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Inauguraldissertation

zur

Erlangung des Doktorgrades

der Humanwissenschaftlichen Fakultät

der Universität zu Köln

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vorgelegt von

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aus

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Tag der Abgabe: 01.01.1970

Acknowledgment

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Summary

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Introduction

Insomnia disorder is related to dissatisfaction with duration or quality of sleep. It can be a source of distress and impairment by decreasing productivity on work or school and lowering energy to engage in social activities (Association, 2013). Prolonged effects of insomnia are associated with higher risk of harm on mental health (Johnson et al., 2006; Taylor et al., 2005) and cognitive functioning (Fortier-Brochu et al., 2012). Cognitive arousal is crucial to several behavioral models of insomnia as maintainer of the disorder (Espie et al., 2006; Harvey, 2002; Lundh, 2005; Morin et al., 1993; Ong et al., 2012; Perlis et al., 1997).

Dysfunctional beliefs and attitudes about sleep

Harvey's model (Harvey, 2002) is frequently mentioned as theoretical background in investigations about cognitive process in insomnia. It posits that the excess of negatively toned activity about sleep triggers arousal and distress, channeling attention and monitoring to sleep threats. This may create distorted perceptions of sleep and overestimation of the real deficits during the day. To cope, the individual may engage in safety behaviors that paradoxically increase worry and preclude sleep self correction. In Harvey's model, dysfunctional beliefs about sleep exacerbates negatively toned cognitive activity. Such beliefs are also the backbone of the Microanalytic model (Morin, 1993), one of the most cited models for insomnia in the literature (Marques et al., 2015).

Current evidence favors that beliefs and attitudes about sleep mediates insomnia perpetuation (Akram et al., 2020; Chow et al., 2018; Harvey et al., 2017; Lancee et al., 2019), although not all studies have found this association (Norell-Clarke et al., 2021). Morin (1993) suggests that insomnia maintenance feeds from a cyclic process of arousal, dysfunctional cognitions, maladaptive habits and consequences. Arousal refers to excessive activity in emotional, cognitive or physiologic domains, which can create core beliefs that guide information processing (Marques et al., 2015). This may give rise to unrealistic expectations and rigidly held beliefs about requirements for sleep, as well as increased worry about the causes and consequences of sleep disturbances. Subsequent unhealthy sleep practices may include daytime napping, excessive time in bed or indiscriminate use of sleep medication. Consequences, real or perceived, are linked to diminished performance during the day.

Constructs and Their Relations. Individuals that show stronger insomnia symptoms typically demonstrate firm endorsement of dysfunctional beliefs about sleep (Carney & Edinger, 2006; Crönlein et al., 2014; Eidelman et al., 2016). Challenging those beliefs is in the core of Cognitive Behavioral Therapy for insomnia (CBT-I) (Belanger et al., 2006). A recent meta-analysis observed clinically significant improvements in beliefs and attitudes about sleep favoring CBT-I over controls – although, as the authors warn, those results should be interpreted with care given the low quality of evidence (Edinger J. D. et al., 2021). Insomnia severity was identified as risk factor for anxiety (Neckelmann et al., 2007) and depression (Blanken et al., 2020; Li et al., 2016), but some studies claim this relationship the other way around (Chen et al., 2017; Jansson-Fröjmark & Lindblom, 2008). A relationship between anxiety and depression with dysfunctional beliefs about sleep is also expected: Beck's classic cognitive mechanism for the cause and maintenance of depression gives a central role to inaccurate beliefs and maladaptive information processing (Beck, 1979). Anxiety can be elicited from displeasing memories created through exposure to adverse experiences (Brewin, 1996). Thus, unrealistic attributions and expectations about sleep (or lack of sleep) may elicit anxiety-provoking thoughts. Associação entre Depressão e DBAS (Sadler et al., 2013).

