

Effects of Acute Tobacco Abstinence on Gambling Craving and Behaviour in Electronic Gaming Machine Gamblers who Smoke



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Introduction

- Smoking and gambling are two addictions that have been shown to frequently co-occur, particularly in individuals with gambling disorder (McGrath & Barrett, 2009)
- By applying research from the nicotine withdrawal literature, we can further understand this relationship by examining what happens to one addiction (gambling) in the absence of the other (smoking).
- Nicotine withdrawal is associated with increased impulsivity, elevated risk-taking, and the presence of anhedonia, which is an inability to experience pleasure. Nicotine dependency may also alter the rewards pathway of the brain such that without it, rewards are not processed as effectively. This contributes to the experience of anhedonia. (Dawkins, Acaster, & Powell, 2007)

Research Question & Hypotheses

What is the effect of nicotine withdrawal on mood, cravings, and gambling behaviours in gamblers who smoke?

- H1:** Craving for nicotine will be augmented in the abstinent condition
- H2:** Craving for gambling will be reduced in the abstinent condition
- H3:** Heart rate will be lower in the abstinent condition
- H4:** Performance on the Cambridge Gambling Task (CGT) will be reduced by tobacco withdrawal
- H5:** Gambling behavior will be altered (e.g., spend less money and time gambling) in the abstinent condition

Participants

- Participants were 21 (19 males, 2 females) daily smokers who were also regular VLT gamblers, aged 20-61. 14 were classified as disordered gamblers and 7 as non-disordered gamblers.
- Included if: FTND scores > 3, played on a VLT at least once per month for the last 3 months
- Excluded if: colour blind, FTND scores ≤ 2, trying to quit smoking or gambling, have tried to quit gambling in the past
- They participated in two separate lab sessions: abstinent (refrained from smoking for 12 hours) and satiated (smoked 15 minutes prior to session)
 - Received \$30 gift card for each session
 - Procedure was the same for each condition

Measures

Physiological measures:

- Heart rate and blood pressure
- Smokerlyzer to ensure abstinence/satiation from smoking
- Alcohol breathalyzer to ensure abstinence from drinking

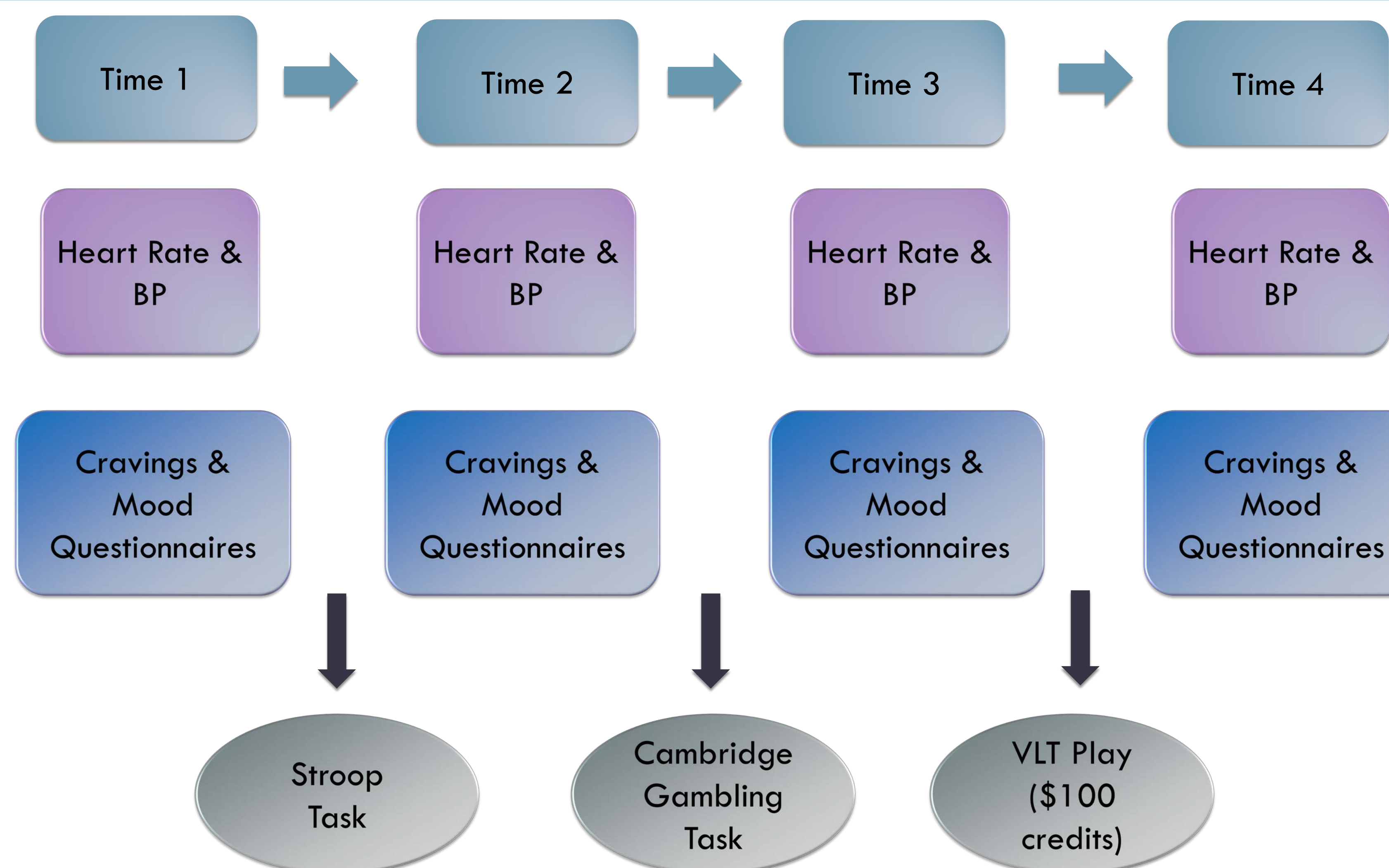
Craving and mood questionnaires:

