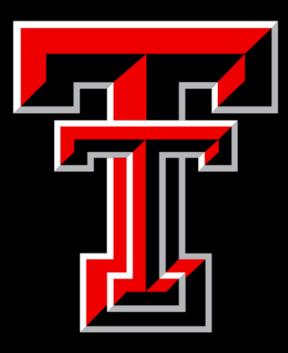# Cannabis and Schizotypy: Revisiting an Old Problem

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Introduction

- The link between cannabis and schizotypy (i.e., patterns of behavior which typify a genetic predisposition for schizophrenia-spectrum pathology; see Meehl, 1962) is well-documented (e.g., Caspi et al., 2005; Cohen et al., 2010).

- Indeed, previous work estimates individuals with schizotypy are 2-5 times more likely to report cannabis use (Cohen et al., 2010). In light of this association, some speculate cannabis use may contribute to the expression of schizophrenia-spectrum symptoms (e.g., Davis et al., 2013).

- However, as Earleywine (2006) aptly noted, several markers of schizotypy assessed by self-report measures (e.g., speech-related problems, such as forgetting what one is saying) may also represent common effects of cannabis use (e.g., working memory deficits).

- Given the serious implications of assuming a causal role of cannabis in the onset of schizotypal behaviors, it is crucial to ensure assessments of schizotypy are measurement invariant across cannabis use status. Without testing this assumption, it is possible cannabis users may be differentially responding to items on schizotypy measures as a function of some confounding variable (e.g., cannabis-related effects).

- To date, only one study has previously examined differential item functioning (DIF) of a schizotypy measure across cannabis use status (i.e., former versus current users; Earleywine, 2006). This work found DIF for the item, "I sometimes use my words in unusual ways."

CURRENT STUDY

- The current study aimed to reexamine whether speech-related items on a commonly used measure of schizotypy exhibit DIF. In addition to examining current versus former users, we also assessed DIF with reference to nonusers.

- We hypothesized all four speech-related items would exhibit DIF across cannabis users versus nonusers.

Method

PARTICIPANTS

Undergraduates from a large, Hispanic-serving southwestern university (N = 669, 63% female; 66% White; 27% LatinX; Mage = 19.31, SD = 1.52; range = 18-25)

MATERIALS

- **Demographics** (age, gender, race, ethnicity)
- **Schizotypal Personality Questionnaire – Brief Revised** (SPQ-BR; Cohen et al., 2010)
  - Odd Speech Subscale (4 items, 5-point Likert-type scale)
- **Cannabis use**
  - Self-reported lifetime and past-month use (dichotomized)

PROCEDURE

- Participants completed a battery of measures online for a larger study examining personality and substance use.

ANALYTIC PROCEDURE

- To assess differential item functioning, measurement invariance was tested using multigroup confirmatory factor analyses in Mplus version 7.4 (Muthén & Muthén, 1998-2012). SPQ-BR items were modeled as ordinal using an WLSMV estimator. Category response options were collapsed as necessary to ensure adequate endorsement. The DIFFTEST was used to assess statistically significant changes in model fit.

- Cannabis use status was categorized into lifetime use (but not past-month), past-month use, or nonuse.

- Measurement invariance was tested for all Odd Speech items across all cannabis use statuses. When invariance was not found, partial scalar variance was assessed, item by item (see Stevens, Blanchard, Shi, & Littlefield, 2018).

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Results

DESCRIPTIVE STATISTICS

Table 1. Cannabis Use Status Frequencies

	Non-users	Life-time*	Past-month
Total	266 (41%)	178 (27%)	206 (32%)
Females	183 (44%)	114 (27%)	120 (28%)
Males	83 (36%)	64 (27%)	86 (37%)

*Note: *Lifetime use not including past-month users*

Results indicated the four-item Odd Speech subscale was not invariant across nonusers and past-month users (see Table 2).

Table 2. Scalar Model Fit and DIFFTESTs

	CFI	RMSEA	DIFF-TEST	df	*p*-value
LT v PM v Nonusers	.99	.05	42.84	(28)	.04*
Any use v Nonusers	.99	.05	23.73	(14)	.04*
LT v Nonusers	.99	.04	19.63	(14)	.14
PM v Nonusers	.99	.06	26.37	(14)	.02*
LT v PM	1.00	.01	14.62	(14)	.40

Note: LT = lifetime use not including past-month users; PM = past-month; *p < .05

- Comparing users versus nonusers, as well as past-month users versus nonusers, invariance achieved by freeing OS2, OS3, and OS4.

Items Exhibiting DIF:

OS2-"Do you tend to wander off the topic when having a conversation?"

OS3-"I often ramble on too much when speaking."

OS4-"I sometimes forget what I am trying to say."

Only OS1- "I sometimes jump quickly from one topic to another when speaking." did not exhibit DIF.

Discussion

- Our findings indicated multiple items on the Odd Speech subscale of the SPQ-BR exhibited DIF across cannabis use status.

- Despite differences in statistical approaches, these findings of DIF are broadly consistent with earlier work by Earleywine (2006).

- Although directions on the SPQ-BR ask individuals not to include substance-induced experiences when answering, cannabis users may be reporting on cannabis-induced outcomes on items of the Odd Speech subscale, rather than endorsing behavioral indications of schizotypy.

- Thus, cognitive interviewing with cannabis users while taking the SPQ-BR may be beneficial in understanding why these items function differently across users and nonusers.

- Limitations include use of self-report, lack of power to test effects by gender, and categorization of use status.

- Given these preliminary findings, assessing for DIF across cannabis use status on measures of schizotypy and similar constructs is necessary before any relation, causal or correlational, between cannabis use and schizophrenia-spectrum pathology can be elucidated.

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