Measurement. To assess dysfunctional sleep-related beliefs and habits, Morin et al. (1993) developed the Dysfunctional Beliefs and Attitudes About Sleep Scale (DBAS). The DBAS started as a 30-item self-report instrument rated in a 100-mm visual analog scale of agreement/disagreement. Later, Morin and colleagues (2007) shortened it to a 16-item version, and replaced the response format for a 0-10 Likert-type scale. The items of the brief version were selected from the original scale based on criteria of response distribution, range, item-total correlations and exploratory oblique factor analysis. A 4-factor structure was fitted to the 16 items in a confirmatory factor analysis, labeled (a) consequences of insomnia, (b) worry about sleep, (c) sleep expectations, (d) medication, and a 5th second-order general factor. The DBAS is broadly employed in experimental studies assessing sleep-related cognitions, especially the 16-item version (Thakral et al., 2020). Many researchers translated and validated the DBAS-16 across various cultures. These studies successfully replicated the original factor structure and presented good validity evidences (Boysan et al., 2010; Dhyani et al., 2013; Lang et al., 2017). Moreover, the DBAS-16 outperformed the 30 and 10-item versions in reproducibility of factor structure, measures of internal consistency, concurrent validity and sensitivity to change (Chung Ka-Fai et al., 2016).

Sleep Problem Acceptance Questionnaire (SPAQ)

Constructs and Their Relations.

Measurement.

Objectives

The present project therefore aims at (a) developing a Brazilian portuguese translation of the Dysfunctional Beliefs and Attitudes about Sleep Scale (DBAS-16) and Sleep Problem Acceptance Questionnaire (SPAQ), (b) examining its factorial structure, and (c) examining its construct validity.

Method

Participants and Study Design

To estimate an adequate sample size for the confirmatory factor analyses we used MacCallum et al.'s (1996) root-mean-square error of approximation (RMSEA) tests of close and not-close fit. All tests were conducted in R (R Core Team, 2022) using `semTools` (Jorgensen et al., 2021). Morin (2007) reports RMSEA = 0.059 in a confirmatory factor analysis for DBAS-16. Taking this value as prior guess for the true RMSEA score, we calculated the sample sizes required to to reject the test for not-close fit of RMSEA > 0.08 and the test of close fit of RMSEA < 0.05 with a power of 0.80 and $\alpha = 0.05$. Results show that 267 subjects are necessary to reject the test for not-close fit, and the test of close fit would be rejected with 1177 participants. Therefore, we aimed at a minimum sample size of 1177 participants.

This study was approved by the committee of ethics of the Department of Psychiatry at the Faculty of Medicine of Universidade de São Paulo (Institutional Review Board IRB00003099). To be included, participants must age between 18 and 59 years and indicate no difficulties in reading or writing. Participants will be informed about the main objective of the research and sign the informed consent. Then, they are requested to respond to an online survey using REDCap electronic data capture tools hosted at Hospital das Clinicas de Sao Paulo - FMUSP (Harris et al., 2009, 2019), including the Brazilian-Portuguese version of DBAS-16 and SPAQ and other auxiliary instruments.

Measures

Translation

Analytical Plan

Partial results

Cross-cultural adaptation

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Appendix A

Sets of IADS sounds used in Experiment 1: Valence Positive, Neutral, Negative

Table A1
Sound-Nr. (Bradley & Lang, 2007)

Positive	Neutral	Negative
110	109	278
172	171	279
725	206	285
809	221	296
810	270	501
811	365	624
815	367	625
816	368	711
817	375	712
820	722	719

Appendix B

Priors for the Bayesian logistic mixed effects regression models of two-alternative forced choice responses

