17 to 1.69)	1.1 (0.91 to 1.36)	1.1 (0.86 to 1.29)
Total antisocial symptoms since age 15 y, per symptom	1.0 (1.00 to 1.06)	NA	1.0 (0.98 to 1.04)	1.2 (1.13 to 1.19)	NA	1.1 (1.05 to 1.11)

[a]Based on single-predictor multinomial logistic regression models.
[b]Includes all covariates in the table *except* total antisocial symptom count since age 15 years at Wave 1.
[c]Includes total antisocial symptom count since age 15 years at Wave 1 *plus* all other covariates.
Abbreviations: AABS = adulthood antisocial behavioral syndrome, ASPD = antisocial personality disorder, NA = not applicable, NESARC = National Epidemiologic Survey on Alcohol and Related Conditions.

no association remained (OR = 1.0, 95% CI = 0.72 to 1.51). Again, no sex by antisocial syndrome interactions were observed.

Covariates that independently predicted 1 MVOR versus none were male sex (OR = 1.7, 95% CI = 1.30 to 2.29); separated, divorced, or widowed marital status (OR = 1.5, 95% CI = 1.12 to 2.10); urban residence (OR = 1.5, 95% CI = 1.05 to 2.05); any lifetime drug use disorder (OR = 1.4, 95% CI = 1.08 to 1.86); any additional personality disorder (OR = 1.8, 95% CI = 1.32 to 2.33); and total MVOR from age 15 years to Wave 1 (OR per symptom = 1.1, 95% CI = 1.05 to 1.17). Hispanic versus white race or ethnicity predicted reduced likelihood of 1 MVOR (OR = 0.5, 95% CI = 0.28 to 0.77).

Independent predictors of 2 or more MVOR over follow-up were male sex (OR = 1.9, 95% CI = 1.29 to 2.74); marital status other than married or cohabiting (separated, divorced, or widowed: OR = 1.9, 95% CI = 1.21 to 3.10; never married: OR = 2.7, 95% CI = 1.78 to 4.10); past-year personal income ≤ $19,999 (OR = 3.7, 95% CI = 1.05 to 12.96); any additional personality disorder (OR = 3.1, 95% CI = 2.15 to 4.44); ADHD (OR = 1.7, 95% CI = 1.13 to 2.68); family history of antisocial behavior (OR = 1.5, 95% CI = 1.05 to 2.12); and total MVOR from age 15 years to Wave 1 (OR per symptom = 1.2, 95% CI = 1.16 to 1.32).

Violent symptoms. As shown in Table 2, while 86.5% of respondents with ASPD and 93.9% of respondents with AABS reported no violent symptoms over follow-up, those with ASPD were approximately twice as likely to report any, and reported approximately twice as many, violent acts as those with AABS. Wave 1 ASPD significantly predicted at least 1 violent act between Waves 1 and 2 in both the unadjusted analysis (OR = 2.4, 95% CI = 1.87 to 3.05) and, to a lesser extent, Model 1 (OR = 1.5, 95% CI = 1.16 to 1.97).

In Model 2, however, the OR for ASPD was no longer significant (OR = 1.3, 95% CI = 0.94 to 1.65). Once again, no sex by antisocial syndrome interactions were found. Male sex (OR = 1.4, 95% CI = 1.05 to 1.96); non-Hispanic black race or ethnicity (OR = 1.5, 95% CI = 1.04 to 2.04); marital status of separated, divorced, or widowed (OR = 1.6, 95% CI = 1.06 to 2.32) or never married (OR = 1.8, 95% CI = 1.28 to 2.53); high school graduation (OR = 1.4, 95% CI = 1.03 to 1.89) or less (OR = 1.7, 95% CI = 1.22 to 2.49) education; any additional personality disorder (OR = 2.4, 95% CI = 1.79 to 3.32); ADHD (OR = 2.0, 95% CI = 1.35 to 3.01); and total violent symptoms from age 15 years to Wave 1 (OR per symptom = 1.2, 95% CI = 1.13 to 1.32) significantly predicted 1 or more violent symptoms over follow-up in the fully adjusted analysis.

