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Publication Date

2020-12-01

DOI

10.1016/j.drugalcdep.2020.108274

Peer reviewed

Characteristics associated with denial of problem drinking among two generations of individuals with alcohol use disorders

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ARTICLE INFO

Keywords:

Alcohol
Alcohol use disorders
Denial
Cross generations
Correlates

ABSTRACT

Background: Denial of an overarching alcohol problem despite endorsement of specific alcohol-related difficulties may be central to development and continuation of alcohol use disorders (AUDs). However, there is limited information about which characteristics of drinkers and which drinking problems relate most closely to that denial.

Methods: Using data from two generations of the San Diego Prospective Study (SDPS), we compared AUD subjects who considered themselves non-problematic drinkers (Group 1) with those with AUDs who acknowledged a general alcohol problem (Group 2). Comparisons included demography, alcohol-related patterns and problems, drug use, as well as impulsivity and sensation seeking. Variables were first evaluated as univariate characteristics after which significant group differences were entered in logistic regression analyses.

Results: Sixty-seven percent of 94 AUD probands and 82 % of 176 AUD offspring reported themselves as light or moderate social drinkers despite averages of up to 12 maximum drinks per occasion and four DSM problems. Regression analyses indicated deniers evidenced less intense alcohol and drug-related problems and identified DSM-IV criterion items that they were most likely to deny.

Conclusions: A large majority of two generations of SDPS participants whose interviews indicated a current AUD did not characterize themselves as problem drinkers. Despite drinking amounts that far exceeded healthy limits and admitting to important life problems with alcohol, these individuals give misleading answers regarding their condition when asked general questions about drinking by health care deliverers. The authors offer suggestions regarding how to identify those drinkers in need of advice regarding dangers of their behaviors.

1. Introduction

Denial in substance use disorders (SUDs), including alcohol use disorders (AUDs), might be broadly paraphrased as a group of processes where substance-related problems that are obvious to others are not recognized or appropriately acted upon by the individual with the problems (Buddy, 2019; Edwards, 2000; Pickard, 2016; Sher and Epler, 2004; Wooley et al., 2012). These concepts are complex and likely to develop in response to widely held societal beliefs as well as mechanisms reflecting an individual's traits regarding how they handle problems and their specific beliefs and behaviors. The denial or minimization of substance related problems interferes with decisions to seek help, impedes behavior changes, and contributes to relapses into problematic behaviors (Ferrari et al., 2008; Wing, 1996; Sher and Epler, 2004).

About 30 % to > 50 % of individuals with AUDs or other SUDs evidence denial (Basurto et al., 2009; Clark et al., 2016; Fendrich and Johnson, 2005). False negative reports of a general substance-related problem can include statements that the person did not take the

substance when he or she had been using, admissions of use but denial of high levels of consumption or associated problems that occurred, or a person admitting to substance related difficulties but denying an overarching problem with the substance (Sher and Epler, 2004; Wing, 1996). For alcohol, the focus of the current analyses, the latter might be a form of denial that is especially problematic for clinicians who only ask general questions about substance use and problems rather than using standardized screening questionnaires, like the Alcohol Use Disorders Identification Test (AUDIT) (Sanchez-Roige et al., 2019). In such situations, the clinician might ask questions like "How much do you drink?" or "How would you describe your drinking pattern?". The answer they might receive from many individuals who fit the definition of an AUD could be something like "I'm a moderate social drinker".

Much of the literature on denial has focused on underlying mechanisms that contribute to false negative reports regarding SUDs. Possible mechanisms include deliberate and conscious lies to avoid negative views from others or consequences of the behaviors (Fewell and Bissell, 1978) and false negative reports from cognitive difficulties in correctly appraising the dangers of the substance use (Rinn et al.,

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<https://doi.org/10.1016/j.drugalcdep.2020.108274>

Received 26 May 2020; Received in revised form 31 August 2020; Accepted 1 September 2020

Available online 10 September 2020

0376-8716/ Published by Elsevier B.V.

