Sleep-Related Cannabis Expectancies Questionnaire (SR-CEQ): Replication and Psychometric Validation among College Students using Cannabis for Sleep Aid

Aubriana A. Schwarz, Patricia A. Goodhines, Amelia V. Wedel, Lisa R. LaRowe, Aesoon Park

Department of Psychology, Syracuse University

BACKGROUND

- Cannabis is commonly used to aid sleep among college students

- Although cannabis outcome expectancies have been associated with the progression of cannabis use, *sleep-related* expectancies have not been included in widely-used cannabis expectancy measures

- This gap was remedied by the Sleep-Related Cannabis Expectancies Questionnaire (SR-CEQ; Goodhines et al., 2020)
  - The SR-CEQ was developed and initial evidence for its 2-factor structure was obtained in a general college sample (including non-cannabis users)

- However, the SR-CEQ's associations with sleep and cannabis use behaviors among cannabis sleep aid users remains unknown

STUDY AIMS

- Among college students using cannabis for sleep aid:
  - Replicate the previous 2-factor structure
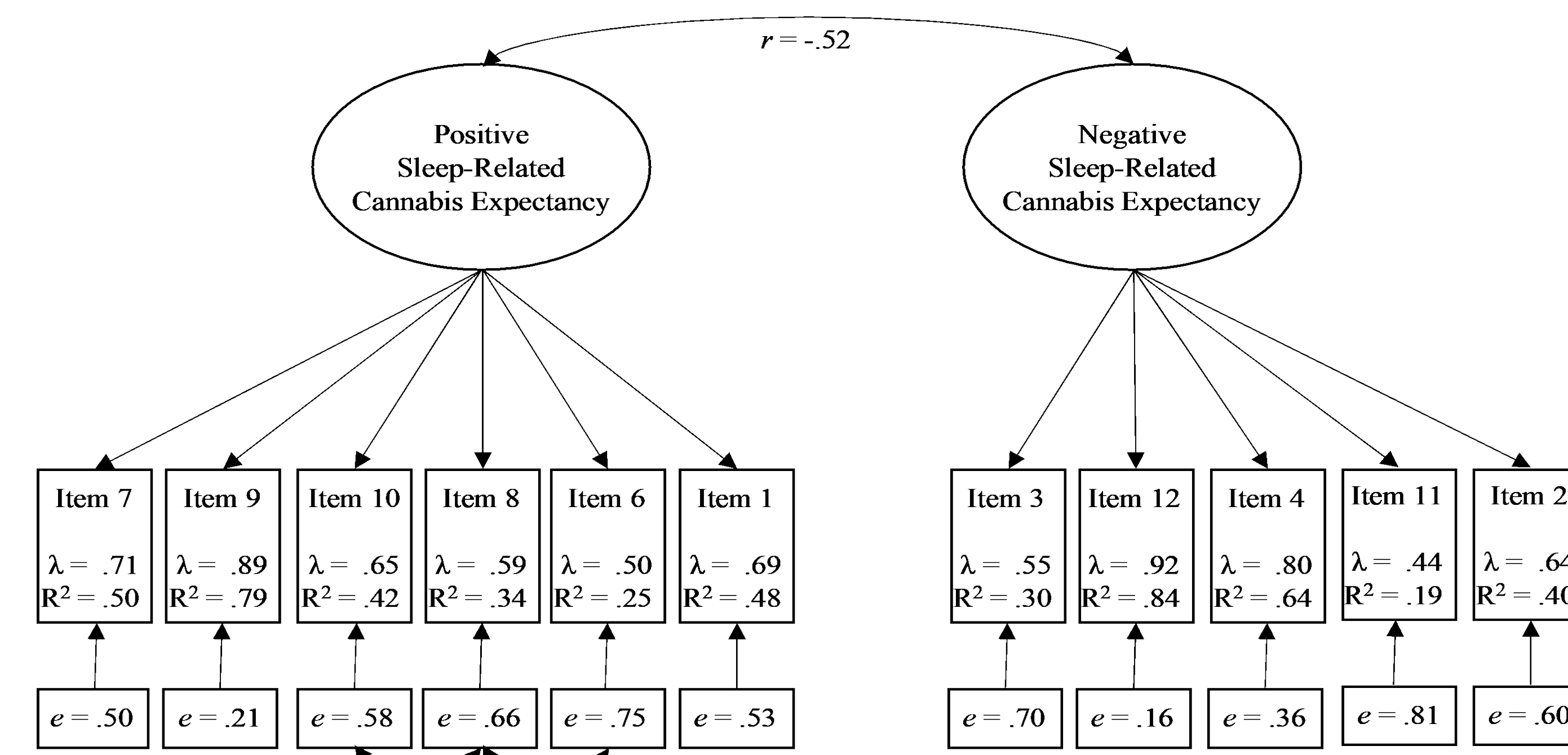 - Test construct and concurrent validity of the SR-CEQ