DISCUSSION

This article presents the first nationally representative data on the longitudinal course of antisocial behavioral syndromes among general population adults. Over 3 years of follow-up, the majority of respondents with baseline ASPD or AABS reported no *DSM-IV* antisocial symptoms. Nevertheless, consistent with study hypotheses, respondents with ASPD reported significantly more total, MVOR, and violent behaviors than those with AABS in unadjusted analyses. After adjustment for sociodemographic characteristics and psychiatric comorbidity, these differences were considerably attenuated; with further control for parallel symptom counts from age 15 years to the Wave 1 interview, group differences were no longer significant. Associations of antisocial syndrome with single versus multiple total symptoms and MVOR did not differ significantly. Patterns of results did not differ between men and women.

These results are compatible with evidence from previous cross-sectional epidemiologic surveys[3,23–25] and clinical follow-up studies[22,27,28,91] indicating high rates of desistance from antisocial behavior among respondents with ASPD. Moreover, they extend findings from previous cross-sectional studies that compared the clinical characteristics of ASPD versus AABS[33–42] by showing only small differences in antisocial behavior outcomes between the 2 groups after adjustment for relevant sociodemographic and diagnostic covariates.

That differences between the 2 groups essentially disappeared after further adjustment for symptomatology from age 15 years to Wave 1, which was significantly greater among respondents with ASPD, suggests that the findings from unadjusted analyses of more antisocial behavior over follow-up among respondents with ASPD may simply reflect a general propensity to continue their greater lifetime symptomatic versatility. The extent to which this propensity reflects greater opportunity among respondents with ASPD to develop their antisocial repertoires due to earlier onsets, versus other underlying mechanisms, warrants further investigation, optimally in cohorts studied prospectively beginning in childhood. Nevertheless, our results, taken together, add to the growing body of evidence suggesting that differences in clinical severity and course between ASPD and AABS are ones of relatively modest degree rather than kind. As such, they give further indication that the *DSM* concept of ASPD warrants modification, either to eliminate the requirement of CD onset before age 15 years, or to add a separate diagnostic category for AABS.

While onset of syndromal antisociality before (ASPD) versus since (AABS) age 15 years did not independently predict antisocial behavior over follow-up, several sociodemographic and diagnostic characteristics of antisocial respondents did. Consistent with previous cross-sectional results[24] and the well-documented male excess of overt aggression including behavior symptomatic of CD and ASPD,[51] men were more likely than women to persist in antisocial symptomatology. To the extent that antisocial behavioral syndromes may reflect failure to learn from negative experiences,[92] and that resolution of antisocial syndromes also may reflect delayed social learning, women may acquire such learning earlier than men. Some support for this interpretation may be suggested by the greater prevalences among men and boys of deficits or delays in development of executive function, including those manifest in ADHD, and verbal learning and reasoning,[51,93] which could impede the acquisition of self-control and problem-solving skills.

Other sociodemographic variables that significantly predicted antisocial behavioral outcomes included Wave 1 marital status other than married or cohabiting and, less consistently, Wave 1 past-year personal income ≤ $19,999. Not being married or living as married may have involved the absence of an opportunity cost of further misdeeds to the viability of a valued, committed relationship. Alternatively, it may have reflected the failure of the target behavior to improve enough to allow a committed relationship to

develop. Low income could have likewise reflected a life course in which antisociality impeded attempts to climb the socioeconomic ladder. This in turn may have led to continued engagement in antisocial behavior as a survival strategy or meant that any cost to affected individuals was insufficient to deter further symptomatic acts.

The prediction by young age of total symptoms is consistent with previously reported findings.[3,22,24–26,28,30,91] However, the lack of prediction of MVOR and violent behavior appears to be at variance with the report by Black et al[22] of desistance of arrests, which may be most likely to involve MVOR or violence, at a mean age of 39 years. Differences in sample ascertainment and composition, assessment methodology, and diagnostic criteria may explain these discrepant findings. The relatively low prevalence among antisocial NESARC respondents of MVOR and violent behavior over follow-up may also have limited power to detect modest associations with age as significant.