2002; Tarter et al., 1984). Other theories reflect psychodynamic defense mechanisms where persons facing substance-related psychological stressors subconsciously “defend” themselves by denying that the substance problem or adverse event occurred (George, 1990; Khantzian, 2018; Rinn et al., 2002). It is likely that multiple factors contribute simultaneously to denial (Sher and Eply, 2004; Wooley et al., 2012), and the literature suggests that the underlying mechanisms might differ with different drugs (e.g., denial to avoid negative attitudes toward the user might be more prominent for intravenous heroin than for alcohol) and for different situations (Pickard, 2016; Sher and Epler, 2004).

The current analyses focus on inaccurate denial of current AUDs in individuals who report themselves as light or moderate social drinkers. To prepare for the study we searched the literature for specific characteristics of individuals who evidence denial. Regarding demography, the most consistent data were seen for race/ethnicity where a relatively scant literature indicated that a range of denial-related behaviors were more common for African American and Hispanic American subjects than for European Americans (EA's) (Clark et al., 2016; Fendrich and Vaughn, 1994; Ferrari et al., 2008; Rosay et al., 2007). Marital status and education level did not consistently relate to the probability of denial (Ortega and Alegria, 2005; Rinn et al., 2002), although one study suggested more denial among lower educated individuals (Fendrich and Vaughn, 1994). Even more inconsistent results were seen for the relationship to denial for sex, age, socioeconomic status or income (Clark et al., 2016; Fendrich and Vaughn, 1994; Ortega and Alegria, 2005; Rinn et al., 2002; Rosay et al., 2007).

We found no published studies regarding whether an individual's report of specific AUD criteria items (e.g., American Psychiatric Association, 1994) were more likely to relate to inaccurate recognition or reluctance to admit to an overall alcohol problem. Optimally, the impact of specific criteria should be evaluated while also considering the relationship of denial to drinking quantities, the number of alcohol problems, and whether an individual has alcohol abuse or dependence in DSM-IV.

Our group recently reported a phenomenon that might overlap with denial. That paper searched for characteristics of San Diego Prospective Study (SDPS) probands with AUDs whose young-adult offspring erroneously reported no significant alcohol problems in that parent (Schuckit, 2020). The attributes of the person who denies their own overarching alcohol problem might be similar to characteristics related to lack of recognition of his alcohol-related difficulties by his offspring. Items associated with an offspring's incorrect report of their father's problems included the lack of endorsement of four specific AUD criterion items. These included probands denying spending a great deal of time to obtain, use, and/or recover from alcohol (criterion 5 in the DSM-IV criteria for dependence [D5]), not endorsing decreasing important activities due to alcohol (criterion D6), and not admitting to continuing to use alcohol despite physical and/or psychological problems (D7) or despite social and/or interpersonal problems (criterion 4 for abuse [A4]) (Schuckit, 2020).

This paper uses data from two SDPS generations to evaluate characteristics associated with denial of global ratings of problem drinking in individuals who admitted to specific abuse or dependence criteria. The analyses test five hypotheses: 1) Based on clinical experience and the literature we estimate 30%–50% of SDPS AUD subjects will not rate themselves as falling into problem drinking categories; 2) The lower the number of AUD criteria endorsed the greater the chance of denying having a general problem with alcohol; 3) The lower the maximum drinks endorsed the greater the probability of denying having a general problem with alcohol; 4) Individuals with alcohol abuse will be more likely than those with alcohol dependence to deny having a general problem with alcohol; and 5) The absence of the four criterion items that related to false negative reports by offspring of their proband father's AUD (Schuckit, 2020) will also relate to that father's own denial of a general problem with alcohol including D5 (much time involved with alcohol); D6 (decreasing or giving up important activities due to

alcohol); D7 (drinking despite physical/ psychological problems due to alcohol); and A4 (use despite social/interpersonal alcohol-related problems).

2. Methods

2.1. Recruitment of original SDPS probands

Following University of California, San Diego (UCSD) Institutional Review Board (IRB) approval, randomly mailed questionnaires were used to recruit 453 SDPS probands as drinking 18-to-25-year-old male UCSD students who never met criteria for an AUD, SUD, bipolar disorder or schizophrenia and did not currently have a major depressive or anxiety disorder. Half reported a biological father with DSM-III alcoholism and half had no known alcoholic relative (American Psychiatric Association, 1980; Schuckit and Gold, 1988).

