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## Does genetic variance in drinking motives explain the genetic overlap between personality and alcohol involvement?

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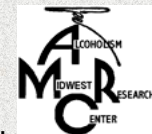
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# DOES GENETIC VARIANCE IN DRINKING MOTIVES EXPLAIN THE GENETIC OVERLAP BETWEEN PERSONALITY AND ALCOHOL INVOLVEMENT?



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## Background

-Genetic risk for alcohol dependence has been shown to overlap with genetic factors contributing to variation in dimensions of personality (Slutske et al., 2002)

-Internal drinking motives (i.e., coping and enhancement) have been posited as important mediators of the alcohol-personality relation (e.g., Cooper et al., 1995) and appear to be heritable (Agrawal et al., 2008; Prescott et al., 2004)

-However, it remains unclear the extent to which genetic variance in drinking motives:

- overlaps with genetic variance in theoretically related personality constructs
- account for the genetic covariance between personality and alcohol involvement

## Current Study

-The current study sought to address two primary research questions

- Do genetic factors contributing to variation in personality also contribute to genetic variation in internal drinking motives?
- If so, does genetic variance in drinking motives explain the genetic overlap between personality and alcohol involvement?

## Method

-Data drawn from Wave 4 of Missouri Adolescent Female Twin Study (MOAFTS); Heath et al., 2002)

- 3,611 young adult same-sex female twins
- Median age = 22, mean age = 21.7, SD = 2.8; range 18-29 years

-Measures

-Alcohol:

- Symptom count of DSM-IV (American Psychiatric Association, 1994) and dependence items (AUD symptoms, log-transformed)
- Quantitative measure of alcohol consumption (Agrawal et al., 2009)

-Personality:

- Conscientiousness, Agreeableness, Neuroticism: NEO Five-Factor Inventory (NEO-FFI; Costa & McCrae, 1989)
- Control: Multidimensional Personality Questionnaire (MPQ; Tellegen, 1982)

-Drinking Motives:

- Coping and enhancement scale from Drinking Motives Questionnaire (Cooper, 1994)

TABLE 1. Phenotypic correlations between alcohol involvement, personality, and drinking motives

	1	2	3	4	5	6	7
1. Alcohol Symptoms							
2. Quantitative Alcohol Composite	0.63						
3. Coping Motives	0.42	0.37					
4. Enhancement Motives	0.37	0.39	0.57				
5. Neuroticism	0.21	0.13	0.35	0.06 <sup>a</sup>			
6. Conscientiousness	-0.21	-0.15	-0.21	-0.13	-0.35		
7. Agreeableness	-0.20	-0.15	-0.22	-0.05	-0.42	0.33	
8. Control	-0.22	-0.21	-0.21	-0.15	-0.14	0.51	0.29

Note. Unless noted otherwise, all estimates significant at  $p < .05$

<sup>a</sup>Statistically non-significant at  $p < .05$

TABLE 2. Genetic correlations between alcohol involvement, personality, and drinking motives

	Alcohol		Coping Motives	Enhancement Motives
	Symptoms	Quantitative Alcohol Composite		
Coping Motives	0.81	0.66		
Enhancement Motives	0.59	0.60		
Neuroticism	0.33	-0.02 <sup>a</sup>	0.67	0.01 <sup>a</sup>
Conscientiousness	-0.39	-0.01 <sup>a</sup>	-0.28	-0.07 <sup>a</sup>
Agreeableness	-0.40	-0.30	-0.53	-0.02 <sup>a</sup>
Control	-0.46	-0.34	-0.36	-0.16

Note. Unless noted otherwise, all estimates significant at  $p < .05$

<sup>a</sup>Statistically non-significant at  $p < .05$

TABLE 3. Genetic correlations between alcohol involvement and personality, adjusting for coping motives

	Alcohol	
	Symptoms	Quantitative Alcohol Composite
Neuroticism	.04 (99%)	-
Conscientiousness	-0.33	-
Agreeableness	-0.25 (61%)	-0.16
Control	-0.39 (28%)	-0.22

Note. R<sup>2</sup> percentage of genetic covariance explained by coping motives shown in parentheses for correlations that were significantly reduced

TABLE 4. Genetic correlations between alcohol involvement and personality, adjusting for enhancement motives

	Alcohol	
	Symptoms	Quantitative Alcohol Composite
Neuroticism	0.34	-
Conscientiousness	-0.42	-
Agreeableness	-0.45	-0.32
Control	-0.44	-0.26

## Analytic Procedure

- Using data from members of identical/monozygotic (MZ) and fraternal/dizygotic (DZ) twin pairs, we are able to partition individual differences in alcohol involvement, personality, and drinking motives into three sources: additive genetic (A), shared environmental (C) and unique environmental (E)

-The extent to which genetic variance in personality overlapped with genetic variance in drinking motives and alcohol involvement was estimated (i.e., genetic correlation)

-The genetic correlation between personality and alcohol involvement, adjusting for drinking motives, was then estimated

-All analyses conducted in Mx Version 1.7.03

## Results

-Significant genetic associations were found between coping motives and all personality constructs whereas enhancement motives showed significant genetic overlap with control only

-- Coping motives demonstrated the largest genetic overlap with all personality and alcohol involvement measures and accounted for, respectively, over 99%, 60%, and 28% of the genetic covariance between neuroticism, agreeableness, and control with AUD symptoms

-Though coping motives reduced the respective relation between agreeableness and control with the alcohol composite, the adjusted estimates were not significantly different from the unadjusted correlations

--Enhancement motives did not significantly reduce the genetic correlations between alcohol involvement and personality

## Conclusions

-Findings suggest that genetic variation in coping motives to drink account for a substantial proportion of the genetic overlap between specific personality dimensions and AUD symptoms

-Future research should further elucidate specific genetic factors that relate to these constructs

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