Diagnostic variables that independently predicted persistence of antisociality over follow-up included any additional personality disorder, lifetime ADHD, and, less consistently, any lifetime drug use disorder. Comorbid personality disorder diagnoses have been identified as adverse prognostic factors in mood, anxiety, and substance use disorders as well as borderline personality disorder.[94–100] To our knowledge, however, this is the first study to identify personality disorder comorbidity as an adverse prognostic factor in antisocial syndromes.

Previous studies in both children and adults have found comorbidity of CD with ADHD to be associated with earlier onset, greater chronicity, more polysymptomatic presentation, and poorer outcomes of CD in both males and females.[101–103] Our findings that lifetime ADHD independently predicted total, MVOR, and violent symptoms over follow-up thus appear to extend the previous results to ASPD and AABS in adults. The adverse prognostic impact of ADHD may reflect higher loadings for externalizing psychopathology.[104,105] It could also more specifically reflect clinical characteristics such as greater impulsivity or more severe deficits in self-regulation among respondents comorbid for antisocial syndromes plus ADHD.[102,106]

That lifetime drug use disorders were associated with total antisocial symptoms and MVOR over follow-up extends to antisociality in adulthood previous work[107] identifying problematic substance involvement as an impediment to desistance from antisocial behavior among adolescents. Our finding also appears broadly compatible with the report by Black et al[91] indicating that men with ASPD plus current alcohol use disorders at 16- to 45-year follow-up were significantly less likely to have been in remission from ASPD than antisocial men without current alcohol use disorders.

A remaining question, however, was whether any lifetime history was the most relevant predictor or whether a current (past-year) drug use disorder diagnosis at Wave 1, being temporally closer to the follow-up period of interest, would be more informative. To address this question, we conducted ancillary logistic regression analyses in which Wave 1 lifetime diagnostic covariates were replaced with the parallel Wave 1 past-year variables. Because ADHD and PTSD were assessed over respondents' lifetimes at Wave 2, and diagnostic variables were coded only for whether the disorders were active at some point prior to the Wave 1 interview (not specifically for the year preceding that interview), these diagnoses could not be included in the ancillary analyses. Therefore, we also refit the lifetime models with these 2 diagnoses excluded and observed that the parameter estimates for antisocial syndrome, sociodemographic variables, and other lifetime psychiatric comorbidity remained essentially identical with ADHD and PTSD omitted.

In the fully adjusted analyses with past-year diagnostic covariates, ORs for sociodemographic and most diagnostic variables did not change from those observed in the fully adjusted models including lifetime covariates. For any drug use disorder, the OR (95% CI) associated with 2 or more total antisocial symptoms went from 1.3 (1.07 to 1.58) to 1.6 (1.18 to 2.21). For 2 or more MVOR, the OR increased from 1.3 (0.94 to 1.81) to 1.9 (1.20 to 2.96). Similar changes in ORs were observed for 1 MVOR over follow-up. Also, whereas Wave 1 lifetime alcohol use disorders did not significantly predict antisocial symptoms over follow-up, Wave 1 past-year alcohol use disorders did predict total symptoms and MVOR, with changes in ORs similar to those from lifetime to past-year time frames for drug use disorders. Taken together, these results do not suggest clinically important differences in prediction of antisocial outcomes by lifetime versus past-year substance use disorder comorbidity.

Limitations of the study include the relatively short follow-up period. The possibility that antisocial activity will re-emerge, particularly among respondents identified as being at elevated risk for persistence such as men and those younger than 45 years of age, cannot be ruled out. In addition, respondents were not asked at Wave 1 whether and, if so, when they had desisted from symptomatic behaviors. Thus, some respondents were probably in long-established remissions by Wave 1. Whether individuals in each diagnostic group with long-term, stable remissions versus recent desistance resemble or differ from one another cannot be determined from the available data.

