

Supplementary Online Content

Zhang R, Shen L, Miles T, et al. Association of low to moderate alcohol drinking with cognitive functions from middle to older age among US adults. *JAMA Netw Open*. 2020;3(6):e207922. doi:10.1001/jamanetworkopen.2020.7922

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This supplementary material has been provided by the authors to give readers additional information about their work.

eTable 1. Baseline Statistics of the Study Population With P Values for Between Group Differences

	Overall (n=19,887)	Total Cognition Score			Mental Status			Word Recall			Vocabulary		
		Low (n=3,619)	High (n=9,064)	p	Low (n=2,972)	High (n=9,711)	p	Low (n=9,538)	High (n=10,349)	p	Low (n=2,444)	High (n=7,487)	p
Age, mean (SD)	61.81 (10.24)	67.75 (8.40)	67.16 (8.26)	<0.001	67.89 (8.60)	67.15 (8.21)	<0.001	61.82 (10.11)	61.81 (10.35)	0.959	70.04 (7.67)	69.59 (7.29)	0.008
Female, N (%)	11943 (60.1)	2055 (56.8)	5389 (59.5)	0.006	2035 (68.5)	5409 (55.7)	<0.001	4930 (51.7)	7013 (67.8)	<0.001	1455 (59.5)	4484 (59.9)	0.773
Black, N (%)	2937 (14.8)	1043 (28.8)	637 (7.0)	<0.001	987 (33.2)	693 (7.1)	<0.001	2051 (21.5)	886 (8.6)	<0.001	760 (31.1)	500 (6.7)	<0.001
Single or Separated	5596 (28.1)	1429 (39.5)	2601 (28.7)		1297 (43.6)	2733 (28.1)		2857 (30.0)	2739 (26.5)		1034 (42.3)	2342 (31.3)	<0.001
Years of education, mean (SD)	12.40 (3.14)	9.79 (3.57)	12.94 (2.58)	<0.001	9.50 (3.56)	12.82 (2.67)	<0.001	11.31 (3.35)	13.40 (2.54)	<0.001	9.42 (3.35)	12.79 (2.76)	<0.001
Smoke Status, N (%)				<0.001			<0.001			<0.001			<0.001
Never	8269 (41.8)	1469 (40.8)	3844 (42.6)		1294 (43.8)	4019 (41.6)		3669 (38.7)	4600 (44.7)		1069 (44.0)	3159 (42.4)	
Former	7813 (39.5)	1505 (41.8)	3996 (44.3)		1140 (38.6)	4361 (45.2)		3787 (39.9)	4026 (39.1)		1009 (41.5)	3405 (45.7)	
Current	3704 (18.7)	623 (17.3)	1175 (13.0)		520 (17.6)	1278 (13.2)		2035 (21.4)	1669 (16.2)		352 (14.5)	883 (11.9)	
Drinking status, N (%)				<0.001			<0.001			<0.001			<0.001
Never	9063 (45.6)	2265 (62.6)	3981 (43.9)		1937 (65.2)	4309 (44.4)		4914 (51.5)	4149 (40.1)		1615 (66.1)	3362 (44.9)	
Ever	10824 (54.4)	1354 (37.4)	5083 (56.1)		1035 (34.8)	5402 (55.6)		4624 (48.4)	6200 (59.9)		829 (33.9)	4125 (55.1)	
Former	3767 (18.9)	492 (13.6)	1634 (18.0)		416 (14.0)	1710 (17.6)		1606 (16.8)	2161 (20.9)		330 (13.5)	1331 (17.8)	
Current	7057 (35.5)	862 (23.8)	3449 (38.1)		619 (20.8)	3692 (38.0)		3018 (31.6)	4039 (39.0)		499 (20.4)	2794 (37.3)	
BMI, mean (SD)	27.34 (5.32)	27.42 (5.21)	26.64 (4.65)	<0.001	27.46 (5.42)	26.69 (4.62)	<0.001	27.81 (5.44)	26.91 (5.17)	<0.001	27.30 (5.05)	26.50 (4.68)	<0.001

Note: BMI=body mass index; SD=standard deviation.

