

## Reliability and Validity of Life-course Alcohol Consumption Measures: The 2005 National Alcohol Survey Follow Up

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Presented at the 139<sup>th</sup> Annual Meeting and Exposition of the  
American Public Health Association, Washington DC,  
October 30-November 2, 2011

Supported by US NIAAA Center Grant P50 AA005595



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## Background: Heavy drinking over the Lifetime

- Drinking patterns may change for many reasons, including:
  - **Aging** or maturation (though this varies by culture and country)
  - Role changes like **getting married, having children**
  - or **divorce and separation** (or other traumatic life events)
  - **Employment**, getting or losing a job; **unemployment**
  - Going to **college** or leaving college; at home or leaving home



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## Heavy drinking over the Lifetime

- Additional reasons drinking patterns may change:
  - Being in the **military**; deployment to another country; combat
  - Going on a **diet**; activity level, serious sport ('being in training')
  - Changing **friendships**; who one hangs out with (and where)
  - Developing or fearing **health problems** (meds, MD cautions)
  - Developing or recovering from **alcohol problems**
  - and Environmental **availability, cost and affordability**, etc.



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## Background: Lifetime heavy drinking

- Numerous lifetime drinking measures exist, e.g., Timeline Follow Back (Sobel & Sobel, 1992); Lifetime Drinking History (Skinner & Sheu, 1982) **Most are very lengthy; this has deterred adoption in alcohol surveys**
- Russell et al (1997): two forms of Cognitive Lifetime Drinking History, a "floating age intervals" and a fixed decade-based format: **Number of times intoxicated in lifetime did not differ between the two formats**
- For use in the 1995 NAS we independently developed a lifetime measure: **The NAS Decades-based Heavy Drinking Frequency**
- **Asses 5+ Frequency during teens, 20s, 30, 40s (also age of onset)**
- This decades measure is in the NAS series in 1995, 2000, 2005, 2010



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## Approach and working hypotheses: Lifetime heavy drinking

- Heavy drinking frequency by decade is measured rather than volume; 2005 follow up has 2.7 year mean interval
- Consider lifetime heavy drinking but also lifetime maximum and age of drinking onset (more than small sips)
- Accuracy of heavy drinking history data may vary by ethnic/racial group, gender, age, etc.
- Expect that heavy drinking in decade closest to current period may be (a) better recalled and (b) more influential
- In predicting alcohol-related problems we hypothesized that lifetime heavy drinking measures would provide incremental information (beyond current heavy drinking)

## Consistency of reporting of lifetime alcohol use<sup>a</sup>

MEASURE	OVERALL	Drinkers at T1	Prior drinkers at T1	Abstainer at T1	
<b>Lifetime Use/Not Agreement %</b> (Total n = 2078)	<b>93.5%</b>	<b>94.7%</b>	<b>85.5%</b>	<b>74.4%</b>	
<b>Lifetime Drinkers Test-Retest <math>\rho</math></b> (Drinkers n = 1650)	<b>Current or ex-drinker SAMPLE</b>	<b>SUBGROUPS</b>			
<b>Variable</b>	<b>Gender</b>	<b>Age</b>	<b>Ethnicity</b>	<b>Heavy drinking</b>	
				<b>Follow-up Mode</b>	
<b>Age of onset</b> (Spearman's $\rho$ )	<b>.70</b>	Men .66 < 50 .59 Women .72 $\geq$ 50 .67	White .74 Black .69 Hispanic .60	None .69 $\geq$ Monthly .82	Phone .70 Mail .69
<b>Lifetime Maximum<sup>b</sup></b> (Spearman's $\rho$ )	<b>.76</b>	Men .68 < 50 .68 Women .77 $\geq$ 50 .68	White .73 Black .65 Hispanic .59	None .69 $\geq$ Monthly .73	Phone .71 Mail .68

<sup>a</sup> Based on mean follow-up period of 2.7 years

<sup>b</sup> Lifetime maximum = largest amount ever drunk on any one day

Source: 2005 NAS11 and NAS Tracer Follow-up (Mean 2.5 Years)

## Consistency of reporting of lifetime heavy drinking

Heavy drinking Measure	All Current Drinkers	SUBGROUPS		
<b>Total days across decades (Teens to Thirties)</b> (Test-Retest Spearman's $\rho$ )				
	<b>.69</b>	<b>GENDER</b>	<b>AGE</b>	<b>ETHNICITY</b>
		Men .63	<30 .57	White .68 Black .56 Hispanic .56
		Women .68	$\geq$ 30 .70	
<b>Decade-specific heavy drinking at least monthly</b> (% agreement)				
		<b>ETHNICITY</b>		
Teens	81.0%			White 80.5% Black 85.6% Hispanic 79.8%
Twenties	81.5%			White 82.5% Black 80.0% Hispanic 76.8%
Thirties	82.7%			White 84.5% Black 78.8% Hispanic 75.6%

Source: 2005 NAS11 and NAS Tracer Follow-up (Mean 2.7 Years)

