Lower **psychological flexibility** can enhance the effects of **dysfunctional beliefs** on **insomnia severity**.

The association between sleep-related cognitions, psychological flexibility, and insomnia symptoms

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Introduction

The cognitive-behavioral model of insomnia proposes that arousal, cognitions, behaviors, and perceived consequences play an important role in maintaining insomnia symptoms. The **metacognitive model of insomnia** expands this idea by defining cognitive activity as primary arousal and how one interprets those thoughts as a secondary arousal. Because **primary and secondary processes mutually influence each other**, the content of maladaptive sleep-related thoughts can impact the maintenance of insomnia disorder more strongly if one is rigidly attached to them.

Objective

To investigate if psychological inflexibility moderates the relationship between dysfunctional beliefs about sleep and insomnia severity.

Methods

Data were collected from online surveys responded by 629 adults, aged 18 to 59 years, who reported experiencing insomnia symptoms. Participants completed self-report questionnaires, including:

1. Hospital Anxiety and Depression Scale (HADS);
2. Insomnia Severity Scale (ISI);
3. Dysfunctional Beliefs and Attitudes about Sleep Scale (DBAS-16);
4. Acceptance and Action Questionnaire (AAQ-II).

All continuous predictors were standardized prior to data analysis. A linear model (estimated using OLS) was fitted to predict ISI scores from DBAS-16 and AAQ-II with age, sex and HADS subscales as covariates:

$$IGI \sim Age + Sex + HADSA + HADSD + DBAS \times AAQII$$

Results

Table 1: Study participants (N = 629) descriptive statistics.

	N/Mean (%/SD)
Age (years)	38 (10.1)
Gender	
Female	492 (78.2)
Male	137 (21.8)
Race/ethnicity	
Asian	31 (4.93)
Black	154 (24.5)
Other/Not informed	5 (0.795)
White	439 (69.8)
Education	
≤ 12th grade	62 (9.86)
College degree or higher	462 (73.4)
Some college	105 (16.7)
Region of origin	
Central-West	28 (4.45)
North	11 (1.75)
Northeast	43 (6.84)
South	53 (8.43)
Southeast	494 (78.5)
Sleep Medication	
1-5 days a week	141 (22.4)
6-7 days a week	234 (37.2)
Don't use	254 (40.4)

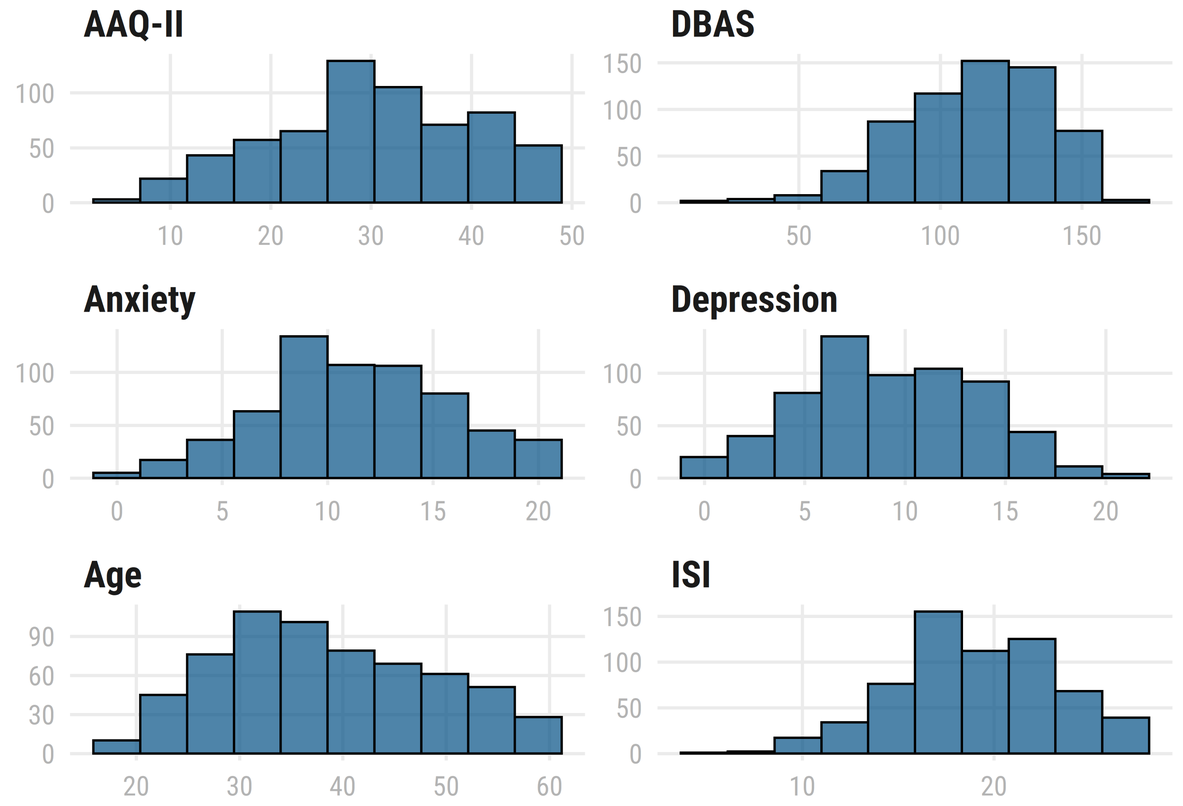

Figure 1: Distribution of continuous variables in the model.

