2019

Evaluation of a new trauma-related drinking to cope measure: Latent structure and heritability

Sage E. Hawn
Virginia Commonwealth University

Steven H. Aggen
Virginia Commonwealth University

Danielle Dick
Virginia Commonwealth University

Ananda B. Amstadter PhD
Virginia Institute for Psychiatric and Behavioral Genetics

Evaluation of a new trauma-related drinking to cope measure: Latent structure and heritability

Hawn, S.E. [a,b], Aggen, S.[b], *Spit for Science Working Group,* Dick, D.[a], & Amstadter, A.B.[a,c]

[a] Department of Psychiatry, Virginia Institute of Psychiatric and Behavioral Genetics; [b] Department of Psychology; [c] Department of Human and Molecular Genetics
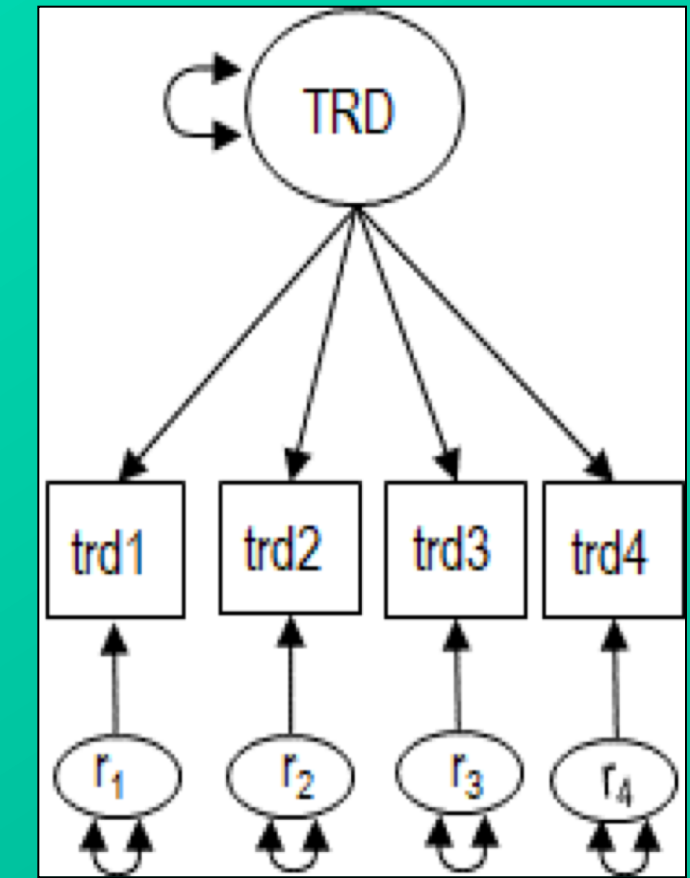
Virginia Commonwealth University

WHAT & WHY?

Posttraumatic stress disorder (PTSD) and alcohol use disorder (AUD) commonly co-occur, share latent genetic risk, and are associated with many negative public health outcomes. Via a self-medication framework, trauma-related drinking to cope (TRD), an unexplored phenotype to date, may help explain why these two disorders co-occur, thus serving as an essential target for treatment and prevention efforts. This study sought to create a novel measure of TRD and to investigate its indirect influences on the association between PTSD and AUD, as well as its potential shared molecular genetic risk with PTSD in a genetically-informative study of college students.

TRAUMA RELATED DRINKING TO COPE (TRD)

How often do you drink alcohol to cope with symptoms including

Almost never/ Never (1)	Some of the time (2)	Half of the time (3)	Most of the time (4)	Almost always/ Always (5)

1) Repeated, disturbing, unwanted memories, dreams, or feelings about the stressful experience?

2) Avoiding memories, thoughts, feelings, or external reminders of the stressful experience?

3) Strong negative beliefs about yourself or the world; feelings of blame, shame, or guilt; loss of interest in activities you used to enjoy; feeling distant or cut off from other people; or trouble experiencing positive feelings?

4) Irritability, anger, risk-taking, alertness, jumpiness, difficulty concentrating, or difficulty sleeping?

