

USING LINGUISTIC INQUIRY AND WORD COUNT (LIWC) TO PREDICT FUTURE ALCOHOL-RELATED RISK FROM FREE-RESPONSE LANGUAGE DURING SIMULATED ALCOHOL OFFERS

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Introduction

- The language people use can reveal subtle information about personality, cognition, mental health, and behavior.
- Computational methods have not been applied to predicting alcohol use from language used while in risky drinking situations.
- The aim of this study was to examine the use of a digital text-analysis software (i.e., Linguistic Inquiry and Word Count [LIWC]; Pennebaker, Francis, & Booth, 2001) to predict future risky alcohol use using language elicited during a paradigm designed to simulate real-world drinking situations.
- We hypothesized that individual words used in response to the simulation would correlate with risky alcohol use

Method

Participants. Our sample included 57 college students recruited in the first two weeks of matriculation (59.8% female, 81.5% white). Participants completed the full assessment battery at baseline and reported their alcohol use 8 months later.

Measures.

The Collegiate Simulated Intoxication Digital Elicitation (C-SIDE). The C-SIDE (Anderson et al., 2013) is comprised of audio simulations depicting common college-drinking situations. After each, participants speak about the scene.

Behavioral willingness (BW). Participants indicated their willingness to accept C-SIDE alcohol offers (1 = not at all willing to 5 = very willing). The reliability for this scale was $\alpha = .92$.

The Alcohol Use Disorders Identification Test (AUDIT). The AUDIT (Babor et al., 2001) is a 10-item measure for screening alcohol risk. Scores 8 and greater (range = 0- 40) suggest problematic drinking among college student populations. Internal consistency was $\alpha = .78$.

Statistical approach. LIWC data consisted of use frequencies of a range of linguistic categories in C-SIDE free-response transcripts. We analyzed the relationship between the LIWC data and the AUDIT outcomes at baseline and 8-month followup using regression models. We also conducted a simple regression analysis between LIWC data and BW scores.

Table 1. Descriptive statistics and examples of linguistic variables.

	Examples of Included Words	M	SD	Range
Alcohol Variables				
BW		2.84	1.08	1.00-4.80
AUDIT2		23.00	8.62	0.00-23.00
AUDIT1		28.00	6.29	0.00-28.00
Linguistic Variables				
Function	it, to, no	55.32	57.20	10.55-65.87
They	they, their	1.65	0.63	0.00-1.65
Adverb	very	7.84	8.96	5.61-13.45
Affiliation	friend	5.66	1.89	0.43-6.09
Reward	benefit	3.85	2.08	0.70-4.55
Home	kitchen	1.83	0.48	0.00-1.83

Table 2. Correlation matrix for behavioral willingness, time 1 & 2 AUDIT scores, and key linguistic variables ($n = 57$).

	BW	AUDIT2	AUDIT1	Function	They	Adverb	Affiliation	Reward
AUDIT2	.65**							
AUDIT1	.65**	.75**						
Function	-.27*	-.24	-.21					
They	-.28*	-.09	-.12	.12				
Adverb	-.33*	-.16	-.26	-.01	.10			
Affiliation	.29*	.33*	.29*	-.68**	.02	-.10		
Reward	.31*	.22	.12	.21	-.01	-.07	-.06	
Home	.18	.46**	.23	-.29*	.02	-.15	.30*	.02

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Results

- When controlling for baseline AUDIT scores, only language regarding home life (e.g., kitchen, landlord) had a significant positive relationship with 8-month AUDIT scores (Table 2), $r = .413, p < .05$.
- There were significant positive correlations between BW to accept alcohol offers and language regarding social affiliation and reward (Table 2).
- There were significant negative correlations between BW and use of adverbs, “they”, and function words (Table 2).



Discussion

- Overall, these results indicate that there may be linguistic markers that relate to alcohol-use behavior.
- We found significant correlations between linguistic variables and 8-mo. AUDIT scores; most of these relationships disappeared after controlling for baseline AUDIT scores.
- Language regarding home life remained significantly correlated with 8-mo. AUDIT scores, suggesting people who are oriented towards home-related concepts may also be at greater risk for risky alcohol use.
- Several linguistic variables were significantly correlated with accepting alcohol offers, including social affiliation and reward, suggesting that high regard for social life and greater reward sensitivity may increase alcohol consumption.
- This is a novel finding that simple text analysis may have utility for recognizing risky future alcohol use in college populations.

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