2.2. Proband follow-ups, evaluation of SDPS probands' offspring, and offspring follow-ups

Beginning in 1988, the 453 probands began participation in every five-year personal follow-ups using a semi-structured interview (Schuckit et al., 2019a,b) reviewing substance use and problems based on the Third-Revised and Fourth Diagnostic and Statistical Manuals (DSM-III-R and DSM-IV) (American Psychiatric Association, 1987, 1994). The questions were extracted from the Semi-Structured Assessment for the Genetics of Alcoholism (SSAGA) (validity, retest reliabilities, and cross-interviewer reliabilities of .7–.8) (Bucholz et al., 1994; Hesselbrock et al., 1999).

Fifteen-year follow-ups included the Self Report of the Effects (SRE) of alcohol questionnaire, the Impulsiveness Subscale of the Karolinska Scales of Personality and the Zuckerman Sensation Seeking Scale (Gustavsson et al., 2000; Schuckit, 2018a; Schuckit et al., 2016a, 2019a, 2019b; Zuckerman, 1978). The SRE records numbers of standard drinks required for up to four effects including a first effect, feeling dizzy or slurring speech, unstable standing, and unplanned falling asleep. SRE-5 scores for the first five times of drinking and is generated by the total drinks in that period needed across effects divided by the number of effects endorsed. SRE-T scores reflect the average across first five, heaviest drinking period, and recent 3-month drinking. Higher average drinks needed for effects indicates lower response per drink and higher future risk for alcohol problems (Daepfen et al., 2000; Ray et al., 2010; Schuckit, 2018a; Schuckit et al., 2019a,b).

As probands' biological children reached age 18, they were personally interviewed every five-years using SSAGA-based questions. The first interview following their 18th birthday included the impulsivity and sensation seeking questionnaires, and, for those with experience with drinking, the SRE.

Analyses include all 94 AUD male probands and all 176 offspring (106 males) who met AUD criteria in the five-years prior to the index interview and these participants were not chosen as proband-offspring pairs. Their SSAGA-like interviews queried their recent five-year quantities, frequencies and problems associated with substances, including all 11 DSM-IV substance-related criterion items. We added a final question to the alcohol section which asked: “Since your prior evaluation (about five-years ago), how would you label your own drinking pattern overall?” The options included: 1) nondrinker/abstainer; 2) infrequent/occasional light social drinker; 3) moderate social drinker; 4) frequent/heavy social drinker; 5) problem drinker/alcoholic; and 6) recovering alcoholic.

2.3. Analyses

The follow-up rate in the SDPS was over 90 %, and maximum likelihood procedures were used to address missing data (Collins et al., 2001) with Little's MCAR test (Little, 1988) showing data missing

Table 1

Demography, Alcohol, and Drug Related Variables for Probands Meeting Criteria for Past 5-Year DSM-IV Alcohol Use Disorders Overall and Divided into Denier and Non-Denier Subgroups.