METHOD

- **Participants & Procedure:**
  - N = 89 college students (M_{age}=19.92 [SD=1.19; range=18-22]; 66% female; 72% White, 12% Multiracial, 7% Asian, 5% Black or African-American, 1% self-reported Other, and 3% did not disclose; 14% Hispanic/Latinx)
  - Online cross-sectional survey of sleep and substance use behaviors
- **Measures**
  - **Sleep-Related Cannabis Expectancy Questionnaire (SR-CEQ):** 12 items assessed cannabis-related sleep expectations for same-night sleep (i.e., quality, duration, onset latency, and nocturnal wakings) and associated diurnal functional impairment (i.e., sleepiness and difficulties with concentration and carrying out tasks); positive and negative subscale scores used for analysis (Goodhines et al., 2020)
  - **Sleep:** 7-item Insomnia Severity Index (Bastien, Vallieres, & Morin, 2001); 16-item Dysfunctional Beliefs About Sleep Scale (Morin et al., 1993); 10-item Pittsburgh Sleep Quality Index Global Score (Buysse et al., 1989)

- **Cannabis:** Single item assessed past-month frequency (PhenX Toolkit, Ver. 23); 60-day Timeline Follow-Back assessed frequency and quantity (Sobell & Sobell, 1992); 6-item Marijuana Effects Expectancy Questionnaire-Brief (Torrealday et al., 2008); 50-item Marijuana Consequences Questionnaire (Simons et al., 2012)
- **Demographics:** Single items assessed sex, age, race, and ethnicity (PhenX Toolkit, Ver. 23), and history of positive COVID-19 test result (Vidot et al., 2020)
- **Data Analytic Strategies**
- Descriptive statistics were completed using SPSS Ver. 23 (IBM Corp. 2016) and factor analyses were completed using MPlus Ver. 8 (Muthén and Muthén 2012).
- The confirmatory factor analysis (CFA) replicated the 2-factor structure (Positive and Negative Sleep-Related Cannabis Expectancies)
- Bivariate correlations tested associations with related constructs (sleep and cannabis use behaviors/beliefs), and independent-samples t-tests further explicated relevant group differences

Figure 1. N = 89. Oblimin rotated confirmatory factor analysis (CFA) for the Sleep-Related Cannabis Expectancy Questionnaire (SR-CEQ) with maximum likelihood (ML) estimation. Standardized factor loadings (λ), observed variable squared multiple correlations (R²), and standardized residual variances (e) are reported for each measure item. Fit indices: χ^2 (41) = 66.76, p=.01; Comparative Fit Index = 0.94; Standardized Root Mean Square Residual = 0.07; Root Mean Square Error of Approximation = 0.08, 90% Confidence Interval [0.05, 0.12].