The results of the regression indicated that the model significantly predicted ISI scores (F(621, 7) = 42), $p < 0.001$, $R^2_{adj} = 0.31$), accounting for 31% of the variance.

Table 2: Results from the regression model examining the effects of age, sex, cognitive processes (DBAS-16 and AAQ-II) and anxiety and depressive symptoms (HADS-A and HADS-D) on the severity of insomnia.

	Coef.	Std.Error
Age	0.003 [-0.003, 0.010]	0.003
Sex	0.027 [-0.131, 0.185]	0.080
HADS-A	0.149 [0.057, 0.241]**	0.047
HADS-D	0.071 [-0.023, 0.165]	0.048
DBAS-16	0.393 [0.317, 0.469]***	0.039
AAQ-II	0.107 [0.006, 0.208]*	0.051
DBAS-16 x AAQ-II	0.068 [0.009, 0.127]*	0.030

* p < 0.05, ** p < 0.01, *** p < 0.001

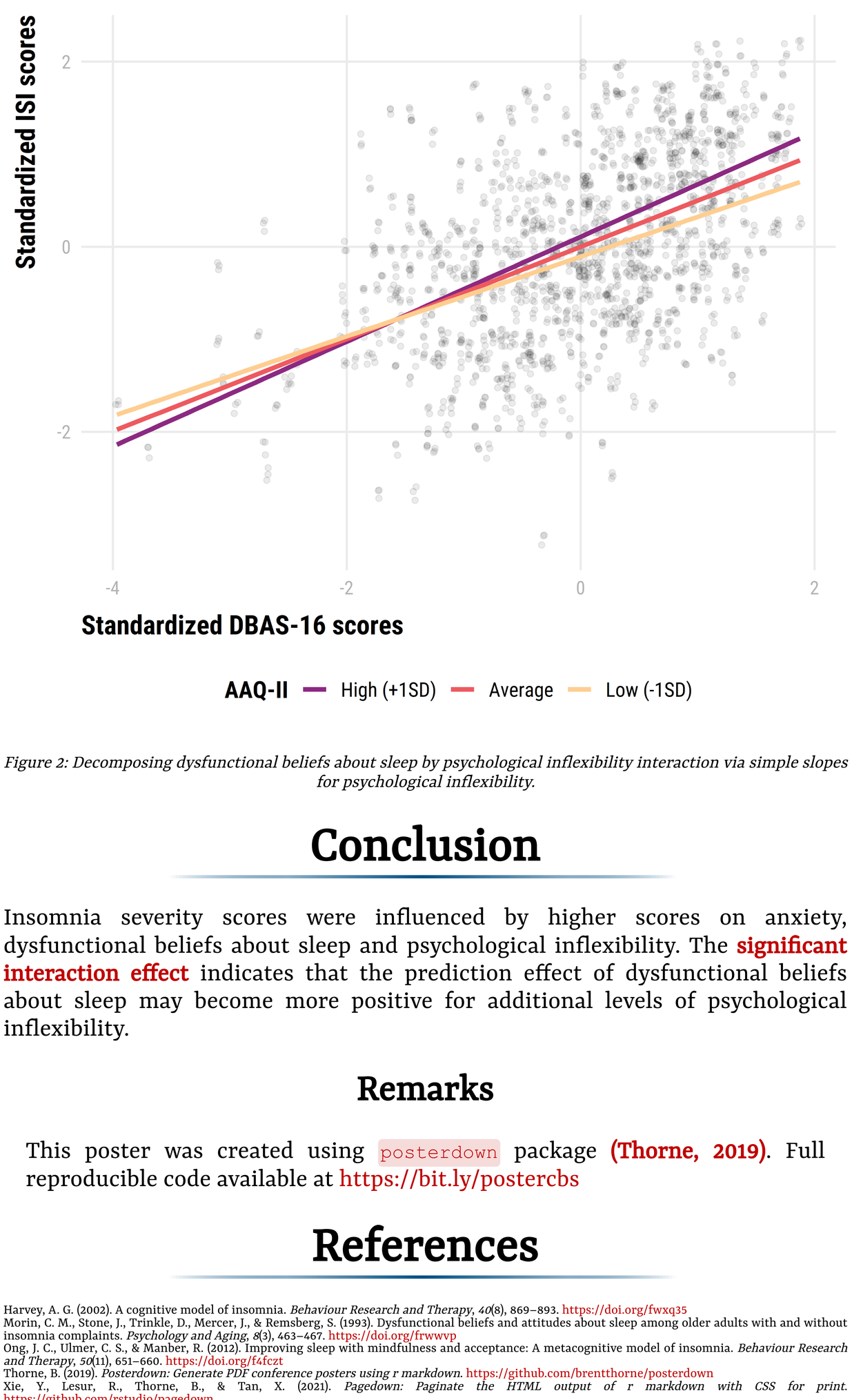

Figure 2: Decomposing dysfunctional beliefs about sleep by psychological inflexibility interaction via simple slopes for psychological inflexibility.

Conclusion

Insomnia severity scores were influenced by higher scores on anxiety, dysfunctional beliefs about sleep and psychological inflexibility. The **significant interaction effect** indicates that the prediction effect of dysfunctional beliefs about sleep may become more positive for additional levels of psychological inflexibility.

Remarks

This poster was created using `posterdown` package **(Thorne, 2019)**. Full reproducible code available at https://bit.ly/postercbs

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