Variables Proband	All Probands (n94) % or mean (sd)	Group 1 Deniers [n63, 67.0 %] % or mean (sd)	Group 2 Non-Deniers [n31, 33.0 %] % or mean (sd)	χ^2 (df = 1) or F-test (df = 192)	p-value
Demography					
Age	49.8 (3.96)	49.6 (3.963)	50.2 (4.04)	0.54	0.46
European-American %	98.9	100.0	96.8	2.05	0.15
Ever Married %	89.4	87.3	93.5	0.85	0.36
Any Children%	70.2	69.8	71.0	0.01	0.91
Identify with a Religion %	52.7	51.06	54.08	0.09	0.82
Education (years)	17.3 (2.32)	17.2 (2.45)	17.6 (2.05)	0.16	0.69
Alcohol					
Alcohol Dependence %	52.1	42.9	71.0	6.58	0.01
SRE-5	3.6 (1.34)	3.6 (1.36)	3.6 (1.30)	0.00	0.97
SRE-T	4.8 (1.36)	4.7 (1.42)	4.9 (1.22)	0.35	0.56
Maximum Drinks/Occasion	9.6 (4.48)	8.6 (3.60)	11.7 (5.36)	10.67	0.01
DSM-IV Criteria					
Number Items Endorsed	2.5 (1.65)	1.9 (1.03)	3.6 (2.06)	16.82	0.001
D1. Tolerance %	3.2	3.2	3.2	0.00	1.00
D2. Withdrawal %	4.3	4.8	3.2	0.12	0.73
D3. Drink Higher Amounts/Longer Periods %	57.4	57.1	58.1	0.01	0.93
D4. Desire/Unable Decrease or Control %	35.1	25.4	54.8	7.91	0.01
D5. Much Time to Get/Use/Recover	29.8	22.2	45.2	5.23	0.03
D6. Decrease Activities Due to Alcohol %	6.4	3.2	12.9	3.29	0.07
D7. Use Despite Physical/Psychological Probs %	18.1	6.3	41.9	17.76	0.001
A1. Use Yields Failed Obligations	19.1	12.7	32.3	5.13	0.03
A2. Use in Hazardous Situations%	43.6	39.7	51.6	1.20	0.27
A3. Recurrent Legal Problems %	1.1	0.0	3.2	2.05	0.16
A4. Use Despite Social/Interpersonal Probs %	28.7	15.9	54.8	15.41	0.001
Drugs					
Smoking %	17.0	12.7	25.8	2.53	0.12
Use CB %	30.9	30.2	32.3	0.04	0.84
Drugs other than CB %	9.6	7.9	12.9	0.59	0.43
SUD CB %	4.3	4.8	3.2	1.22	0.55
SUD Other Drugs %	2.1	0.0	6.5	4.15	0.05
Personality					
Karolinska Impulsivity	20.9 (2.74)	20.8 (2.64)	21.1 (2.96)	0.22	0.64
Zuckerman Sensation Seeking	21.6 (5.29)	22.0 (5.14)	20.8 (2.58)	1.06	0.31

DSM-IV = Fourth Diagnostic and Statistical Manual; df = degrees of freedom; SRE-5 and SRE-T = Self Report of the Effects of Alcohol for first 5 times drink and for Total; D1-D7 DSM-IV paraphrased dependence criteria in order presented in DSM-IV; A1-A4 DSM-IV paraphrased abuse criteria in order presented in DSM-IV; CB = cannabis; SUD = Substance Use Disorder; Probs = problems.

Table 2

Backwards Elimination Logistic Regression Analyses for Probands, Predicting Denial Using Variables Significantly Different Across Denial Groups in Table 1.

Variables Probands	Odds Ratio	p-value
D5. Much Time to Get/Use/Recover	0.13	< .001
D7. Use Despite Physical or Psychological Probs	0.07	< .001
A4. Use Despite Social or Interpersonal Probs	0.09	< .001
SUD: other than CB	0.04	< .03
Nagelkerke Pseudo R ²	.42	

Definitions are the same as in Table 1.

completely at random ($p = .649$). Tables 1,2,3, respectively, describe AUD proband and AUD offspring demography, personality, and substance-related variables for all relevant participants combined and then separately for subjects who rated themselves as falling into categories 1–3 regarding their drinking pattern overall (i.e., deniers [Group 1]) versus those who rated themselves as categories 4–6 (non-deniers [non-deniers]). The deniers were reporting categories that might indicate to clinicians that a patient does not have problems with alcohol. The first step, univariate comparisons of Groups 1 versus 2, used F-tests for continuous variables and χ^2 for categorical data. Tables 2 and 4 present our key results involving backwards elimination logistic regression

analyses using variables that significantly differentiated between deniers and non-deniers in Tables 1 and 3. Finally regarding methods, for both probands and offspring data, multicollinearity was assessed using both simple correlation matrixes among the variables and evaluating for variance inflation factors (VIF). For correlations, values greater than or equal to 0.80 and for VIF values greater than 5 indicate possible multicollinearity (O'Brien, 2007). For probands there were no correlations greater than 0.80 with the largest $r = .47$ and the largest VIF = 1.64. For offspring, out of 171 correlations, 2 were high (smoking with age = .80 and dependence item 6 (D6) with abuse item 3 (A3) = .89), but almost all VIF's were less than 2, except for 3 with values up to 2.47. Thus, multicollinearity was not apparent in these data sets.

