

## SPANISH TRANSLATION OF THE MOOD RHYTHM INSTRUMENT: A NOVEL APPROACH TO MOOD EVALUATION

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### ABSTRACT

**Introduction:** The Mood Rhythm Instrument (MRI) is a questionnaire developed to assess the circadian rhythm of mood-related behaviors. The aim of this study was to translate this instrument from Brazilian Portuguese into Spanish.

**Methods:** The translation process consisted of forward translation, adjustment, back translation, back translation review and harmonization.

**Results:** Comparing the initial Spanish translation and the final Spanish version, there were no semantic differences and the items were not changed.

**Conclusions:** The Spanish version of the MRI is ready to be tested in a Spanish population. In the future, assessing and comparing mood-related behaviors in transcultural studies will be possible.

**Keywords:** *Circadian rhythms; daily rhythms; mood; psychometric; chronobiology*

The psychiatric classification system was initially developed with the intention of standardizing a diagnostic framework to all patients, regardless of country of origin or cultural background<sup>1,2</sup>. The diagnosis of mental disorders was based on medical research of categorical and qualitative variables through the actual and retrospective presence of patient symptomatology and the longitudinal quality of these symptoms<sup>3</sup>. The instruments created during the development of modern psychiatry identify and measure the intensity and evolution of psychiatric symptoms, which were structured according to diagnostic manuals, such as the Diagnostic and Statistical Manual of Mental Disorders (DSM-5)<sup>4</sup>. This approach considers only the presence or absence of symptoms and not aspects of their circadian rhythmicity or the variability of mood symptoms over 24 hours.

Recently, Souza et al.<sup>5</sup> developed the Mood Rhythm Instrument (MRI), which detects individual rhythms of cognitive and behavioral measures associated with mood states, such as self-esteem, social relationship, sadness, sexual arousal, pessimism and alertness. This variability in individual rhythms is important to the diagnosis of mood disorders and should be relevant to patient approach and treatment management. In a bipolar spectrum disorder, an improvement of the response of lithium treatment among core clock genes has been demonstrated<sup>6</sup>. Evidence of environmental disruptions related to exacerbation or precipitation of mood episodes has been described especially in shift work, travel across time zones, and irregular social schedules<sup>7</sup>. Taking into account this theoretical framework, a new approach in psychotherapy has been developed with a focus on social rhythmicity<sup>8</sup>. Consequently, patients with rhythm disruption could have more benefits, and symptoms related to chronodisruption could be identified.

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Since Spanish is one of the most spoken languages in the world<sup>9</sup>, the aim of this study was to translate the MRI from Brazilian Portuguese into Spanish. This will allow the application of this instrument to Spanish-speaking populations, thus enabling the performance of transcultural studies in the future.

## METHOD

### *Mood Rhythm Instrument*

The MRI is a self-assessment questionnaire developed by de Souza et al.<sup>5</sup>. Fifteen self-assessed items evaluate how individuals have felt for most of the time during the previous 15 days. The instrument assesses whether or not behavior items have a peak during the 24 hours of the day and, if so, the exact hour in which they occur. In a Brazilian population, the MRI had a satisfactory Cronbach's alpha of 0.73<sup>5</sup>.

### *Procedure*

In collaboration with the University of Barcelona in Spain, we performed the Spanish translation process. The focus group consisted of a team of experienced researchers from different fields: psychiatry, nutrition, psychology and biomedicine.

The translation steps, which followed those described by Wild et al.<sup>10</sup>, are presented in a flowchart (figure 1). Table 1 shows MRI versions during the translation process and the final version. The MRI final version is available in supplementary material (Annex 1).

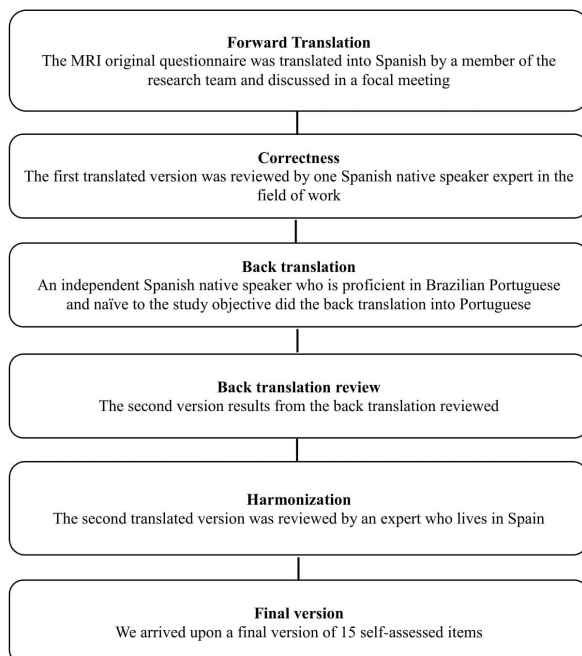


Figure 1: Flowchart of the study.