## Predictive validity of lifetime heavy drinking for current (12 month) Alcohol Dependence<sup>a</sup>

Variable	Overall Analysis	Ethnic-specific Analyses		
		Whites only (n = 1855)	Blacks only (n = 269)	Hispanics Only (n = 275)
	Over Age 40 (n = 4,256) AOR ( $\rho$ )	AOR ( $\rho$ )	AOR ( $\rho$ )	AOR ( $\rho$ )
<b>Nagelkerke R<sup>2</sup></b>	<b>.38</b>	<b>.30</b>	<b>.52</b>	<b>.14</b>
<b>Age</b>	0.96 (.15)	0.97 (.34)	0.95 (.37)	1.02 (.71)
<b>Gender</b>	0.95 (.92)	.83 (.80)	2.13 (.46)	.55 (.60)
<b>Black ethnicity</b>	3.94* (.01)	-	-	-
<b>Hispanic ethnicity</b>	3.40 (.11)	-	-	-
<b>Days 5+ in past year<sup>b</sup></b>	<b>1.59*** (&lt;.001)</b>	<b>1.58*** (&lt;.001)</b>	<b>1.56*** (&lt;.001)</b>	<b>2.12 (.09)</b>
<b>Cumulative 5+ Days<sup>c</sup></b>	<b>1.31** (.003)</b>	<b>1.29* (.04)</b>	<b>1.34* (.04)</b>	<b>0.61 (.52)</b>

<sup>a</sup> Analyses include those aged 41 and older (n = 2429)

<sup>b</sup> For interpretability, scaled so that unit is 36 days (a 10% increase)

<sup>c</sup> For interpretability, scaled so that unit is 780 days (a 10% increase)

\* p < .05 \*\* p < .01 \*\*\* p < .001

## Predictive validity of lifetime heavy drinking for current (12 month) Alcohol Dependence

Variable	Overall Analysis	Ethnic-specific Analyses <sup>a</sup>		
		Over Age 40 (n = 4,256) AOR (β)	Whites only (n = 2755) AOR (β)	Blacks only (n = 404) AOR (p)
<i>Nagelkerke R<sup>2</sup></i>	.342	.332	.428	.122
Age	0.95* (.03)	0.89* (.000)	0.95 (.70)	0.99 (.843)
Gender	0.56 (.19)	1.54 (.085)	1.06 (.937)	1.86 (.245)
Black ethnicity	4.38** (.001)	-	-	-
Hispanic ethnicity	5.19** (.002)	-	-	-
<b>Days 5+ in the past year</b>	<b>1.01* (.0001)</b>	<b>1.01* (.0001)</b>	<b>1.009* (.0001)</b>	<b>1.01* (.0001)</b>
Lifetime 5+ ≥ monthly (decade-specific years)				
5+ in Teens	1.58 (.61)	2.68 (.311)	1.00 (.998)	0.64 (.618)
5+ in Twenties	4.21* (.02)	3.58 (.142)	8.07* (.023)	0.62 (.440)
5+ in Thirties	7.18** (.0004)	8.12* (.012)	8.07** (.002)	0.83 (.781)

<sup>a</sup> Ethnic-specific analyses include those 31 and older

\* p < .05 \*\* p < .01 \* p < .001

## Predictive validity of lifetime heavy drinking for current (12 month) Alcohol Consequences<sup>a</sup>

Variable	Overall Analysis	Ethnic-specific Analyses		
		Over Age 40 (n = 4,256) AOR (p)	Whites only (n = 1855) AOR (β)	Blacks only (n = 269) AOR (p)
<i>Nagelkerke R<sup>2</sup></i>	.31	.23	.47	.09
Age	0.95* (.03)	0.96 (.16)	0.89 (.06)	.99 (.97)
Gender	1.14 (.77)	.91 (.87)	2.99 (.21)	.35 (.46)
Black ethnicity	3.71** (.004)	-	-	-
Hispanic ethnicity	1.31 (.74)	-	-	-
<b>Days 5+ in past year<sup>b</sup></b>	<b>1.50*** (&lt;.001)</b>	<b>1.50*** (&lt;.001)</b>	<b>1.44*** (&lt;.001)</b>	<b>1.73 (.22)</b>
<b>Cumulative 5+ Days<sup>c</sup></b>	<b>1.26** (.003)</b>	<b>1.26* (.03)</b>	<b>1.24 (.08)</b>	<b>0.82 (.80)</b>

<sup>a</sup> Analyses include those aged 41 and older (n = 2429)

<sup>b</sup> For interpretability, scaled so that unit is 36 days (10% increase)

<sup>c</sup> For interpretability, scaled so that unit is 780 days (10% increase)