- Mood and Physical Symptoms Scale (MPSS)
- Visual Analogue Scale (VAS)
- Gambling Craving Scale (GACS)
- Questionnaire of Smoking Urges-Brief (QSU-B)

Cognitive and gambling tasks:

- Stroop task (assesses attentional biases)
- Cambridge Gambling Task (measures risk-taking)
- \$100 of play on VLT (to examine betting behaviours)

Procedure



Results

- H1:**
 - QSU-B Factor 1 (Desire to Smoke): significant interaction between pharmacology and time, $F(3, 60) = 9.59, p < 0.01$. Desire to smoke increased significantly from T2 to T3 in the satiated group only.
 - QSU-B Factor 2 (Withdrawal Relief): significant main effect of pharmacology with higher average scores in the abstinent condition ($M = 27.6, SE = 1.31$) compared to the satiated condition ($M = 18.95, SE = 1.75$), $F(1, 20) = 27.83, p < 0.01$. There was also a significant main effect of time, $F(3, 57) = 7.05, p < 0.01$. Scores were significantly higher in T4 compared to all other time points.
- H2:**
 - GACS: there were no significant differences between abstinent and satiated conditions on any of the factors of the GACS, $ps > .05$.
- H3:**
 - Heart Rate: significant main effect of pharmacology [$F(1, 19) = 5.54, p < 0.01$] and time [$F(3, 57) = 8.49, p < 0.01$]. Heart rate was higher in the satiated group ($M = 79.65, SE = 2.78$) and abstinent group ($M = 72.91, SE = 3.24$). Heart rate significantly decreased from T1 to all other time points.
- H4:**
 - CGT: There were no significant differences between the abstinent or satiated conditions on any of the five CGT measures (risk-taking, quality of decision making, deliberation time, risk adjustment, delay aversion and overall proportion bet), $ps > .05$.
- H5:**
 - Average bet size in dollars (i.e., total dollar amount wagered in the VLT session divided by the total number of bets in that session) was significantly different between the two conditions, $t(20) = -2.72, p = .013$, with the abstinent group betting significantly more per bet ($M = \$4.28, SD = \2.66) than the satiated group ($M = \$3.36, SD = \2.26).
- Mood Measures:**
 - VAS: for item 11 ("crave cigarette"), there was a significant interaction between pharmacology and time, $F(3, 60) = 3.06, p = 0.35$. Average ratings for "crave cigarette" significantly increased from T1 to T4 in the satiated group only.
 - MPSS: total average MPSS scores differed significantly between the satiated ($M = 15.81, SD = 4.83$) and abstinent ($M = 17.76, SD = 4.78$) groups, $t(20) = -2.23, p = .038$.