Table 1
Descriptive Statistics and Bivariate Correlations Among Study Variables

Variable (possible range)	M (SD) or %	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. SR-CEQ: Positive (1-5)	3.40 (0.61)	—															
2. SR-CEQ: Negative (1-5)	2.06 (0.68)	-.47**	—														
3. Male sex (1 vs. 0)	0.34 (0.48)	-.05	.24*	—													
4. Age (18-25)	2.92 (1.19)	-.02	.05	-.04	—												
5. White race (1 vs. 0)	0.74 (0.44)	-.07	.26	-.01	-.02	—											
6. Hispanic/Latinx ethnicity (1 vs. 0)	0.14 (0.35)	.03	.16	.07	-.06	-.17	—										
7. Positive COVID-19 (1 vs. 0)	0.15 (0.36)	-.08	.10	.05	.07	.25*	.11	—									
8. Insomnia Severity Index (0-28)	8.69 (4.54)	.16	.12	-.01	-.10	.04	-.13	-.01	—								
9. Dysfunctional Beliefs About Sleep (0-10)	4.05 (1.38)	.24*	.09	-.09	.09	.03	.08	-.05	.38**	—							
10. Global PSQI Score (0-21)	6.87 (2.71)	.11	.09	-.04	.04	-.02	-.10	-.05	.71**	.38**	—						
11. Thirty-Day Cannabis Frequency (1-7)	5.32 (1.03)	.16	-.07	.00	.01	.12	-.11	.15	.22*	.04	.16	—					
12. Sixty-Day Cannabis Use Frequency (0-60)	35.97 (16.77)	.20	-.16	.04	.04	.08	-.22*	.22*	.11	.17	.11	.76**	—				
13. Sixty-Day Cannabis Use Quantity (1.86)	1.86 (1.10)	.06	-.03	-.02	-.02	.04	-.06	.22*	.06	-.05	.11	.37**	.33**	—			
14. Thirty-Day Cannabis Sleep Aid Frequency (0-7)	4.73 (1.57)	.18	-.14	-.03	.04	.04	-.07	.21	.21*	.05	.18	.76**	.71**	.32**	—		
15. Marijuana Expectancies: Positive (1-5)	4.22 (0.56)	.28**	-.14	.04	-.15	-.03	.06	-.01	.03	.16	.02	.27*	.28**	.07	.29**	—	
16. Marijuana Expectancies: Negative (1-5)	3.10 (0.63)	-.06	.45**	-.02	.01	.24*	-.03	.09	.13	.27**	.12	-.07	-.08	-.06	-.18	-.04	—
17. Marijuana Consequences (0-50)	5.60 (4.05)	.03	.26*	.12	-.12	.09	-.14	-.01	.22*	.23*	.23*	.37**	.41**	.42**	.13	.08	.28*

Note. N=89. Pearson's correlation coefficients are reported for two continuous variables; Spearman's coefficients (r_s) are reported for continuous and dichotomous variables; Phi coefficients (r_φ) are reported for two dichotomous variables.
*p<.05; **p<.01; ***p<.001.

KEY FINDINGS

- After dropping item 5 (λ<.40), 2-factor model replication showed good fit to the data

POSITIVE sleep-related cannabis expectancies :

- were associated with dysfunctional beliefs about sleep but not insomnia symptoms, poor sleep quality, or frequencies of cannabis use

- were greater among students who used cannabis more frequently in general

NEGATIVE sleep-related cannabis expectancies:

- were not associated with any cannabis or sleep variables assessed

- were marginally lower among students with greater frequency of general cannabis use and cannabis use for sleep aid

- were greater among among male (versus female) students

DISCUSSION

- Results suggest that college students using cannabis for sleep aid may have less negative sleep-related expectancies about sleep

- Positive sleep-related cannabis expectancies were associated with dysfunctional beliefs about sleep, but not sleep behaviors or cannabis use

- Current novel findings extend existing knowledge of general non-sleep related cannabis expectancies among cannabis users in terms of cannabis use correlates

- Findings can help identify at-risk students and modifiable risk factors that can be targeted to minimize harm with cannabis sleep aid use