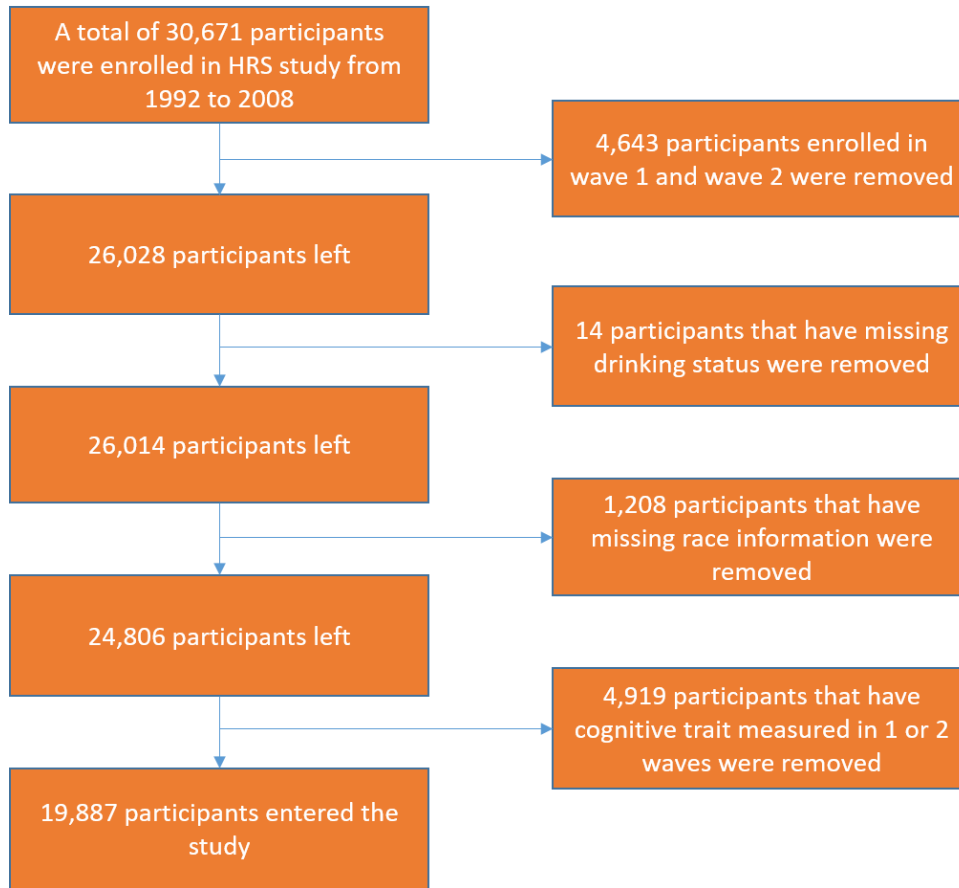
eTable 2. Associations of Drinking Status With Cognition Trajectories in Male and Female HRS Participants

		Male		Female		P _{intx}
		OR (95% CI)	P	OR (95% CI)	P	
TCS						
	Never drinker	-	-	-	-	
	Former drinker	0.81 (0.66 - 0.98)	0.03	0.66 (0.56 - 0.79)	<.0001	0.09
	Low to moderate drinker	0.60 (0.51 - 0.71)	<.0001	0.73 (0.62 - 0.86)	0.0002	0.26
	Heavy drinker	0.74 (0.54 - 1.01)	0.06	1.03 (0.75 - 1.42)	0.86	0.33
MS						
	Never drinker	-	-	-	-	
	Former drinker	0.87 (0.69 - 1.11)	0.27	0.78 (0.66 - 0.93)	0.005	0.30
	Low to moderate drinker	0.61 (0.50 - 0.74)	<.0001	0.77 (0.66 - 0.92)	0.003	0.16
	Heavy drinker	0.74 (0.50 - 1.09)	0.13	0.88 (0.63 - 1.24)	0.48	0.70
WR						
	Never drinker	-	-	-	-	
	Former drinker	0.80 (0.69 - 0.93)	0.003	0.74 (0.67 - 0.83)	<.0001	0.26
	Low to moderate drinker	0.72 (0.64 - 0.81)	<.0001	0.76 (0.68 - 0.84)	<.0001	0.86
	Heavy drinker	1.01 (0.81 - 1.25)	0.93	0.99 (0.81 - 1.21)	0.93	0.53
VOC						
	Never drinker	-	-	-	-	
	Former drinker	0.75 (0.59 - 0.96)	0.02	0.70 (0.57 - 0.85)	0.0004	0.54
	Low to moderate drinker	0.65 (0.54 - 0.80)	<.0001	0.63 (0.51 - 0.76)	<.0001	0.68
	Heavy drinker	0.56 (0.36 - 0.86)	0.01	0.44 (0.27 - 0.72)	0.0009	0.35