WHO?

Life Experiences and Alcohol Use Study
1,896 undergraduate students recruited from Spit for Science (S4S) with a history of trauma and alcohol use provided genotypic data and completed an online assessment battery

M_{age}=19.77, SD=1.75; 70% female; 49.3% White, 20.0% Black, 16.4% Asian, and 14.3% 'Other' (included American Indian/Native Alaskan, Hispanic/Latino, Native Hawaiian/Other Pacific Islander, more than one race, and unknown)

OTHER MEASURES

Measure	Domain
AUDIT	Alcohol consumption and problems
DMQ-R	General coping-related drinking motives
TLEQ	Comprehensive trauma history
PCL-5	DSM-5 PTSD symptoms

IS THERE A COMMON FACTOR OF TRD?

Yes (χ^2(26) = 299.077, p < .001; CFI = .989; TLI = .985; RMSEA = .075), thereby providing support for the use of a TRD common factor in the subsequent validation models.

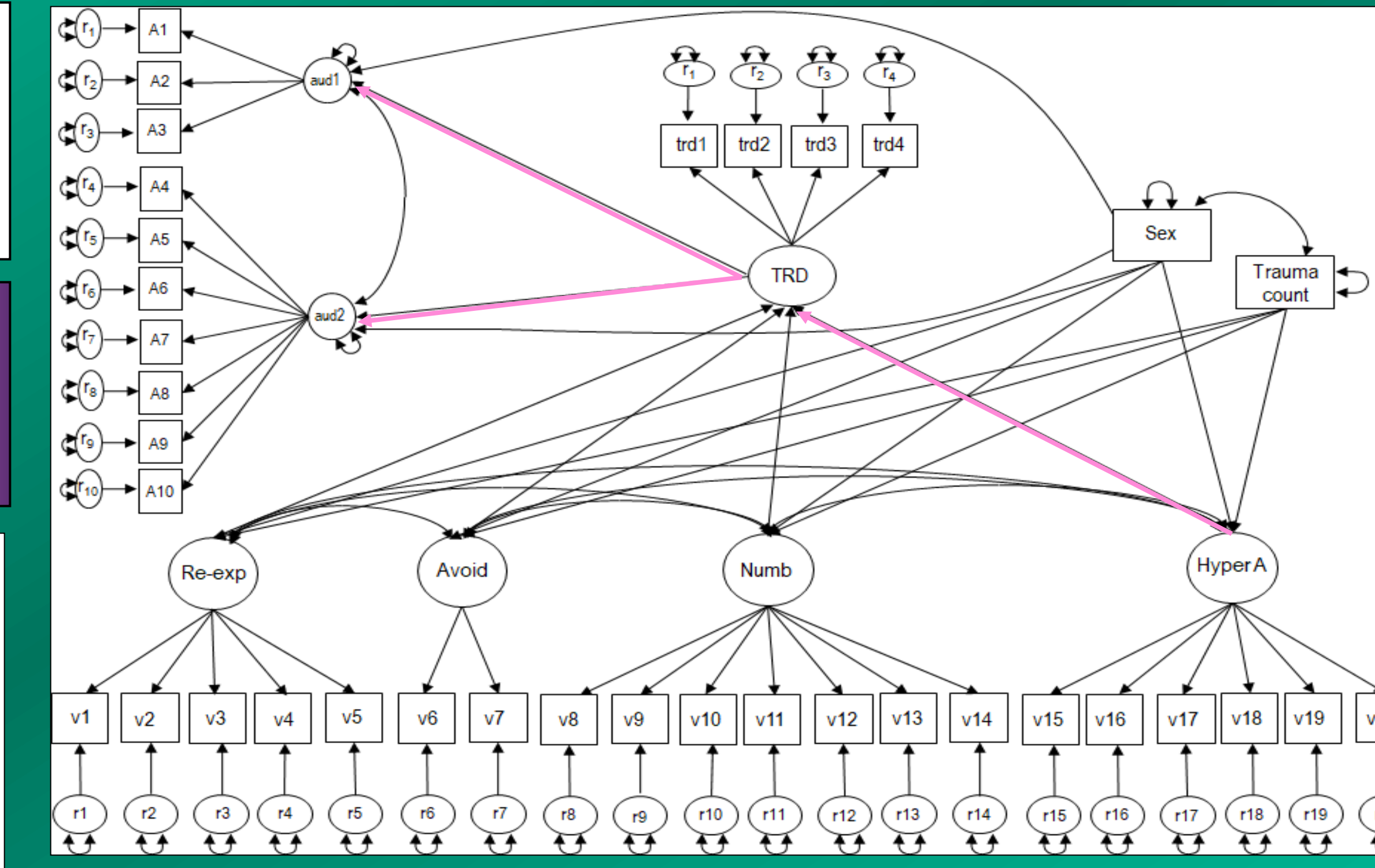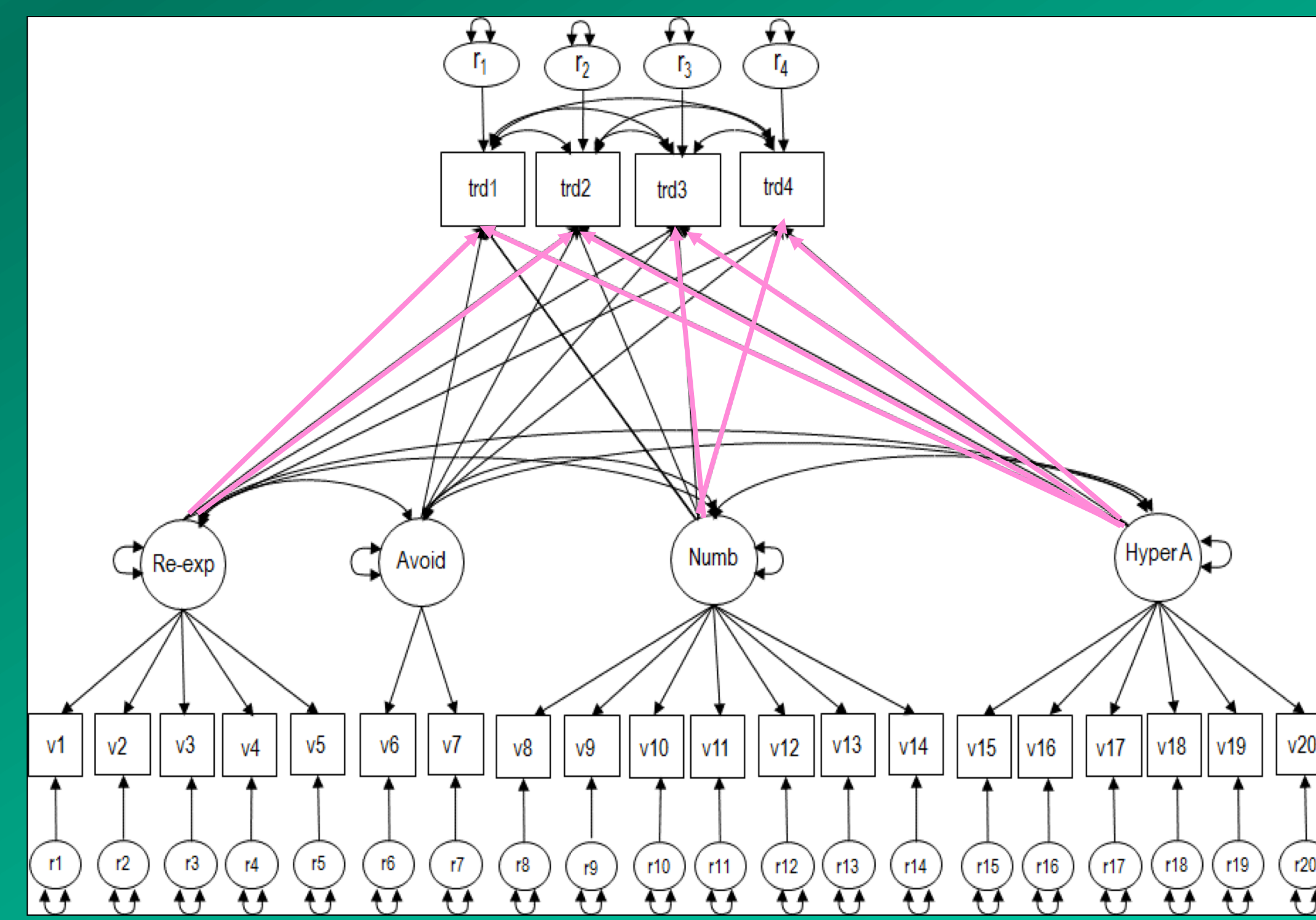## HOW DOES TRD RELATE TO THE COMMONLY USED DMQ-COPE?

