Disinhibition- A Neurobehavioral Trait Underlying the Relationship Between Social Anxiety & Alcohol Use

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Introduction

- **Social anxiety** (SA) & **alcohol use** (AU) are prevalent and often comorbid, leading to increased symptom severity & poorer treatment outcomes (Buckner et al., 2008). However, findings are mixed.
- The moderating influence of multifaceted traits such as **disinhibition** (Mullins-Sweatt et al., 2019) on this relationship may help clarify predispositions to psychopathology (Carlson, Johnson, & Jacobs, 2010).
- Further different facets of disinhibition may have varying influences:
  - **Impulsivity** (IMP): tendency to behave with rashness, high novelty seeking, and lack of foresight (Nicholls et al., 2014).
  - **Risk-taking** (RT): making choices with uncertain outcomes & balancing potential harm with reward (Kashdan et al., 2008).
  - **Rigid perfectionism** (RP): desire for flawlessness and exceedingly high expectations for performance (Egan et al., 2011).
  - High IMP and RT may provide a way to escape anxiety and acute self-awareness, thus serving as a potential risk factor for AU (Kashdan & Hofmann, 2008).
  - High RP plus low IMP and RT may yield over-regulated behaviors that protect against AU (Lipton et al., 2016).
  - Additional nuanced patterns of AU vary across age groups dependent upon US legal drinking age.

Current Study

We assessed unique and interactive contributions of facets of disinhibition – impulsivity, risk-taking, & rigid perfectionism – to the relationship between dimensional SA and AU within two age groups.

Methods & Analyses

Participants

- 474 college adults, split into two age groups: below legal drinking age (<21; N = 295, 46.8% female; M_{age} = 18.8, SD = 0.755 years); above legal drinking age (>21; N = 164, 43.1% female; M_{age} = 24.1, SD = 4.9 years)

Measures

- Inventory of Depression & Anxiety – Expanded (IDAS-II; Watson et al., 2012)
  - Social Anxiety scale *(e.g., "I was worried about embarrassing myself socially")*
- Michigan Alcohol Screening Test (MAST; James & Bruce, 1984)
  - Self-report Alcohol Use *(e.g., "Can you stop drinking without difficulty after one or two drinks?")*
- Personality Inventory for DSM-5 (PID-5; Krueger et al., 2013)
  - Impulsivity scale *(e.g., "I feel like I act totally on impulse.")*
  - Risk-taking scale *(e.g., "I do a lot of things that others consider risky.")*
  - Rigid Perfectionism scale *(e.g., "If something I do isn't absolutely perfect, it's simply not acceptable.")*

Analyses

- Bivariate analyses were used in each age group to examine associations between dimensional social anxiety, facets of disinhibition (i.e., impulsivity, risk-taking, rigid perfectionism), and severity of alcohol use.
- Multivariate analyses were used to determine unique and interactive contribution of different facets of disinhibition to the relationship between social anxiety and alcohol use, across two age groups.

Results

Bivariate Correlations

Table 1: Bivariate Correlations for Under 21 Age Group

	Age	Sex	Race	SA	IMP	RT	RP	AU
Age	—							
Sex	-0.03	—						
Race	-0.06	0.03	—					
SA	-0.07	0.15**	-0.07	—				
IMP	-0.01	-0.01	0.03	0.28***	—			
RT	0.03	-0.12*	0.02	0.23***	0.57***	—		
RP	0.01	0.04	-0.03	0.31***	0.28***	0.2***	—	
AU	0.02	-0.07	-0.08	0.11	0.16**	0.2***	0.09	—

*note: * p < .05, ** p < .01, *** p < .001*

Table 2: Bivariate Correlations for Above 21 Age Group

	Age	Sex	Race	SA	IMP	RT	RP	AU
Age	—							
Sex	0.07	—						
Race	-0.11	0.1	—					
SA	-0.14	0.12	0.02	—				
IMP	-0.02	-0.02	-0.02	0.24**	—			
RT	-0.07	-0.27***	-0.05	0.08	0.57***	—		
RP	-0.15	0.15	-0.01	0.22**	0.1	0.08	—	
AU	0.02	-0.16*	-0.11	0.09	0.19*	0.1	0.07	—

Regression Analyses

UNDER 21 YEARS OLD

Table 3: IMP + AU (<21)

	β	t	*p*	R	R^2
Step 1					
age	0.01	0.18	0.86	0.1	0.01
sex	-0.06	-1.1	0.27		
race	-0.08	-1.33	0.19		
Step 2					
age	0.02	0.3	0.76	0.2	0.04
sex	-0.08	-1.28	0.2		
race	-0.08	-1.29	0.2		
SA	0.08	1.3	0.19		
IMP	0.13	2.23	0.03		
Step 3					
age	0.02	0.32	0.75	0.2	0.04
sex	-0.08	-1.29	0.2		
race	-0.07	-1.23	0.21		
SA	0.12	1.05	0.29		
IMP	0.19	1.31	0.2		
SA x IMP	-0.08	-0.42	0.68		

Table 5: RT + AU (<21)

