Spending Time in Nature Serves as a Protective Factor Against Harmful Alcohol Use: A Structural Equation Modeling Approach

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Introduction

- Harmful alcohol use is associated with far-reaching personal and societal consequences.[1]

- Positive and negative affect are associated with alcohol consumption, while negative affect is associated with problematic alcohol use.[2,3]

- Rapid delay discounting (i.e., the tendency to prefer a smaller-sooner reward over a larger-delayed one, which is considered as more "impulsive" decision making) is associated with alcohol use disorder.[4]

- Exposure to nature increases positive affect, decreases negative affect, and was found to reduce delay discounting (less "impulsive" decision making).[5,6]

- Despite the beneficial effects of natural environments on constructs related to harmful alcohol use (e.g., affect, delay discounting), the potential therapeutic effects of exposure to natural environments have not been examined in the context of alcohol use.

- Additional research testing the mechanisms through which exposure to nature may impact alcohol use, as well as distinguishing between passive exposure to residential greenness and active contact with nature, is warranted for prevention and treatment purposes.

The purpose of this research was to test the relationships among exposure to nature, the mediators of affect and delay discounting, and alcohol use, using structural equation modeling.

Methods

- Cross sectional data collected online on Amazon MTurk.

- 340 participants, mean age 40.9 (SD = 12.50), 50.9% female.

- Based on AUDIT scores: 66.5% reported drinking alcohol, 8.2% reported harmful alcohol drinking, 6.8% reported dependent drinking.

- Two alcohol outcomes were tested:
  (1) **Alcohol consumption** (i.e., frequency of use, quantity of use, and frequency of heavy drinking).
  (2) **Alcohol-related problems** (e.g., memory loss, feelings of guilt, failing to do what is normally expected, injury).

- To distinguish between two aspects of exposure to nature, two nature variables were included:
  (1) **Active exposure**; frequency and duration of visits to natural spaces.
  (2) **Passive exposure**; the level of greenness around the home and work environment.

- Measures are included in **Figure 1**.[7-13]

- We used MPlus (v8.4) to establish measurement of latent constructs and assess structural equation models of the hypothesized mediation effects.

Results and Discussion

- All models fit the data at acceptable to good levels (see **Table 1**.)

- **Positive affect** mediated the effect of exposure to nature on alcohol consumption (model 1), but not on alcohol-related problems (model 2).
  While both aspects of nature were associated with greater alcohol consumption, the consumption associated with positive affect may not be as harmful.

- **Negative affect** mediated the effect of active exposure to nature on both alcohol consumption (model 1), and alcohol-related problems (model 2).
  Active exposure to nature was negatively associated with both alcohol outcomes, suggesting a protective effect against harmful drinking, that is associated with negative affect.

- **Delay discounting** paths were non-significant. Impulsive decision-making did not mediate the effect of nature on alcohol.

- Only the indirect effect of active exposure to nature on alcohol-related problems mediated through negative affect was significant (Standardized mediated effect = -.048, SE = .022, p < .05).

- Taken together, active exposure to nature may reduce the likelihood of experiencing alcohol-related consequences by reducing one's negative affect.