Results

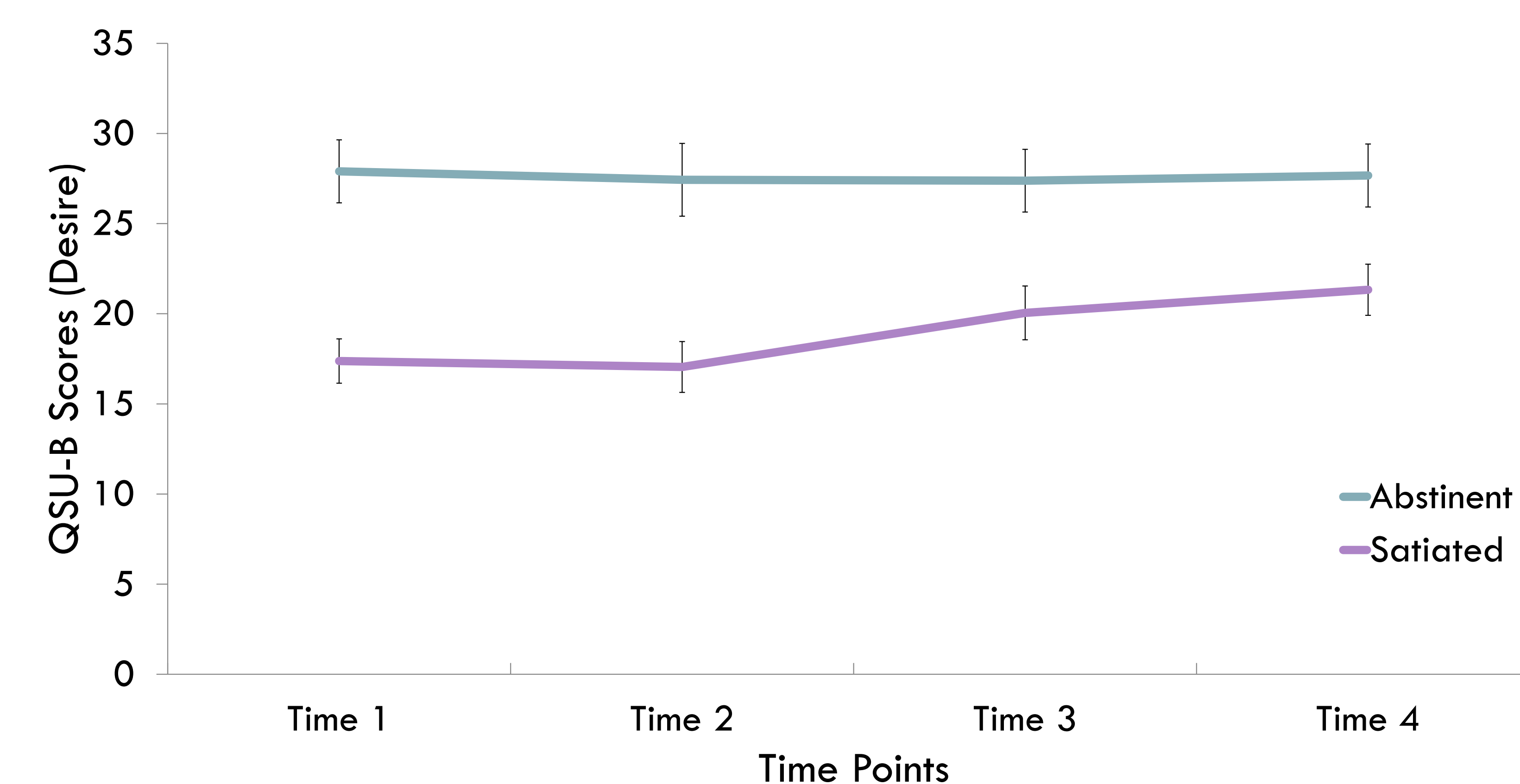


Figure 1. Average QSU-B scores on item "desire to smoke" across four time points for the abstinent and satiated conditions.