	β	t	*p*	R	R^2
Step 1					
age	0.01	0.18	0.86	0.1	0.01
sex	-0.06	-1.1	0.27		
race	-0.08	-1.33	0.19		
Step 2					
age	0.01	0.18	0.86	0.25	0.06
sex	-0.05	-0.86	0.39		
race	-0.08	-1.35	0.18		
SA	0.07	1.14	0.26		
RT	0.2	3.32	0.001		
Step 3					
age	0.01	0.17	0.87	0.25	0.06
sex	-0.05	-0.88	-0.38		
race	-0.08	-1.36	0.17		
SA	0.03	0.25	0.8		
RT	0.15	1.09	0.28		
SA x RT	0.07	0.37	0.71		

Table 7: RP + AU (<21)

	β	t	*p*	R	R^2
Step 1					
age	0.01	0.18	0.86	0.1	0.01
sex	-0.06	-1.1	0.27		
race	-0.08	-1.33	0.19		
Step 2					
age	0.02	0.29	0.77	0.17	0.03
sex	-0.08	-1.4	0.16		
race	-0.07	-1.26	0.25		
SA	0.1	1.61	0.11		
RP	0.06	1.03	0.31		
Step 3					
age	0.02	0.34	0.73	0.18	0.03
sex	-0.08	-1.34	0.19		
race	-0.07	-1.13	0.26		
SA	0.22	1.9	0.06		
RP	0.21	1.56	0.12		
SA x RP	-0.23	-1.23	0.22		

ABOVE 21 YEARS OLD

Table 4: IMP + AU (>21)

	β	t	*p*	R	R^2
Step 1					
age	0.03	0.32	0.75	0.12	0.04
sex	-0.15	-1.89	0.06		
race	-0.1	-1.23	0.22		
Step 2					
age	0.04	0.53	0.6	0.28	0.08
sex	-0.16	-2.04	-0.04		
race	-0.09	-1.18	0.24		
SA	0.08	1	0.32		
IMP	0.17	2.14	0.03		
Step 3					
age	0.05	0.69	0.49	0.31	0.1
sex	-0.15	-1.95	0.05		
race	-0.09	-1.1	0.27		
SA	0.27	1.98	0.05		
IMP	0.47	2.47	0.02		
SA x IMP	-0.41	-1.73	0.09		

Table 6: RT + AU (>21)

	β	t	*p*	R	R^2
Step 1					
age	0.03	0.32	0.75	0.19	0.04
sex	-0.15	-1.89	0.06		
race	-0.1	-1.23	0.22		
Step 2					
age	0.05	0.59	0.55	0.23	0.05
sex	-0.16	-1.87	0.06		
race	-0.1	-1.2	0.22		
SA	0.12	1.48	0.14		
RT	0.05	0.58	0.56		
Step 3					
age	-0.04	0.53	0.6	0.26	0.07
sex	-0.15	-1.77	0.08		
race	-0.11	-1.33	0.19		
SA	0.32	2.13	0.04		
RT	0.34	1.68	0.09		
SA x RT	-0.39	-1.58	0.12		

Table 8: RP + AU (>21)

	β	t	*p*	R	R^2
Step 1					
age	0.03	0.32	0.75	0.19	0.04
sex	-0.15	-1.89	0.06		
race	-0.1	-1.23	0.22		
Step 2					
age	0.06	0.69	0.49	0.24	0.06
sex	-0.18	-2.2	0.03		
race	-0.1	-1.2	0.23		
SA	0.11	1.35	0.18		
RP	0.08	0.92	0.36		
Step 3					
age	0.06	0.68	0.5	0.24	0.06
sex	-0.8	-2.24	0.03		
race	-0.09	-1.17	0.25		
SA	0.02	0.15	0.88		
RP	-0.04	-0.21	0.83		
SA x RP	0.17	0.68	0.5		

Discussion

Bivariate analyses

- SA was strongly, positively associated with all disinhibition facets in the younger group.
- SA was moderately associated with impulsivity & rigid perfectionism, but not risk-taking, in the older group.
- For the younger group, impulsivity and risk-taking were strongly, positively associated with AU; for the older group, only impulsivity was associated (and weakly) with AU.

Multivariate analyses

- Across both age groups, all three facets of disinhibition independently predicted alcohol use. SA did not independently predict AU in either age group.
- No hypothesized interactions were significant.

Potential explanations

- Age appears to heavily influence patterns of AU.
- High trait disinhibition may be an independent predictor of SA, which aligns with prior findings.
- Nonsignificant findings with negligible effect sizes are often seen as undesirable outcomes.
  - However, they can yield important insight into the validity of theories or methods.
  - Our findings do not align with suggestions that SA contributes to patterns of alcohol use.

Limitations

- The sample was split into two age groups, but it still comprises undergraduates, and thus may not accurately reflect typical adult AU patterns.
- Our reliance on self-report measures administered in an online format increased the risk for biased or inaccurate responses due to misunderstanding, careless error, social desirability, or other factors.

Future Directions

- Future studies of SA should take into account neurobehavioral constructs (i.e., self-regulatory strength models) in efforts to better understand associations between SA and trait disinhibition.
- Using a larger, more representative sample could better capture significant interactions between SA, disinhibition, and AU.
- Operationalizing additional constructs (e.g. motivation, coping, expectancy strategies) could help disentangle the complex relationship between SA & AU.

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