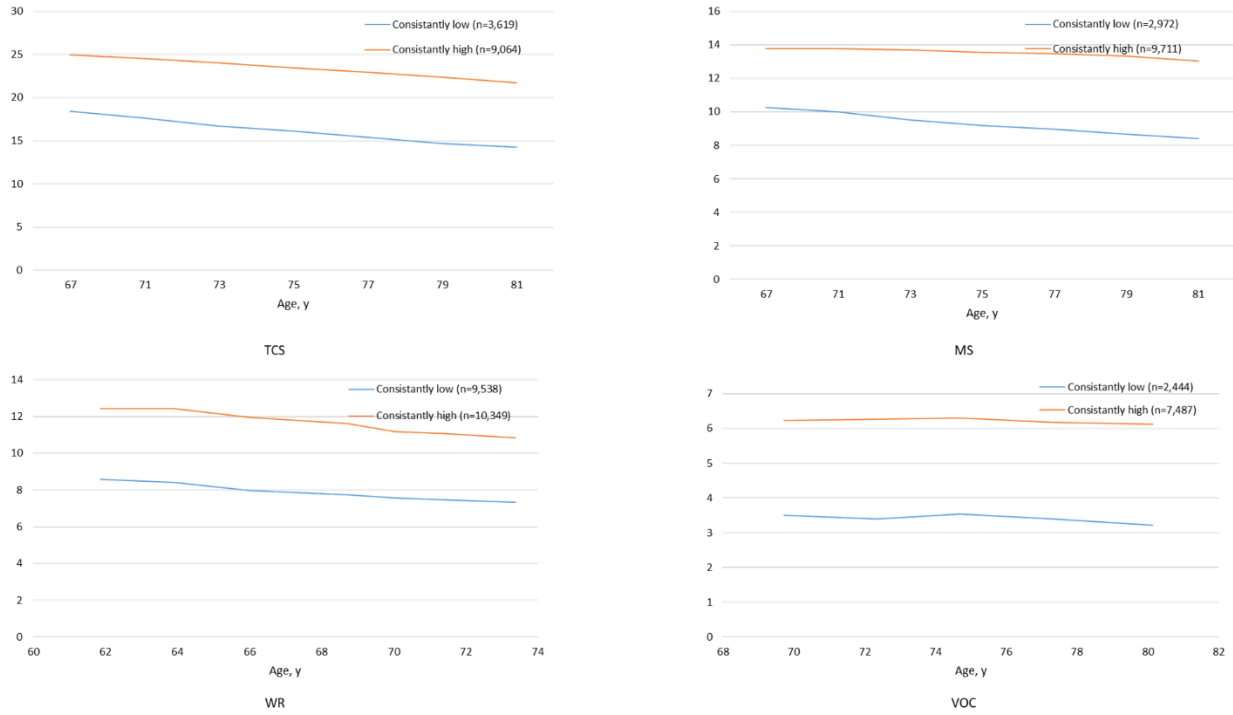
Note: CI=confidence interval; OR=odds ratio; TCS=total cognitive score; MS=mental status; WR=word recall; VOC=vocabulary.

All analyses adjusted for age, gender, race, education, marital status, smoking status, and body mass index.