Implications

In addition to findings from this and other investigations of ASPD, increasing evidence suggests high rates of symptom desistance in other personality disorders, particularly borderline[108–111] and narcissistic.[112,113] Conversely, some evidence suggests that other personality disorders, such as schizotypal, may be more stable over time.[114–116] Taken together, these results suggest heterogeneity in this domain among *DSM-IV* personality disorders, with some, particularly in Cluster B, not manifesting the defining characteristic of life-course persistence. Personality disorders

characterized by high rates of remission may be more appropriately included on Axis I. Nevertheless, even when the defining symptoms have resolved, individuals who have been diagnosed with these disorders may remain highly impaired in ways plausibly traceable to their past symptomatic behavior,[22,30,108–111] raising the question of whether symptom desistance is sufficient to define true resolution of, or recovery from, their disorders.

The answer to this question may be disorder specific; current prevalence of symptoms, which may or may not be at syndromal levels, and of residual impairment after resolution of symptoms, may need to be distinguished from prevalence of personality disorders as assessed over the lifespan. Along these lines, relevant research questions yet to be addressed include (1) the diagnostic status, if any, most appropriate to continuing impairment among individuals whose personality disorder symptoms have long since resolved; (2) which personality disorders, if any, are appropriately moved off of Axis II on the basis of substantial rates of resolution; and (3) how best to categorize "relocated" disorders on Axis I.

While our findings indicate that most antisocial adults desist from symptomatic behavior, they also indicate considerable persistence of this behavior in the short term. The high burden on affected individuals, their families, and society thus argues forcefully for the expansion of prevention and treatment options for antisocial syndromes over the life course. While several prevention and treatment approaches have demonstrated effectiveness against CD in children and adolescents,[117–123] these tend to be resource intensive, and many require high levels of participation by targeted youth and their families, making them difficult to implement in some "real-world" settings.

The poor response of ASPD to most currently available treatments has been well documented[124]; whether AABS would respond similarly or differently remains unknown. As noted previously, increasing evidence of the phenomenologic similarity between ASPD and AABS, including similar symptom profiles from age 15 years into adulthood as well as longitudinal outcome data, argues for revision of the nomenclature to make a place for AABS, either by removal of the requirement of CD onset before age 15 years from the ASPD criteria or by creation of a separate category for AABS. Findings of similarities in intervention outcomes between the 2 syndromes would support the former option, whereas clinically important differences between them would support the latter.

Consistent with the framework articulated by Robins and Guze,[125] family studies comparing pedigrees of probands in each classification, and examination of suitable biologic markers as they become available, will also be critical to maximizing the validity of future revisions of the classifications of antisocial syndromes.

That psychiatric comorbidity, including drug use disorders, additional personality disorders, and ADHD, predicted persistence of antisocial behavior provides additional evidence for the importance of comprehensive diagnostic assessments in both mental health and addiction treatment settings, regardless of the presenting complaint. In contrast to the status of treatment of antisocial syndromes in adulthood, numerous evidence-based interventions are now available for alcohol and drug use disorders,[126] ADHD,[127–129] and, increasingly, borderline, schizotypal, avoidant, and obsessive-compulsive personality disorders.[130,131] Treatment of drug use disorders has been clearly shown to decrease crime.[132] However, outcomes of addiction treatments in other domains of antisocial symptomatology have not, to our knowledge, been assessed within a *DSM*-relevant framework. Similarly, while clinical benefits of treatment of ADHD and comorbid personality disorders have been clearly documented,[127–129,133,134] the potential contributions of these treatments to desistance of antisociality also warrant investigation.

Approaches to hastening resolution of antisocial behavior should be evaluated both within the total population of antisocial individuals and in subgroups among which there may be important variations in outcomes. In addition to those defined by presence of ASPD versus AABS, potentially relevant subgroups may reflect affected individuals' sociodemographic characteristics, contextual factors (eg, community socioeconomic characteristics), and psychiatric comorbidity. Because many individuals with ASPD or AABS will have clinically significant problems documented in multiple domains, it will be important in future research to investigate approaches to prioritization and sequencing of attention to each problem area.

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