The TRD and DMQ-Cope latent factors were correlated (ρ = .757)
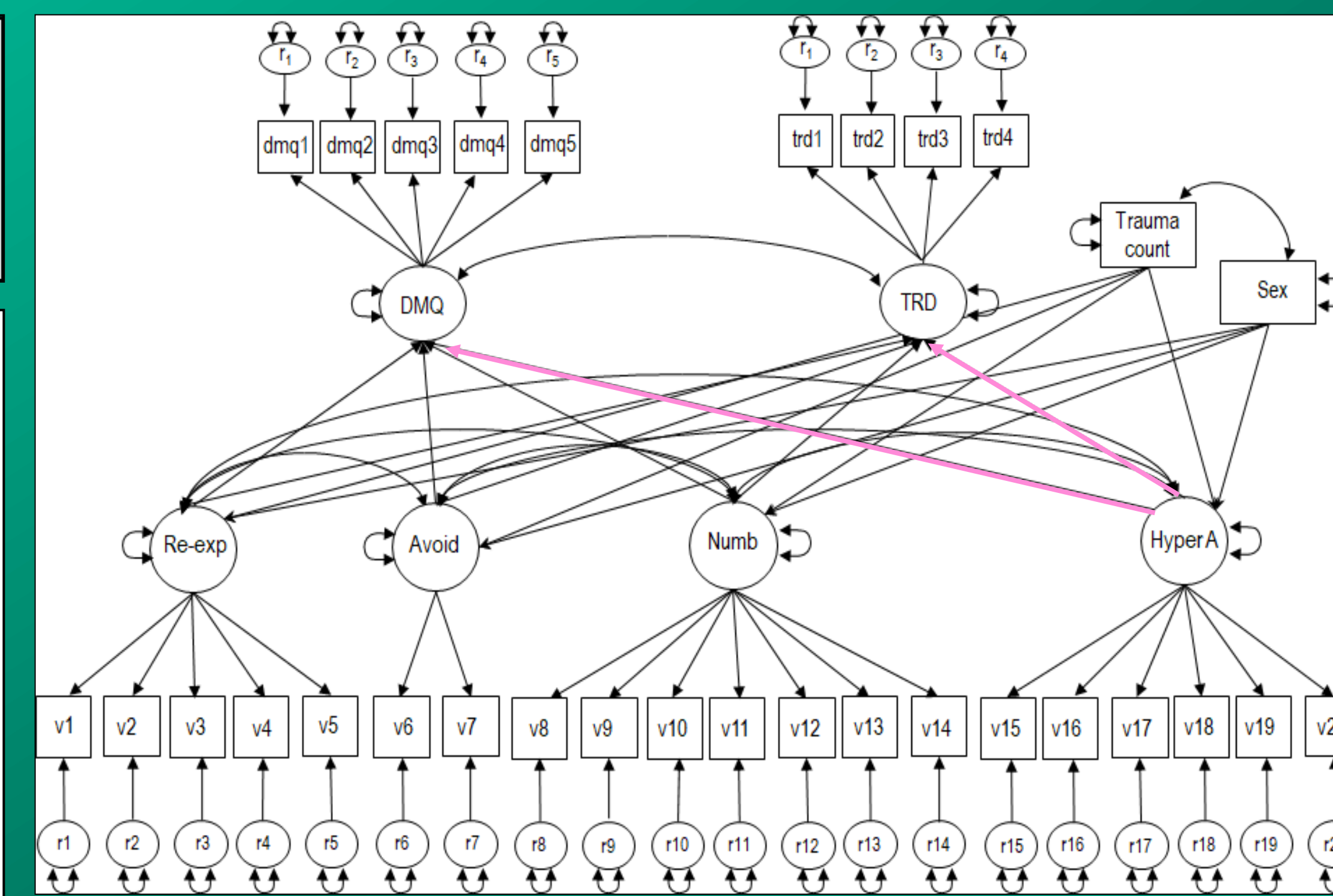
Including TRD and DMQ-Cope in the same model (χ^2(412) = 2984.451, p < .001; CFI = .964; TLI = .960; RMSEA = .058), only the arousal factor of the PCL-5 significantly predicted either common factor, though this prediction was stronger for TRD than DMQ-Cope