eFigure 1. Flowchart for Participants Selection and Cohort Construction

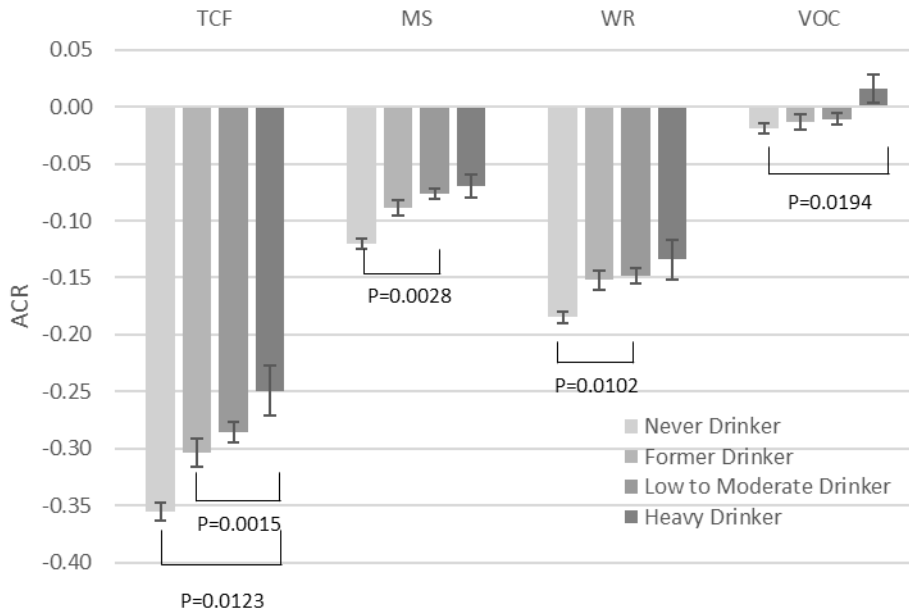


eFigure 2. Cognition Trajectories (Mean Score) for 4 Cognitive Functions



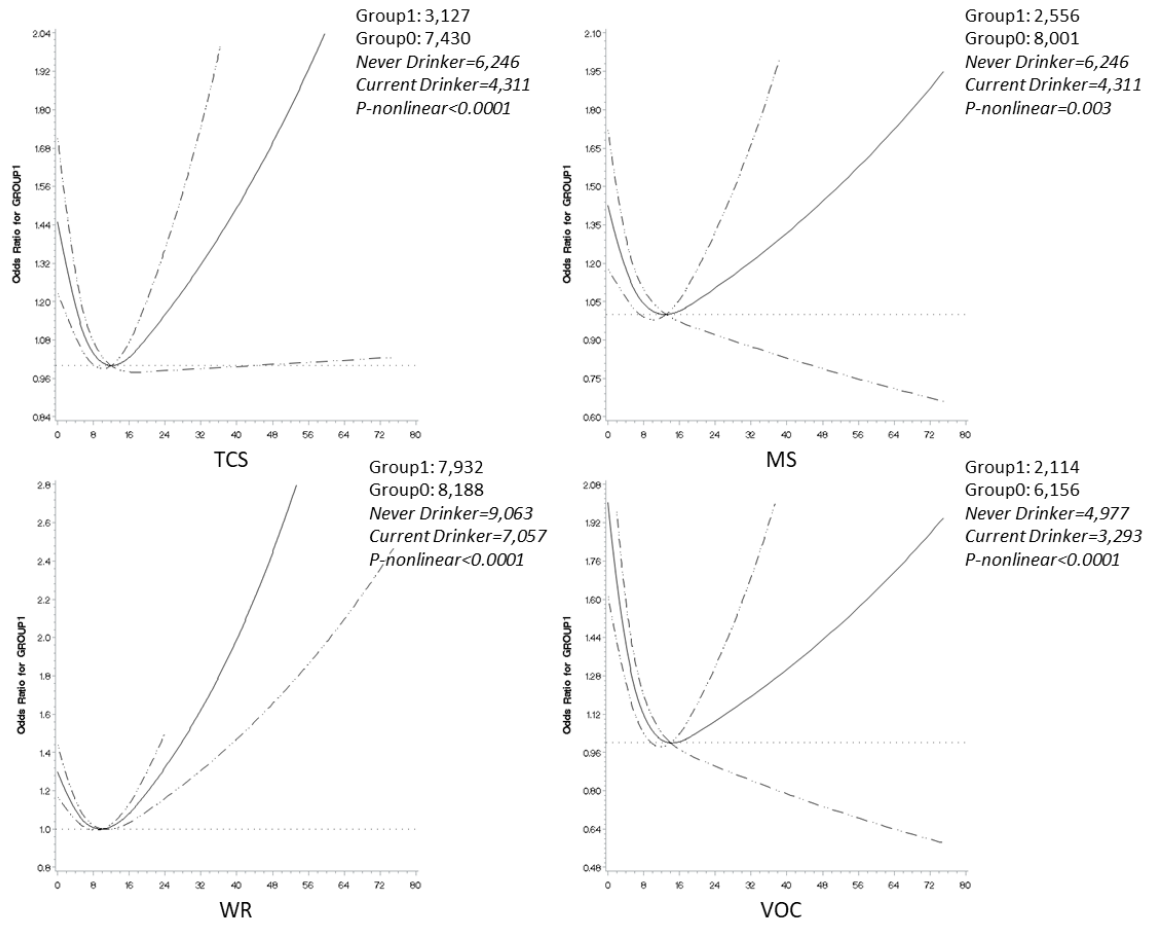
Note: TCS=total cognitive score; MS=mental status; WR=word recall; VOC=vocabulary; Group0=group with high cognitive function trajectory; Group1=group with low cognitive function trajectory.