Figure 1. The relationships among nature, affect, delay discounting, and alcohol, controlling for age, gender, and income.
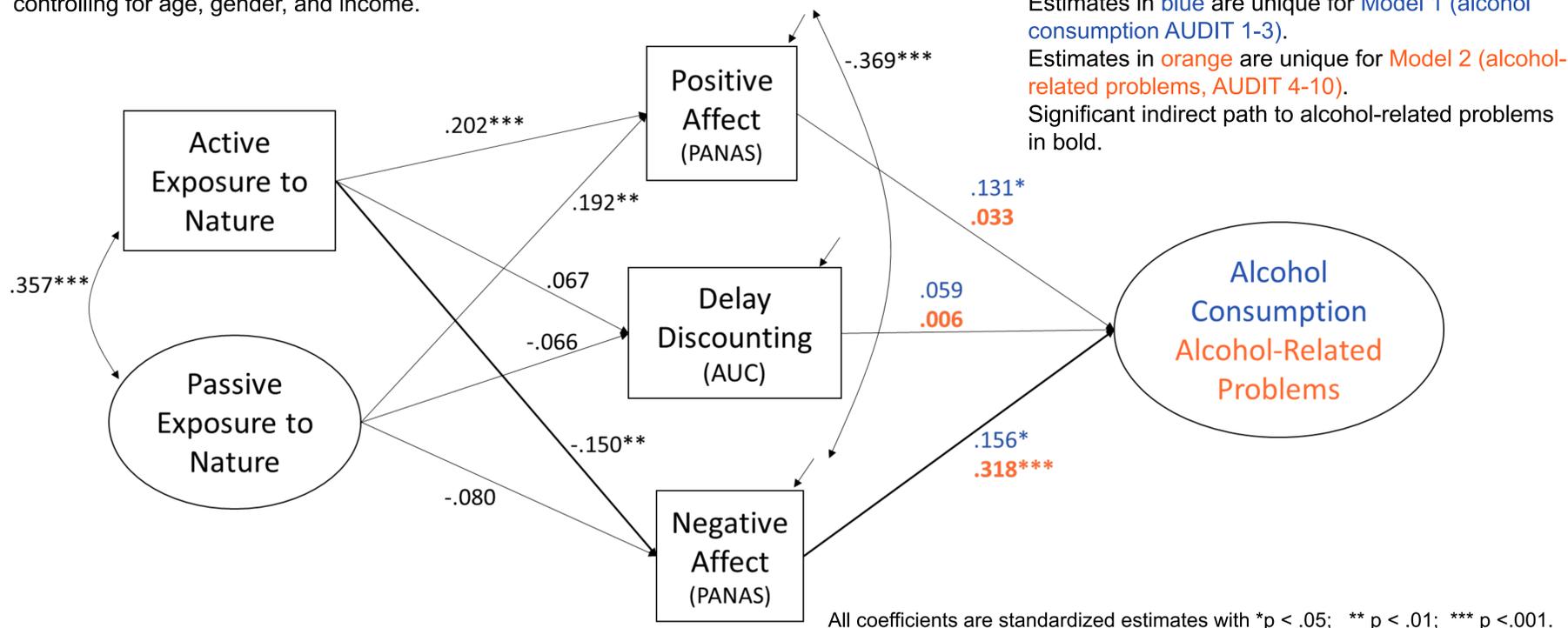
Estimates in black are identical in both models.
Estimates in blue are unique for Model 1 (alcohol consumption AUDIT 1-3).
Estimates in orange are unique for Model 2 (alcohol-related problems, AUDIT 4-10).
Significant indirect path to alcohol-related problems in bold.

All coefficients are standardized estimates with *p < .05; ** p < .01; *** p < .001.

Table 1. Model Fit Indices.

		χ2(df)	RMSEA	CFI	SRMR
Model 1 Alcohol Consumption	Measurement Model	216.972 (85) p < .001	0.068	0.928	0.069
	Structural Model	218.760 (90) p < .001	0.065	0.928	0.073
Model 2 Alcohol-Related Problems	Measurement Model	257.255 (151) p < .001	0.045	0.947	0.064
	Structural Model	259.900 (157) p < .001	0.044	0.948	0.064

Note. Measurement models include all covariate paths. In the structural models, nonsignificant covariate paths were set to zero.

Conclusion

- Actively spending time in nature was related to improved affect, which was further associated with lower levels of harmful alcohol use.

- Even if the residential area is low on greenness, actively spending time in nature provides benefits to reduced likelihood of harmful alcohol consequences.

- Findings have potential implications for environmental design and for health programs targeting prevention and treatment of alcohol-related problems.

For references, sample demographics and other details go to:
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