3. Results

Table 1 for probands and Table 3 for offspring each first present data for the entire relevant sample and then separately for Group 1 denier and Group 2 non-denier participants. Self-ratings of their general alcohol status among AUD probands included 0% nondrinkers, 12 % infrequent/occasional light social drinkers, 55 % moderate social drinkers, 25 % frequent/heavy social drinkers, 6% problematic drinkers/alcoholics and 2% recovering alcoholics. AUD offspring self-ratings were 0% non-drinkers, 24 % infrequent/occasional light social drinkers, 58 % moderate social drinkers, 13 % frequent/heavy social

Table 3

Demography, Alcohol, and Drug Related Variables for Offspring Meeting Criteria for Past 5-Year DSM-IV Alcohol Use Disorders Overall and Divided into Denier and Non-Denier Subgroups.

Variables Offspring	All Offspring [n176] % or mean (sd)	Group 1 Deniers [n145, 82.4 %] % or mean (sd)	Group 2 Non-Deniers [n31, 17.6 %] % or mean (sd)	χ^2 (df = 1) or F-test (df = 174)	p-value
Demography					
Sex (female)	39.8	42.1	29.0	1.82	0.18
Age	26.2 (5.15)	25.8 (5.10)	27.9 (5.07)	4.51	0.04
European-American %	90.3	89.7	93.5	0.44	0.51
Ever Married %	29.0	26.9	38.7	1.73	0.19
Any Children %	8.5	7.4	1.1	0.21	0.65
Identify with a Religion %	34.1	35.2	29.0	0.43	0.52
Education (years)	15.1 (2.40)	15.1 (2.47)	15.1 (2.06)	0.00	1.00
Alcohol					
Alcohol Dependence %	62.5	55.2	96.8	18.56	0.001
SRE-5	3.5 (1.16)	3.5 (1.18)	3.7 (1.08)	0.98	0.32
SRE-T	4.9 (1.43)	4.7 (1.26)	5.8 (1.76)	16.06	0.001
Maximum Drinks/Occasion	11.5 (3.63)	10.9 (3.25)	14.5 (3.85)	27.70	0.001
DSM-IV Criteria					
Number Items Endorsed	4.1 (1.85)	3.6 (1.41)	6.3 (2.05)	59.50	0.001
D1. Tolerance %	56.8	51.0	83.9	11.22	0.001
D2. Withdrawal %	6.8	2.8	25.8	21.36	0.001
D3. Drink Higher Amounts/Longer Periods %	77.8	75.2	90.3	3.40	0.07
D4. Desire/Unable Decrease or Control %	27.8	22.1	54.8	13.65	0.001
D5. Much Time to Get/Use/Recover %	87.6	84.8	100.0	5.38	0.02
D6. Decrease Activities Due to Alcohol %	30.7	23.4	64.5	20.25	0.001
D7. Use Despite Physical/Psychological Probs %	10.2	6.9	25.8	9.95	0.002
A1. Use Yields Failed Obligations %	56.3	51.5	77.4	6.85	0.009
A2. Use in Hazardous Situations %	27.3	23.4	45.2	6.07	0.014
A3. Recurrent Legal Problems %	3.4	1.4	12.9	10.30	0.001
A4. Use Despite Social/Interpersonal Probs%	20.5	14.5	48.4	18.04	< 0.001
Drugs					
Smoking %	19.9	13.8	48.4	19.18	< 0.001
Use CB %	79.5	76.6	93.5	4.54	0.04
Drugs other than CB %	37.5	33.1	58.1	6.79	0.009
SUD CB %	19.3	15.9	35.5	6.31	0.012
SUD Other Drugs %	3.4	1.4	12.9	10.30	0.001
Personality					
Karolinska Impulsivity	21.8 (3.59)	21.7 (3.52)	22.7 (3.84)	2.51	0.12
Zuckerman Sensation Seeking	18.4 (6.41)	17.7 (5.99)	21.3 (7.54)	7.14	0.01

Definitions are the same as in Table 1.

drinkers, 2% problematic drinkers/alcoholics and 3% recovering alcoholics.