eFigure 3. Distribution of Annual Changing Rate in Different Drinking Groups



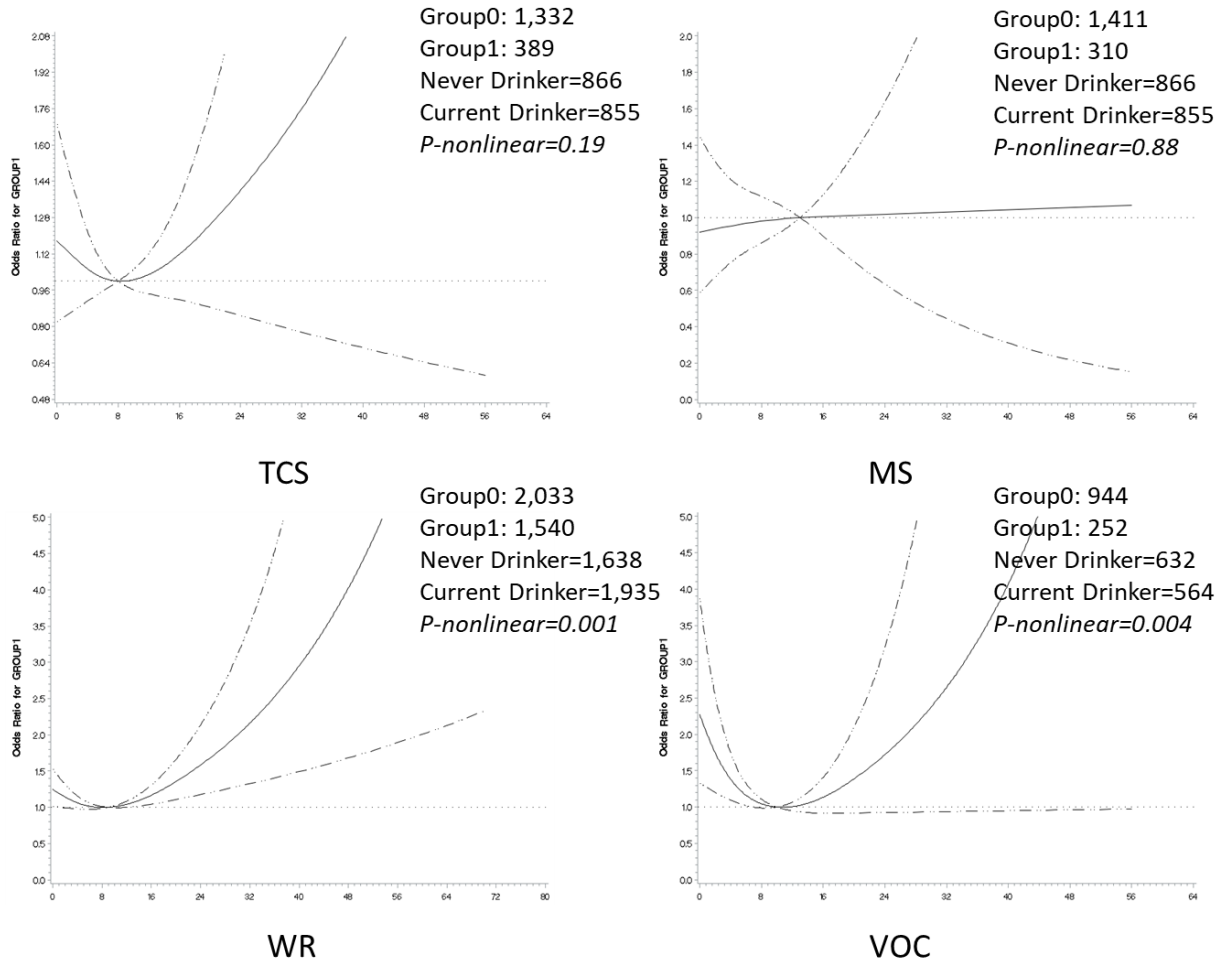
Note: Annual changing rate of TCS is significantly different between never drinker and heaver drinker, and former drinker and heavy drinker; annual changing rate of MS is significantly different between never drinker and low-to-moderate drinker; annual changing rate of WR is significantly different between never drinker and low-to-moderate drinker; annual changing rate of VOC is significantly different between never drinker and heavy drinker

eFigure 4. Nonlinear Relationship Between Weekly Drinking Level and Cognition Trajectory Among Current and Never Drinkers



