Online versions of self-control tasks DID track longitudinal cognitive changes in binge drinkers, but DID NOT differentiate binge drinkers from

Longitudinal cognitive control performance in binge drinkers measured via remote online assessment

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BACKGROUND

- Compared to healthy controls, both binge and heavy drinkers are typified by impulsive decision-making and impaired cognitive control.
- The current study examined the reliability and validity of using online measures of cognitive control (Stop-signal Task, Delay Discounting Task) to identify deficits associated with binge drinking and tracking these effects longitudinally to examine their relationship to alcohol-related harms and changes in use behaviour.

METHODS

1. *N* = 131; completed measures of Alcohol use (AUDIT, AUQ, ASSIST, TLFB), cognitive control (stop-signal, DDT) and mood: anxiety (GAD-7), depression (PHQ-9), via web-based platform programmed in HTML (v5) and JavaScript.
2. The mean duration between baseline and follow-up was 350 days (SD 202.2, range 86-641).
3. Binge (n= 43; AUQ_Binge Score 32.9, AUDIT 12.4) and non-binge drinker groups were determined using the binge drinking criteria from (López-Caneda et al., 2012).

RESULTS

- a significant decline in binge drinking over the period of observation (no moderation by group), e.g., the Binge groups' AUQ-Binge (T1: 29.8, T2: 25.7) and AUDIT scores (T1: 12.4, T2: 9.3) both declined significantly.
- SSRT performance by group across time showed no significant main effect of group (*p* = .34) or interaction effect (*p* = .55), but did show a time effect (p = .02)
- DDT performance showed no group effect, but both time (p = .008) and interaction effects (p = .04) were significant, wherein binge drinkers' discounting rate increased from T1 to T2.
- Consistent with Paz et al. (2018) analysis approach to within participant change, participants with a positive or negative change in AUQ Binge score > 1 were compared, demonstrating a positive relationship between decreased binge drinking and improved cognitive control on both the SST and DDT.

DISCUSSION

- Consistent with recent mixed findings from laboratory-based self-control tasks in community samples (Carbia et al., 2018, Yiu et al., 2019), online versions of the Stop-signal and Delay Discounting tasks did not differentiate binge drinkers from a control group across two timepoints.
- The tasks, particularly the Delay Discounting Task, did show a level of within-participant sensitivity to change in binge drinking behavior, with decreases in bingeing resulting in improved cognition.
- Given the high level of test-retest reliability of the tasks (in control participants), increased frequency of testing and online real-time feedback may be opportunities to increase the sensitivity of our approach, particularly for the purposes of augmenting online interventions for binge drinking (c.f., Jones et al., 2018).

	Binge [a]		Non-binge [b]		Total [c]	
	M	SD	M	SD	M	SD
Age	21.10	5.53	25.06	8.55	23.63	7.80
Age range	17–40		17–50		17–50	
Gender (F:M)	22:10		86:15		108:25	
Years of education	14.00	1.41	15.51	2.60	14.96	2.35
ASSIST 2.0	27.90	21.61	15.43	15.56	19.95	18.84
FTND	0.59	1.99	0.19	0.96	0.34	1.44
PHQ-9	5.69	4.83	4.69	3.91	5.05	4.26
GAD-7	4.38	5.17	4.02	4.01	4.15	4.44
AUDIT	12.28	3.34	6.41	3.88	8.54	4.64
AUQ	60.49	82.52	21.76	17.21	35.80	54.33
AUQ-BS	29.87	16.10	14.94	12.72	20.35	15.70

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