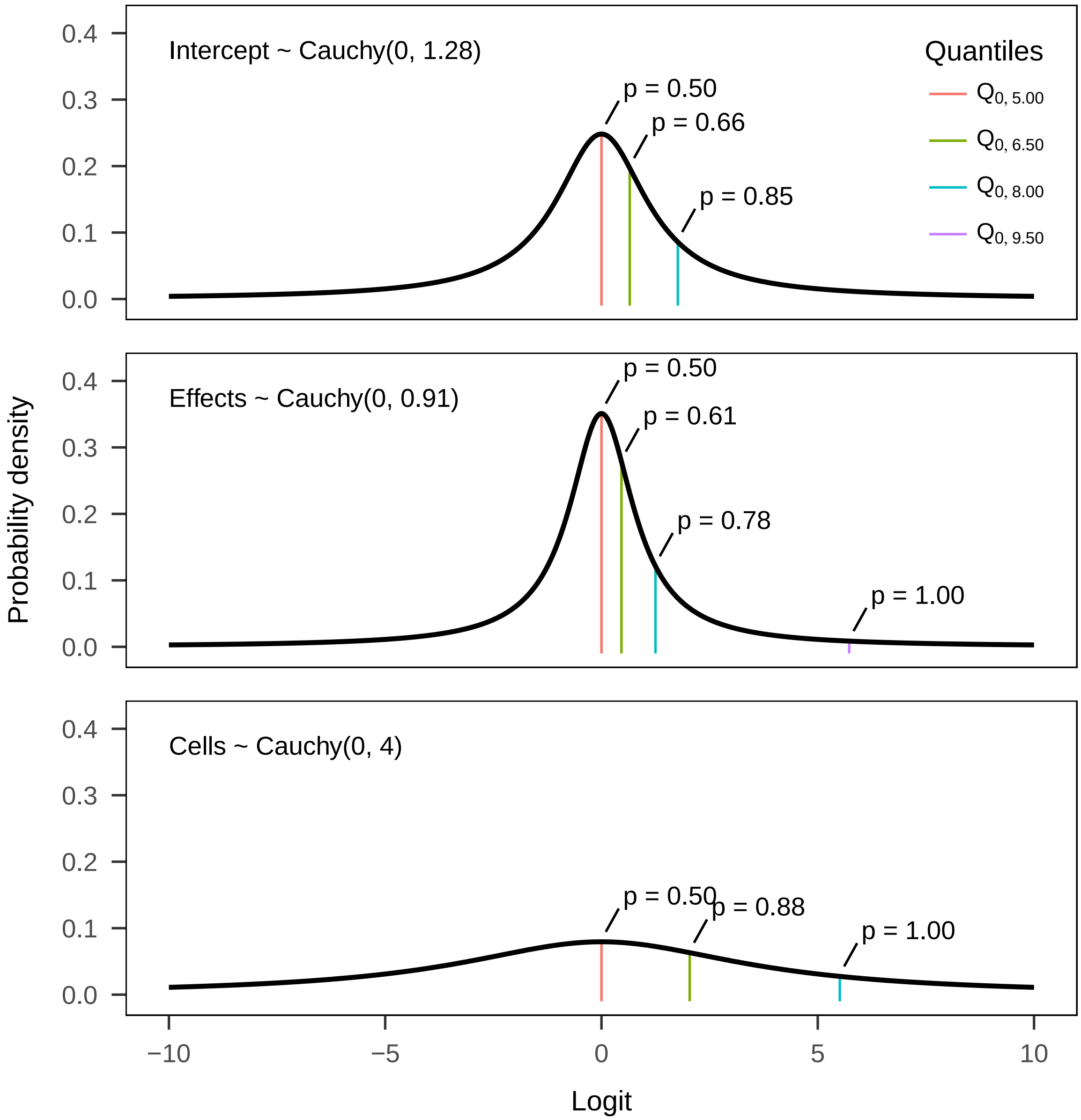

Figure B1. Priors for the Bayesian logistic mixed effects regression models of two-alternative forced choice responses. Colored lines represent distribution quantiles; annoted probabilities represent the resulting probability of choosing a positively paired CS starting from chance level (p = 0.5).

Appendix C

Mean CS visibility (Experiment 2 and Experiment 3)

Mean Visibility scores of each CS in Experiment 2 (chance level = .250, $N = 37$) and pilot of Experiment 3 (chance level = .125, $N = 7$) and the presentation time for each stimulus as used in Experiment 3.

Table C1
Mean CS visibility

CS	Visibility Study 2	Visibility Pilot	Set
03.png	.512	.400	1000 ms
08.png	.540	.329	1000 ms
14.png	.900	.657	1000 ms
22.png	.475	.400	1000 ms
04.png	.438	.200	20 ms
20.png	.400	.271	20 ms
50.png	.356	.129	20 ms
51.png	.423	.243	20 ms