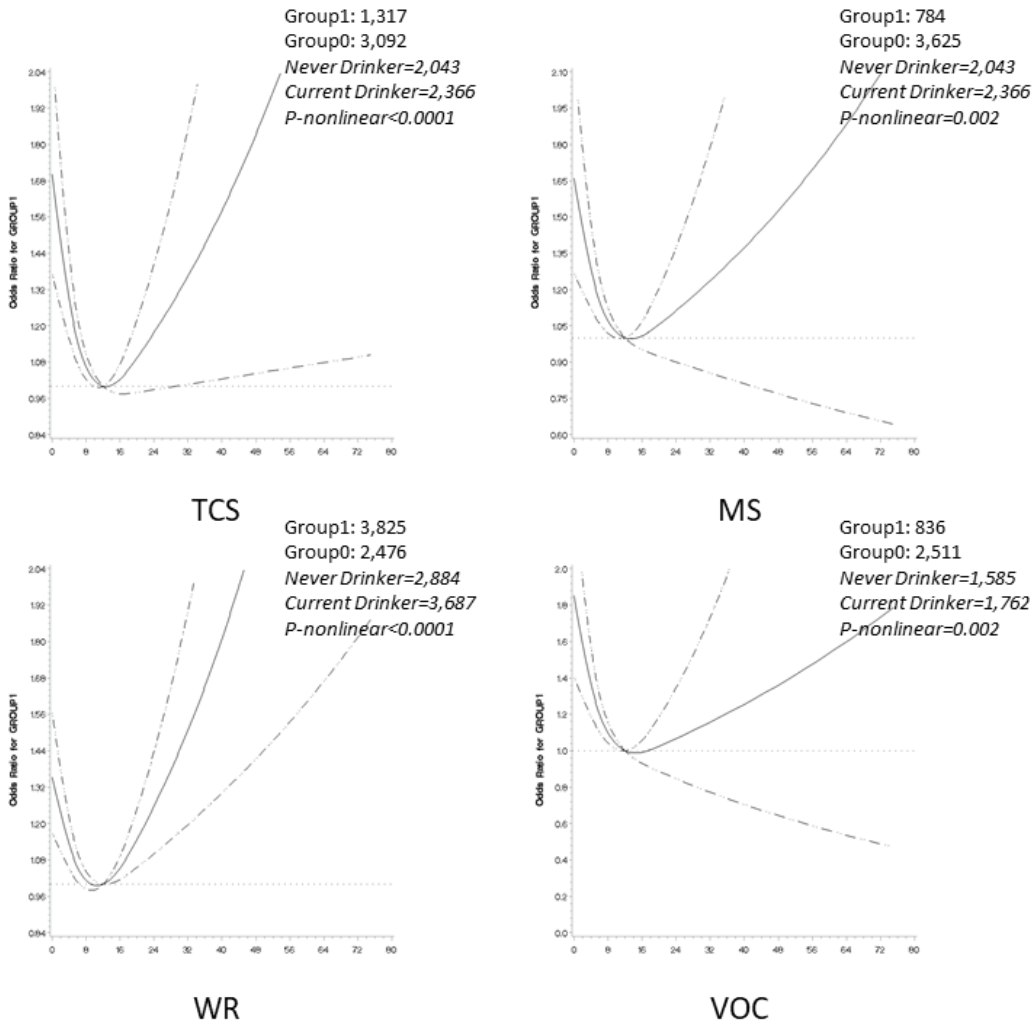
Note: Number of never drinker is 6246, 6246, 9063, and 4977; number of current drinker is 4311, 4311, 7057, and 3293 for TCS, MS, WR, and VOC, respectively.

eFigure 5. Sensitivity Analyses for Nonlinear Relationship Between Weekly Drinking Level and Cognition Trajectory Among Healthy Current and Never Drinkers



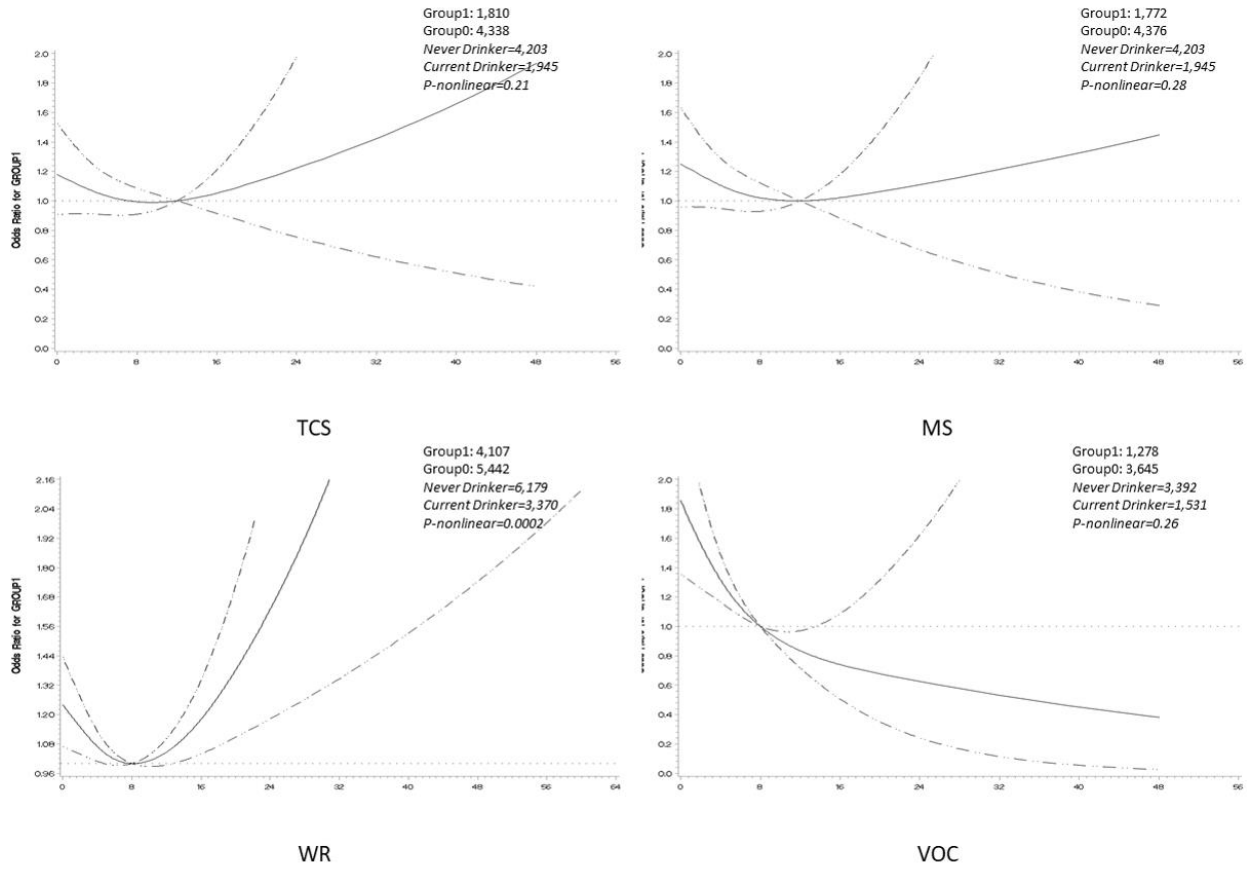
Note: Number of never drinker is 866, 866, 1638, and 632; number of current drinker is 855, 855, 1935, and 564 for TCS, MS, WR, and VOC, respectively.