This study was conducted in accordance with the provisions of the Declaration of Helsinki<sup>11</sup> and was approved by the Research Ethics Committee of Hospital de Clínicas de Porto Alegre (approval number 15-0266 GPPG/HCPA).

## RESULTS

The main alteration in the final Spanish translation can be found in the instructions. For the Spanish MRI, in the field asking for age (“edad”), the phrase “in years” (“en años”) was added as well as the birthdate. Besides, the clause “in the absence of any events that have caused you distress” was removed.

Comparing the Brazilian Portuguese version and the back-translated version, there were no semantic differences. Only two words were adapted on items 4 and 7. There were small adjustments with synonyms, such as on question 4, in which “esteja melhor” was replaced by “é mais alta”; and on question 7, in which “aumentada” was replaced by “esteja maior”. In all questions, “na qual” was replaced by “em que”.

## DISCUSSION

The MRI, originally developed and validated in Brazilian Portuguese, is an easy and non-expensive instrument aimed to fill the gap of psychiatry research regarding mood and its circadian rhythmicity. This study accomplished all steps of the translation process and, after a few modifications, it now allows the application of the instrument to Spanish-speaking populations.

To our knowledge, concerning the instruments validated for evaluation and diagnosis of mood disorders, only one question in the Hamilton Depression Rating Scale<sup>12</sup> takes diurnal variability of sadness into account, and a higher score is applied if there is any variability in this symptom. This criterion did not consider the normal daily intra-variability of mood. An instrument assessing mood rhythmicity, such as the MRI, could be an important tool for diagnosis and evaluation of mood disorders. For instance, chronotherapeutic interventions, such as sleep deprivation<sup>13,14</sup>, light therapy<sup>15</sup> and interpersonal and social rhythm therapy<sup>16,17</sup>, have already shown effects on the improvement of mood symptoms<sup>18</sup>.

The limitation of this study is that the instrument has not been validated in a Spanish-speaking population. This process will allow a direct comparison of mood rhythms between samples from Spain and Brazil. The Spanish version of the MRI is an important tool to be employed in epidemiological studies and to compare different populations.

**Table 1:** Steps for the translation of the Mood Rhythm Instrument into the Spanish language and the final Spanish version.