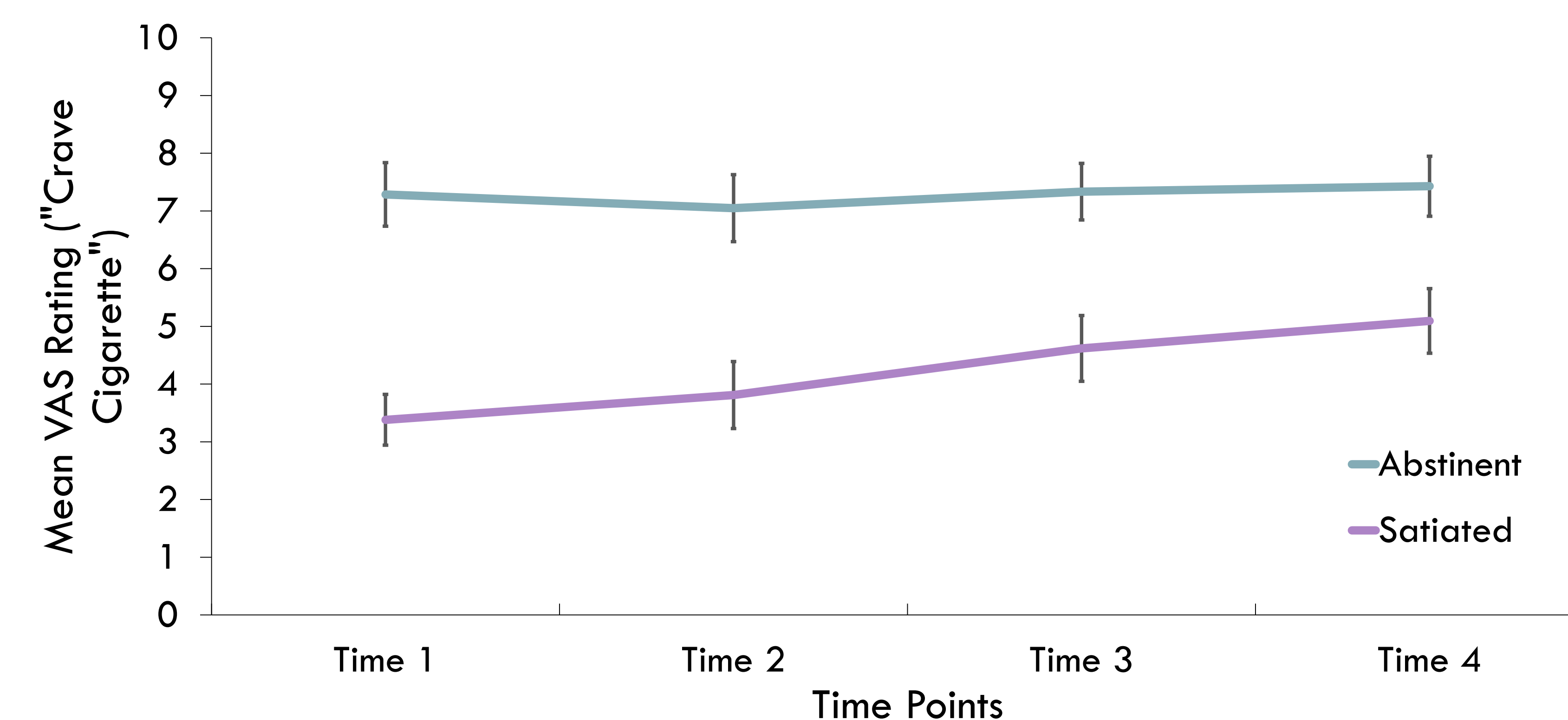


Figure 2. Mean VAS scores on item "crave cigarette" across four time points for the abstinent and satiated conditions.

Discussion

- Although the results supported H1 and H3, we did not find any differences between conditions on CGT measures or gambling cravings (H2 and H4).
- Furthermore, although we did find a difference between conditions on VLT play, it was in the opposite direction than predicted. Contrary to H5, the abstinent group had a higher average bet compared to the satiated group.
- Cigarette cravings were enhanced after exposure to gambling stimuli in the satiated condition, but not the abstinent condition. This may suggest that exposure to gambling activities enhances cravings to smoke.
- Altogether, the aggregate of these findings do suggest that tobacco withdrawal may impact gambling behaviours, although more research is necessary in order to fully understand this relationship.