eFigure 6. Nonlinear Relationship Between Weekly Drinking Level and Cognition Trajectory Among Male Current and Never Drinkers



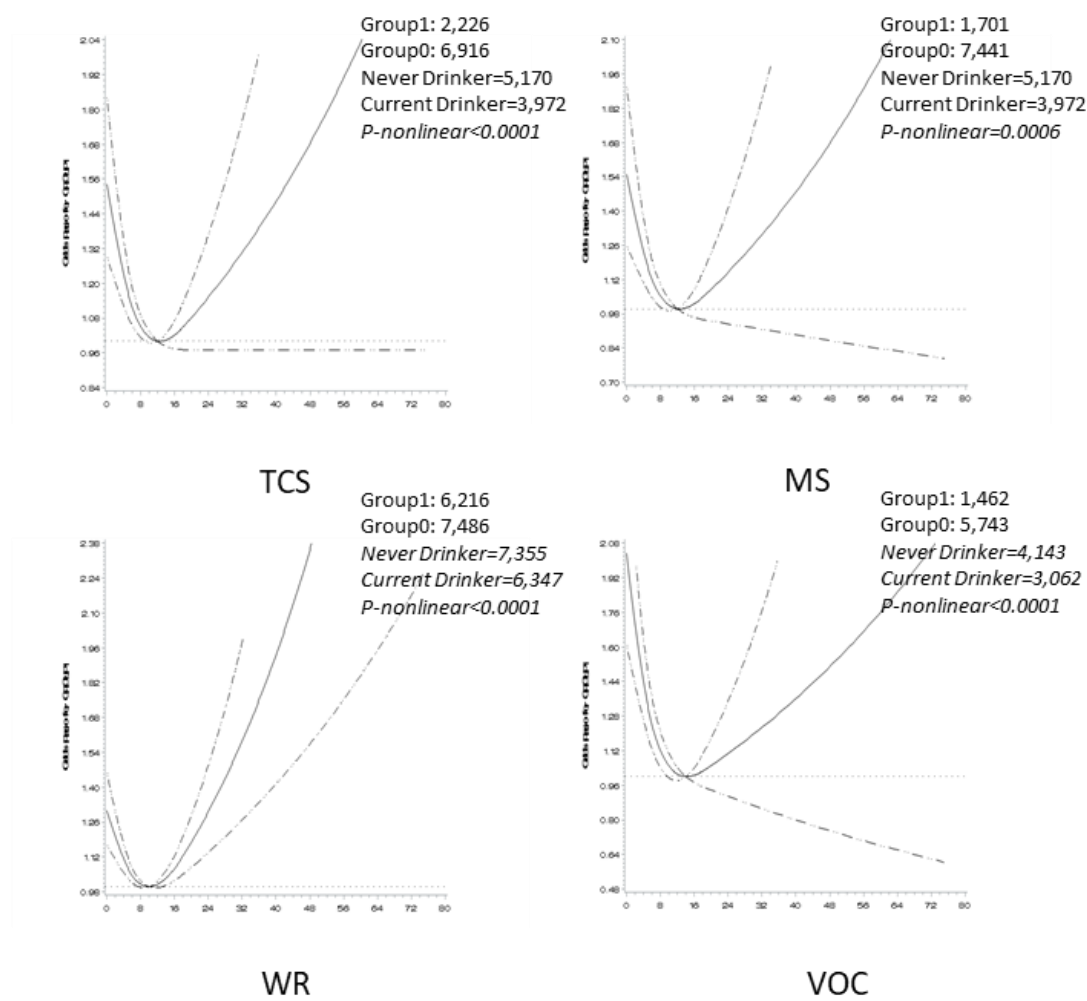
Note: Number of never drinker is 2043, 2043, 2884, and 1585; number of current drinker is 2366, 2366, 3687, and 1762 for TCS, MS, WR, and VOC, respectively.

