Sign-Tracking and Alcohol Consumption: A New Translational, Computerized Task Assessing Individual Differences in Humans

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Background

Individuals differ in their **tendency to assign motivational value to reward-predictive cues**. In animal studies (autoshaping), two phenotypes are identified:

"Sign-trackers" (STs), which approach and interact with the reward-predictive cue, and **"goal-trackers" (GTs)**, who are preferentially attracted by the reward-delivery location. Other individuals develop an intermediate profile.

The **ST** phenotype has been linked to **addiction vulnerability**.
There has been an increasing interest in **translating this model in humans,** but studies are heterogeneous.

The aim of this study was **to validate a new translational, computerized task to identify human STs and GTs and investigate the link with alcohol consumption.**

Methods

N=97
F= 66, M=30, X=1
Mean age= 22

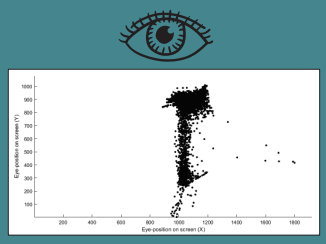


Figure 2. Example of eye-gaze data during the task, from which ST, GT and INT profiles were computed.

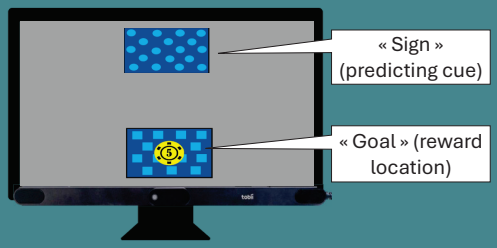
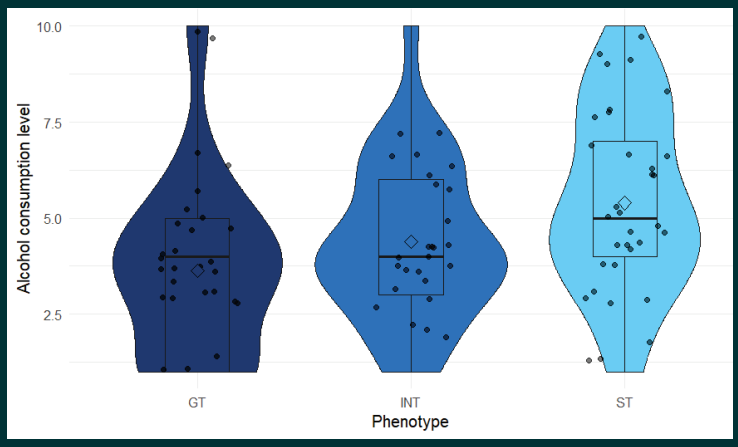


Figure 1. Visual representation of the Sign-tracking task.

Self-reported scales:
Alcohol use (AUDIT)
Alcohol sensitivity (ASQ)
Compulsivity-related problems (BATCAP)
Reward sensitivity (RST-PQ)

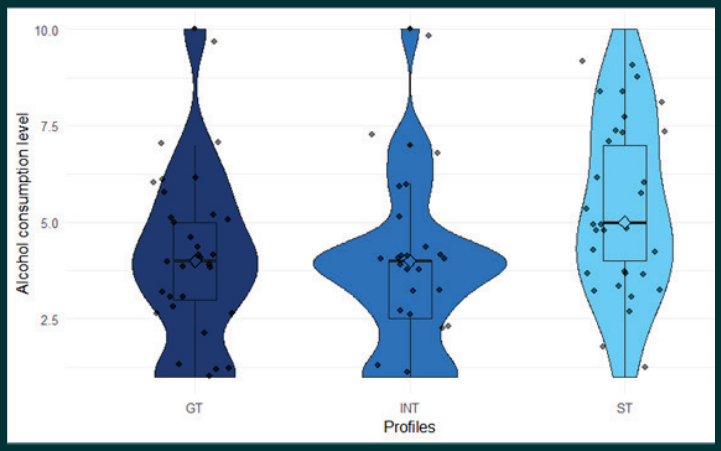
Results

Figure 3. Alcohol consumption level for STs, GTs, and INTs (profiles based on response bias score)



Kruskal-Wallis test : ($\chi2$ = 9.17, p=0.01, $\eta2$(H)= 0.08, 95% CI= [-0.08, 0.16]).
Post-hoc pairwise Wilcoxon tests (B-H correction): significant difference only observed between STs and GTs (p=0.01).

Figure 4. Alcohol consumption level for STs, GTs, and INTs (profiles based on LPA, gaze duration toward sign, goal or in-between zones)



Kruskal-Wallis test : ($\chi2$ = 8.55, p=0.01, $\eta2$(H)= 0.07, 95% CI= [-0.08, .14]).
Post-hoc pairwise Wilcoxon tests (B-H correction): significant differences between STs vs. GTs (p=0.03) and STs vs. INTs (p=0.02), but not between GTs vs. INTs (p=0.61)

Take Home Message

The task **successfully identified STs, GTs and INTs in humans**. These profiles had **divergent levels of alcohol consumption**, supporting the idea that sign-tracking could be related to alcohol consumption in humans, and thus be a **relevant translational model** to identify potentially vulnerable subgroups.

CONTACT FOR FURTHER INFORMATION?

Preprint (early access request)

Want to know more?

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