Table 1 demonstrates that overall most AUD probands were European American, had ever married, 70 % had children, and their average education was 17 years. On average, probands endorsed 2.5 AUD criteria and 52 % were alcohol dependent with the remainder meeting alcohol abuse. Thirty-one percent had used cannabis in the recent five-years, 4% met cannabis use disorder criteria, 17 % smoked cigarettes, 10 % used other illicit drugs, including 2% who met SUD criteria on that substance. Among AUD probands, 67 % were classified as deniers of problematic drinking (Group 1). Significant alcohol-related univariate comparisons between probands in Groups 1 and 2 revealed that deniers were less likely to have alcohol dependence, reported lower average maximum drinks, and were less likely to endorse five AUD criteria, including dependence criteria D4, D5, and D7, along with abuse criteria A1 and A4. These included three of the four criteria predicted in Hypothesis 5 (the fourth criterion, giving up activities [D6] was only a trend). Deniers were also less likely to have SUDs for non-cannabis drugs. While not noted in the table, the correlation between a false negative family report of a father with an AUD in the prior paper and an AUD father being a denier in the current analysis was 0.28 ($p < .01$).

Table 2 presents results predicting AUD proband denier status using a backwards elimination logistic regression analysis that included variables that differed significantly across deniers and non-deniers in Table 1. Four variables contributed significantly to the analysis

including three of the criteria predicted in Hypothesis 5 along with a SUD on illicit drugs other than cannabis.

Tables 3 and 4 focus on 176 AUD offspring who were primarily European American, 40 % of whom were women, 29 % had ever been married, and individuals who reported on average 15 years of education. Sixty-two percent met interval criteria for alcohol dependence, they reported on average 11 maximum drinks per occasion and endorsed an average of four AUD criteria. One in five smoked cigarettes in the prior 5 years, 80 % used cannabis, 19 % had a cannabis use disorder, and 37 % had used other illicit drugs, including 3% who developed a SUD on those substances. Comparisons of Groups 1 and 2 revealed that the 82 % who were deniers were slightly younger and had lower proportions with alcohol dependence, lower average maximum drinks, and fewer AUD criteria endorsed compared to non-deniers. Group 1 deniers were also less likely to endorse every specific AUD criterion except for D3 (drinking more or longer than intended). AUD offspring in Group 1 on average reported fewer drinks required for effects across the time-frames (SRE-T), were less involved with other drugs and had lower scores on sensation seeking.

Group 1 and 2 offspring comparisons were repeated for the 106-male offspring, 84 (79.2 %) of whom were deniers. Here, results were generally consistent with those in Table 3. Analyses using the 70 female offspring alone could not be adequately interpreted because there were only 9 non-deniers.

Table 4 describes the backwards elimination regression analysis predicting denial in AUD offspring using variables that differed

Table 4
Backwards Elimination Logistic Regression Analyses for Offspring Predicting Denial Using Variables Significantly Different Across Denial Groups in Table 3.

Variables Offspring	Odds Ratio	p-value
Alcohol Dependence	0.11	.04
D2. Withdrawal	0.85	.001
D6. Decrease Important Activities Due to Alcohol	0.26	.01
Smoking	0.23	.01
SUD: other than CB	0.07	.02
Nagelkerke Pseudo R ²	.47	

Definitions are the same as in Table 1.

significantly across Groups 1 and 2 in Table 3. Like Table 2, significant predictors of denial involved indicators of less intense alcohol involvement and less use and/or problems with other drugs. The five specific variables in Table 4 included only one that contributed to Table 2 (SUD for non-cannabis drugs) and one variable noted in Hypothesis 5 (giving up important activities to drink [D6]), but D6 had not entered the regression analysis for probands. The three other variables included lower proportions of deniers who smoked, reported alcohol withdrawal, or met criteria for alcohol dependence. If regression analyses were limited to the 106 AUD males, denial remained associated with lower levels of both alcohol and drug related problems, but the specific items for male offspring included a lower average maximum drinks per occasion, lower cannabis use, and deniers had a lower average age.