eFigure 7. Nonlinear Relationship Between Weekly Drinking Level and Cognition Trajectory Among Female Current and Never Drinkers



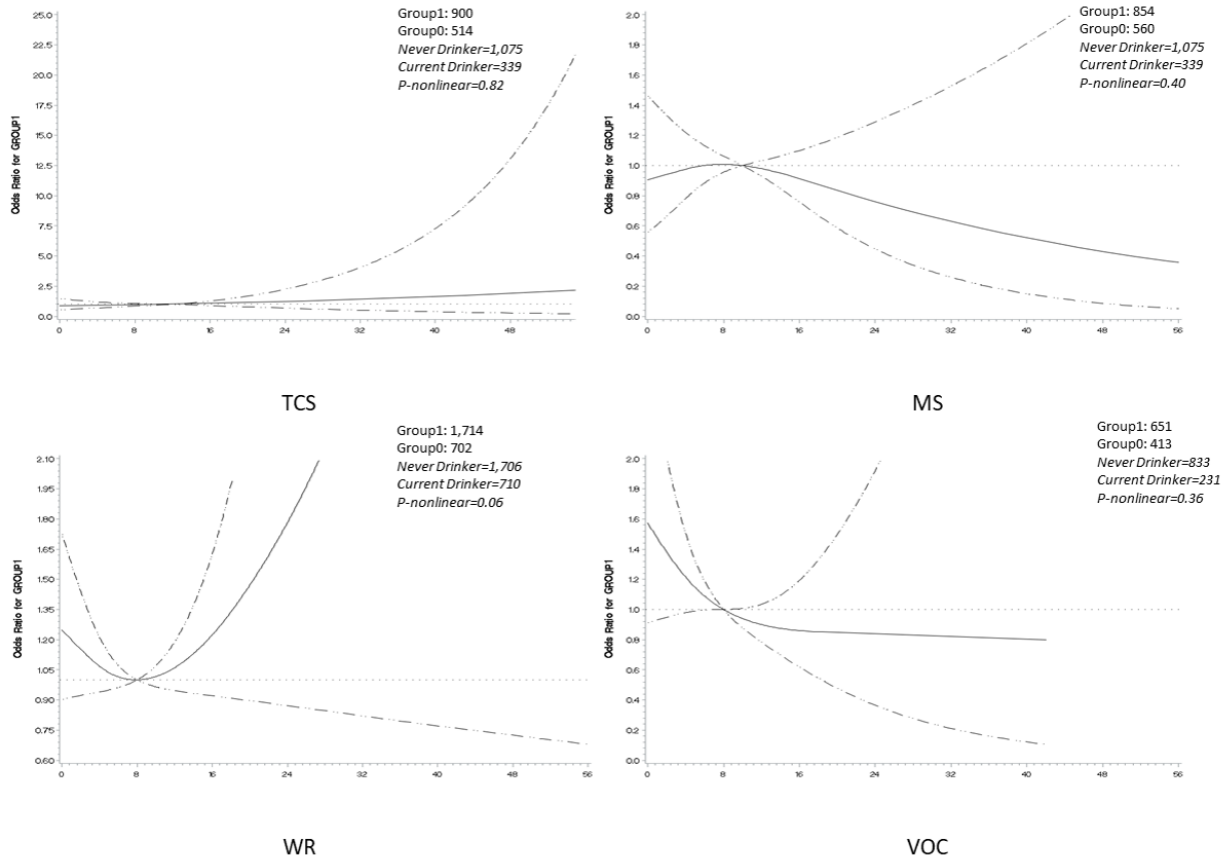
Note: Number of never drinker is 4203, 4203, 6179, and 3392; number of current drinker is 1945, 1945, 3370, and 1531 for TCS, MS, WR, and VOC, respectively.

eFigure 8. Nonlinear Relationship Between Weekly Drinking Level and Cognition Trajectory Among White Current and Never Drinkers



Note: Number of never drinker is 5170, 5170, 7355, and 4143; number of current drinker is 3972, 3972, 6347, and 3062 for TCS, MS, WR, and VOC, respectively.

eFigure 9. Nonlinear Relationship Between Weekly Drinking Level and Cognition Trajectory Among African American (AA) Current and Never Drinkers



Note: Number of never drinker is 1075, 1075, 1706, and 833; number of current drinker is 339, 339, 710, and 231 for TCS, MS, WR, and VOC, respectively.