\* p < .05 \*\* p < .01 \*\*\* p < .001

## Predictive validity of lifetime heavy drinking for current (12 month) Alcohol Use Disorder<sup>a</sup>

Variable	Overall Analysis	Ethnic-specific Analyses		
		Over Age 40 (n = 4,256) AOR (p)	Whites only (n = 1855) AOR (p)	Blacks only (n = 269) AOR (p)
<i>Nagelkerke R<sup>2</sup></i>	.33	.28	.45	.14
Age	0.95* (.02)	0.96 (.10)	0.91 (.09)	1.02 (.71)
Gender	1.01 (.98)	.82 (.71)	3.36 (.16)	.55 (.60)
Black ethnicity	3.05* (.02)	-	-	-
Hispanic ethnicity	1.66 (.48)	-	-	-
<b>Days 5+ in past year<sup>b</sup></b>	<b>1.54*** (&lt;.001)</b>	<b>1.54*** (&lt;.001)</b>	<b>1.43*** (&lt;.001)</b>	<b>2.12 (.09)</b>
<b>Cumulative 5+ Days<sup>c</sup></b>	<b>1.30*** (&lt;.001)</b>	<b>1.31** (.006)</b>	<b>1.23 (.09)</b>	<b>0.61 (.52)</b>

<sup>a</sup> Analyses include those aged 41 and older (n = 2429)

<sup>b</sup> For interpretability, scaled so that unit is 36 days (10% increase)

<sup>c</sup> For interpretability, scaled so that unit is 780 days (10% increase)

\* p < .05 \*\* p < .01 \*\*\* p < .001

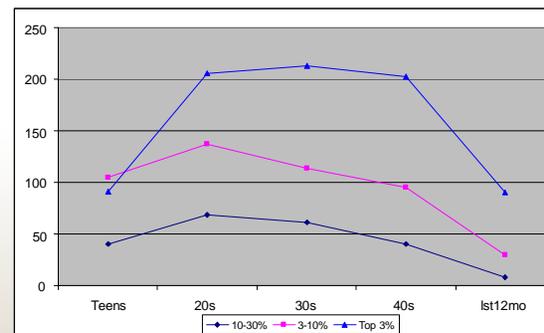
## Reliability of Lifetime Drinking Measures

- Alcohol use status in the lifetime is consistently reported overall, especially for drinkers, with lower agreement for lifetime abstainers
- Adequate (moderate) agreement was found for age of drinking onset, lifetime maximum consumption, and lifetime heavy drinking
- Differences by subgroups – gender, age and ethnicity – do not appear to be substantial but some differences are seen
- Heavy drinkers (Monthly 5+/4+) are somewhat more consistent in reporting age of onset and lifetime maximum than those not reporting regular heavy drinking in the past year

## Predictive Validity of Lifetime Drinking Measures

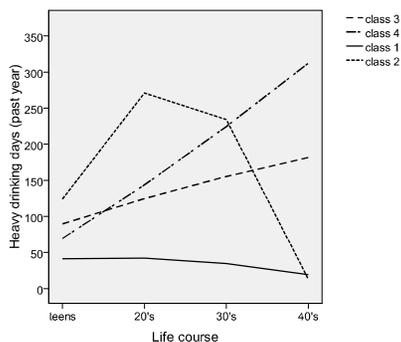
- For those 41 and older, controlling current heavy drinking, 5+ frequency in 20s and especially 30s (but not teens) is predictive of current alcohol dependence (exception is Hispanics)
- In an 11-year NDI all-cause mortality follow up to the 1995 NAS both drinking pattern at baseline and lifetime heavy drinking predict death:
- The 2 highest risk groups both reported 5+ for 20 years or more:
  - (a) ex-drinkers who abstained at the 1995 baseline (HR=2.5, p<0.05)
  - (b) those who drank 5+ at least monthly at baseline (HR=1.8, p<0.1), i.e., those with long histories and continued hazardous drinking patterns

## Profiles based on Cumulative number of 5+ days: 3 Heaviest Groups Aged 41+ in 1995 NAS<sup>a</sup>



<sup>a</sup> Men and women ever drinking 5+ (n=2,311) Top 3% (n=147); >3-10% (n=362); >10-30% (n=968); NOT SHOWN: > 30% (n=834); Lifetime abstainer (n=1,230); Never 5+ (n=1,350)

## Men's Heavy Drinking Trajectories in 1995 NAS<sup>a</sup>



<sup>a</sup> Growth Mixture Modeling—men ever drinking 5+ (n=677) Class 1: Steady Low (n=541); Class 2: Rise then Fall (n=40); Class 3: Steady Increase (n=52); Class 4: Steep Increase (n=44)

## Future Plans with Lifetime Drinking Measures

- We expect to look at how PRIOR heavy drinking affects alcohol-attributed and non attributed morbidity (health harms) we have data on the time and duration of health problems, whether doctor diagnosed, and other severity indicators
- We can examine the sick quitter hypothesis: Whether earlier occurrence (or fears) of health problems alter the binge trajectory
- Many prospective mortality studies have been based on one-time (current) alcohol use measures; studies underway are investigating the possible added contribution of LONG-TERM heavy drinking

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