4. Discussion

Within the same interview session 67 % of SDPS probands with current AUDs and 82 % of current AUD offspring endorsed enough alcohol problems to meet DSM-IV AUD criteria but denied having a general alcohol problem. Those denial rates were higher than the levels predicted in Hypothesis 1 and occurred despite deniers reporting averages of nine to 11 maximum drinks across probands and offspring. If a clinician had asked these men and women general questions about their drinking status (e.g., “describe your drinking” or “how much do you drink”) that health care deliverer probably would not have recognized their patient’s drinking problem. The high rate of denial reported here was not anticipated in subjects with higher education and many life achievements, individuals who might have had an advantage in noting that a general alcohol problem was present. However, despite their heavy drinking and multiple alcohol-related problems, their high level of functioning might have convinced these subjects that they did not meet their stereotype of what individuals with AUDs are like.

These findings underscore the potential dangers when clinicians rely on simple overall questions to identify individuals who might benefit from motivational interviewing or brief interventions to mitigate future alcohol problems (Schuckit, 2018; Vaselaki, 2006). A more appropriate way to screen patients for alcohol impairment would be to use a standardized and more detailed review of patterns of drinking and alcohol-related problems such as the ten item AUDIT. This instrument takes only a few minutes complete and can be filled out by patients in the waiting room (Babor, 2001; Sanchez-Roige et al., 2019). Such standardized approaches might be especially useful for identifying high functioning individuals with AUDs whose SES might erroneously imply that they are less likely to have alcohol problems.

Our analyses searched for potential correlates of one form of denial to help clinicians and researchers better understand denial and to optimize their ability to identify these individuals who might benefit from advice. The data indicate that false negative self-reports regarding general alcohol problems did not differ significantly across males and females, participants who were single or married, levels of education, sex, and in relationship to identification with a religion. Although some prior studies reported a higher rate of denial in African American and

Hispanic individuals (e.g., Clarke et al., 2016), that could not be adequately tested in the SDPS sample.

It is not surprising that regression analyses in the current data support Hypotheses 2–4, each of which have support in the literature. In both generations, denial was more common among AUD individuals who endorsed fewer DSM-IV criteria, reported lower maximum drinks, and those with alcohol abuse rather than dependence. However, the level of alcohol involvement among these deniers was not benign. Proband and offspring deniers admitted to an average of nine and 11 maximum drinks, respectively, 57 % and 75 % reported drinking higher quantities or for longer periods than intended, 40 % and 23 % admitted to using alcohol in hazardous situations, 13 % and 52 % reported missing important obligations because of alcohol, while 25 % and 22 % endorsed persistent desires or inability to cut down or stop drinking. This unhealthy level of drinking and life problems portend a potential for more severe future alcohol problems (Schuckit, 2018). Several additional findings in Tables 1 and 3 were not supported in regression analyses where multiple significant characteristics were evaluated together (e.g., the SRE result and possible offspring group differences in sensation seeking).

The specific AUD criteria stated in Hypothesis 5 reflected characteristics of AUD probands whose young adult offspring in a prior paper gave a false negative report of a family history of alcohol problems (Schuckit, 2020). Our data indicated a correlation of 0.28 between a proband’s own denial of a general alcohol problem and lack of recognition of problems in that parent by their offspring. Three of the four criteria that were associated with false negative family history reports by offspring also characterized AUD probands with their own denial including much time spent with alcohol (D5), use despite physical/psychological problems (D7), and use despite social/interpersonal problems (A4). These results highlight AUD criteria clinicians might take time to define when trying to help individuals better understand what AUDs are and to gain greater insight into their future vulnerabilities toward adverse alcohol-related outcomes.