	Spanish translation	Back translation	Final Spanish version
1. Existe algum horário no qual você se sente mais alerta?	¿Hay alguna hora en la que se sienta más alerta?	Existe alguma hora em que se sinta mais alerta?	¿Hay alguna hora en la que se sienta más alerta?
2. Existe algum horário no qual você se sente com mais sono?	¿Hay alguna hora en la que se sienta con más sueño?	Existe alguma hora em que se sinta com mais sono?	¿Hay alguna hora en la que se sienta con más sueño?
3. Existe algum horário no qual você se sinta com melhor capacidade para resolver problemas do dia-a-dia?	¿Hay alguna hora en la que se sienta con mejor capacidad para solucionar los problemas cotidianos?	Existe alguma hora em que se sinta com mais capacidade para solucionar os problemas cotidianos?	¿Hay alguna hora en la que se sienta con mejor capacidad para solucionar los problemas cotidianos?
4. Existe algum horário no qual a sua auto-estima esteja melhor?	¿Hay alguna hora en la que su autoestima es mejor?	Existe alguma hora em que sua autoestima é mais alta?	¿Hay alguna hora en la que su autoestima es mejor?
5. Existe algum horário em que sua concentração esteja melhor?	¿Hay alguna hora en la que su concentración es mejor?	Existe alguma hora em que sua concentração é melhor?	¿Hay alguna hora en la que su concentración es mejor?
6. Existe algum horário no qual você tenha mais apetite?	¿Hay alguna hora en la que tiene más apetito?	Existe alguma hora em que tenha mais apetite?	¿Hay alguna hora en la que tiene más apetito?
7. Existe algum horário no qual sua libido (desejo sexual) esteja aumentada?	¿Hay alguna hora en la que su libido (desejo sexual) sea mayor?	Existe alguma hora em que sua libido (desejo sexual) seja maior?	¿Hay alguna hora en la que su libido (desejo sexual) sea mayor?
8. Existe algum horário no qual você se sinta mais irritado?	¿Hay alguna hora en la que se sienta más irritable?	Existe alguma hora em que se sinta mais irritado?	¿Hay alguna hora en la que se sienta más irritable?
9. Existe algum um horário em que você se sinta mais ansioso?	¿Hay alguna hora en la que se sienta más ansioso?	Existe alguma hora em que se sinta mais ansioso?	¿Hay alguna hora en la que se sienta más ansioso?
10. Existe algum horário do dia em que você se sinta mais triste?	¿Hay alguna hora en la que se sienta más triste?	Existe alguma hora que se sinta mais triste?	¿Hay alguna hora en la que se sienta más triste?
11. Existe algum horário em que você se sinta mais disposto a realizar exercício?	¿Hay alguna hora en la que se sienta con más disposición para realizar ejercicio físico?	Existe alguma hora que se sinta com mais disposição para realizar exercício físico?	¿Hay alguna hora en la que se sienta con más disposición para realizar ejercicio físico?
12. Existe algum horário em que sua memória esteja melhor?	¿Hay alguna hora en la que su memoria es mejor?	Existe alguma hora em que sua memoria é melhor?	¿Hay alguna hora en la que su memoria es mejor?
13. Existe algum horário em que você esteja mais pessimista?	¿Hay alguna hora en la que se sienta más pesimista?	Existe alguma hora em que se sinta mais pessimista?	¿Hay alguna hora en la que se sienta más pesimista?
14. Existe algum horário preferencial para falar com amigos pessoalmente?	¿Hay alguna hora que prefiera para hablar en persona con amigos?	Existe alguma hora em que prefira para falar em pessoa com amigos?	¿Hay alguna hora que prefiera para hablar en persona con amigos?
15. Existe algum horário no qual você se sinta mais disposto?	¿Hay alguna hora en la que se sienta con mejor disposición?	Existe alguma hora em que se sinta com mais disposição?	¿Hay alguna hora en la que se sienta con mejor disposición?

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**Conflicts of interest**

The authors declare no conflicts of interest.

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Annex 1: Spanish version of the Mood Rhythm Instrument.



**INSTRUMENTO DE RITMO DE ESTADO DE HUMOR  
(MOOD RHYTHM INSTRUMENT - MRI)**

Fecha: \_\_\_/\_\_\_/\_\_\_

Sexo: ( ) Hombre ( ) Mujer Fecha de la última menstruación: \_\_\_/\_\_\_/\_\_\_

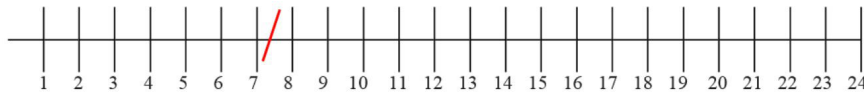
Edad (en años): \_\_\_\_\_ Fecha de nacimiento: \_\_\_/\_\_\_/\_\_\_

Enseñanza (Años completos):

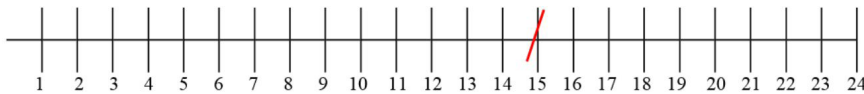
Lea atentamente las siguientes observaciones antes de contestar al cuestionario:

En cada pregunta se muestra un período de 24 horas. Cada número representa la hora del reloj. La línea entre los números representa los minutos.

Por ejemplo, (A) si marca una línea entre 7 y 8 corresponderá a las 7:30h.



(B) Si marca una línea en el 15 corresponderá a las 15:00h.

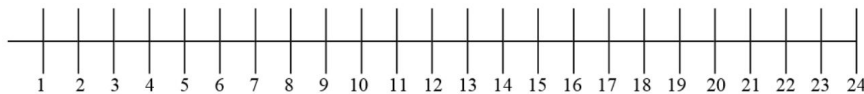


Conteste a las siguientes preguntas **considerando los últimos 15 días**, teniendo en cuenta cómo se siente la mayor parte del tiempo, casi todos los días:

1. ¿Hay alguna hora en la que se sienta más alerta?