Provides support for the use of TRD as more specific measure of drinking to cope in the context of PTSD symptoms compared to DMQ-Cope

HOW WELL DOES EACH TRD ITEM RELATE TO EACH PTSD SYMPTOM CLUSTER?

Overall, each of the four PCL-5 common factors significantly predicted their analogous TRD items (i.e., the intrusion PCL factor predicted the TRD item summarizing intrusion symptoms), with the exception of the avoidance factor, which did not significantly predict any of the four TRD items.

	PCL Factor 1: Intrusion	PCL Factor 2: Avoidance	PCL Factor 3: Cogs/Mood	PCL Factor 4: Arousal
Standardized loading (standard error)				
TRD Intrusion	.419 (.101)***	-.064 (.109)	-.100 (.113)	.356 (.095)***
TRD Avoidance	.195 (.092)*	.155 (.094)	.095 (.096)	.184 (.083)*
TRD Cog/Mood	-.126 (.090)	.010 (.088)	.435 (.090)***	.293 (.082)***
TRD Arousal	-.162 (.102)	.122 (.106)	-.299 (.111)**	.906 (.090)***

HOW DOES TRD RELATE TO ALCOHOL?

The PCL-5 arousal factor alone predicted the TRD common factor. TRD significantly predicted alcohol consumption and related problems while accounting for the effects of the PTSD factors and the covariates of sex and lifetime trauma load.

	PCL 1: Intrusion	PCL 2: Avoidance	PCL 3: Cogs/ Mood	PCL 4: Arousal	AUDIT 1: Consum	AUDIT 2: Cons/Dep
Standardized loading (standard error)						
TRD	-.027 (.124)	.231 (.125)	-.103 (.127)	.773 (.115)***	.192 (.026)***	.449 (.038)***
Sex[#]	.366 (.060)***	.365 (.063)***	.133 (.058)*	.074 (.063)	-.423 (.056)***	-.322 (.069)***
Trauma Load	.182 (.010)***	.187 (.011)***	.167 (.010)***	.186 (.011)***	--	--

IS TRD HERITABLE?

Super-population	Covariates	h²	SE	P-value
AFR	PCs, sex	.012	1.279	.500
AMR	PCs, sex	<.001	1.493	.500
EAS	PCs, sex	.999	3.000	.080
EUR	PCs, sex	.999	0.754	.050
SAS	PCs, sex	.999	3.029	.100

Phenotype	h2 (SE)	rg with TRD (SE)	P-value
TRD	0.704 (1.423)		
PGC PTSD	0.061 (0.012)	-0.343 (0.515)	.505
PGC AUD	0.143 (0.046)	0.039 (0.570)	.945

WHO CARES?

Findings show support for the use of TRD as a more refined screener of trauma-related coping drinking motives compared to the current gold-standard, DMQ-Cope and that TRD could serve as a useful tool for understanding and possibly disrupting the self-medication process.

WHY MIGHT THIS SUCK?

Limitations include lack of evidence for external validation of the TRD avoidance factor and high correlations between the PCL-5 and AUDIT factors. Genetic analyses were extremely underpowered and therefore uninterpretable.