The AUD criterion items associated with this form of denial in probands were also evaluated in the 176 AUD offspring. In contrast to probands, deniers in the younger generation evidenced lower proportions who endorsed almost all DSM-IV AUD criteria, including the four items predicted in Hypothesis 5. The only predicted criterion that added significantly to the AUD offspring’s regression equation in Table 4 was giving up important activities due to alcohol (D6), and this did not contribute significantly to the regression analysis for probands in Table 2. It is not possible to determine whether the difference across the generations regarding specific DSM criteria that related to denial are artifacts of the larger sample of offspring, age differences across the generations, or cohort differences in the cultures in which they live. However, it is important to emphasize that regression analyses in both generations indicated that denial was related to a lower degree of both alcohol and drug use and problems. Regarding the latter, adverse consequences related to other drugs might increase a person’s awareness of potential problems with alcohol.

Another interesting finding related to the overall differences across generations regarding the specific criteria items endorsed by AUD probands and AUD offspring in the first data columns of Tables 1 and 3. One striking finding involved the 4% of AUD probands overall who admitted to tolerance in the prior five years compared to 57 % who endorsed tolerance in AUD offspring. A cursory review of tolerance reports over the years in SDPS AUD probands indicated that this variable had been endorsed by AUD probands at age 35 at a rate similar to the current AUD offspring. However, the proportions of probands who reported tolerance in the five years prior to interview decreased steadily with each subsequent interview. The key aspect of the tolerance question used here might be the emphasis on the recent five-year period. It is possible that self-perceived tolerance might be strongest at younger ages when drinking is escalating but might not be as apparent as individuals maintain and decrease the maximum drinks with advancing

age. Space constraints do not allow for an expanded examination of the phenomenon of changes in rates of endorsement of AUD criteria as individuals age, but that question will be revisited in a future paper.

The data presented here must be viewed with several caveats in mind. First, we report detailed information gathered prospectively every five years from 453 families by the same principal investigators using the same interviews and questionnaires across two generations. Those steps allowed a unique opportunity to ask questions and compare results across time and across generations. However, it would be difficult and costly to carry out a similar approach in a much larger and more diverse population, with the result that it is unclear whether the current findings would be seen in families with different racial or ethnic backgrounds, a wider range of socioeconomic characteristics, and individuals from different areas of the world. Second, denial is a broad concept lacking general agreement regarding the optimal definition, and the current analyses focus on only one of several types of denial that relate to substance use and problems. Third, the global question of how individuals view their drinking pattern was developed for this study and has not been formally evaluated for reliability and validity. Finally, to keep the time spent by participants every five years to a reasonable limit the characteristics evaluated here were not exhaustive and there is a need for future studies to consider a wider range of intrapersonal and societal mechanisms that might have contributed to the type of denial studied here.

In conclusion, denial of a general alcohol problem by individuals who admitted to multiple AUD criteria items was quite common in the SDPS, despite prodigious maximum drinking quantities. This pattern of denial indicates that greater efforts need to be made to educate our patients and our colleagues regarding what an AUD is and how serious the prognosis can be. For AUD probands, deniers were less likely to endorse several specific criteria that might offer some insights into why they do not consider themselves problem drinkers. Whether these problems were truly absent or if the person was reluctant to admit their presence, motivational interviewing, brief interventions and related approaches might help patients recognize that the absence of endorsement of those four items does not mean that the alcohol problems are not serious.

Role of funding source

Nothing declared

CRedit authorship contribution statement

Marc A. Schuckit: Conceptualization, Funding acquisition, Formal analysis, Writing - original draft. **Dennis F. Clarke:** Supervision, Data curation. **Tom L. Smith:** Software, Formal analysis. **Lee Anne Mendoza:** Data curation.

Declaration of Competing Interest

The authors report no declarations of interest.

Acknowledgements

The author would like to acknowledge the National Institute of Alcoholism and Alcohol abuser01 AA021162.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.drugalcdep.2020.108274>.

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