( ) Sí ( ) No

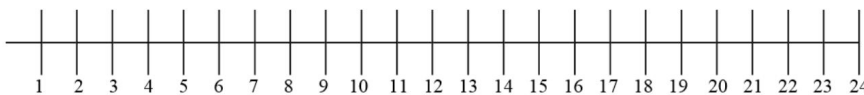
En caso afirmativo, indique la hora aproximada:



2. ¿Hay alguna hora en la que se sienta con más sueño?

( ) Sí ( ) No

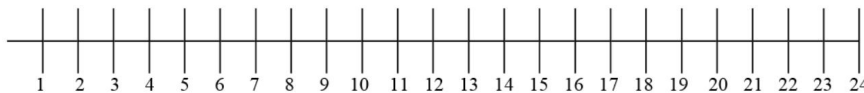
En caso afirmativo, indique la hora aproximada:



3. ¿Hay alguna hora en la que se sienta con mejor capacidad para solucionar los problemas cotidianos?

( ) Sí ( ) No

En caso afirmativo, indique la hora aproximada:

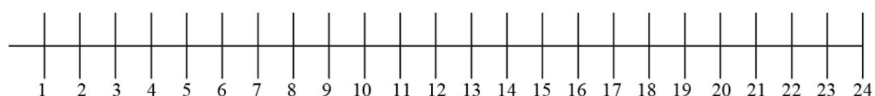




4. ¿Hay alguna hora en la que su autoestima es mejor?

Sí  No

En caso afirmativo, indique la hora aproximada:



5. ¿Hay alguna hora en la que su concentración es mejor?

Sí  No

En caso afirmativo, indique la hora aproximada:



6. ¿Hay alguna hora en la que tiene más apetito?

Sí  No

En caso afirmativo, indique la hora aproximada:



7. ¿Hay alguna hora en la que su libido (deseo sexual) sea mayor?

Sí  No

En caso afirmativo, indique la hora aproximada:



8. ¿Hay alguna hora en la que se sienta más irritable?

Sí  No

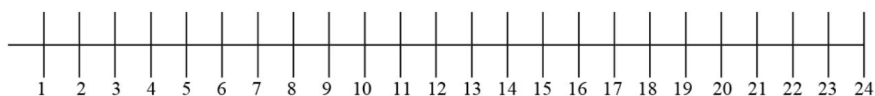
En caso afirmativo, indique la hora aproximada:



9. ¿Hay alguna hora en la que se sienta más ansioso?

Sí  No

En caso afirmativo, indique la hora aproximada:



10. ¿Hay alguna hora en la que se sienta más triste?

Sí  No

En caso afirmativo, indique la hora aproximada:



11. ¿Hay alguna hora en la que se sienta con más disposición para realizar ejercicio físico?

Sí  No

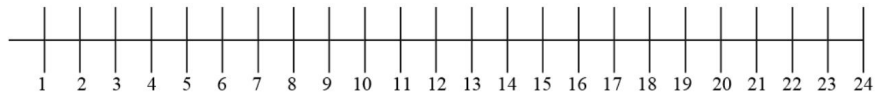
En caso afirmativo, indique la hora aproximada:



12. ¿Hay alguna hora en la que su memoria es mejor?

Sí  No

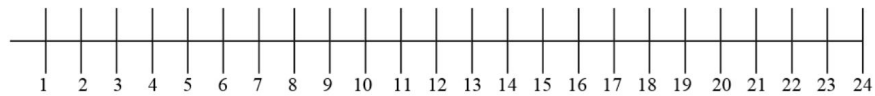
En caso afirmativo, indique la hora aproximada:



13. ¿Hay alguna hora en la que se sienta más pesimista?

Sí  No

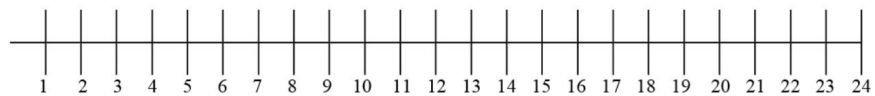
En caso afirmativo, indique la hora aproximada:



14. ¿Hay alguna hora que prefiera para hablar en persona con amigos?

Sí  No

En caso afirmativo, indique la hora aproximada:



15. ¿Hay alguna hora en la que se sienta con mejor disposición?

Sí  No

En caso afirmativo, indique la hora aproximada:

