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The Brazilian Portuguese version of the Subjective Time Questionnaire (STQ-BP): cultural adaptation and preliminary psychometric properties

A versão em português do Brasil do Subjective Time Questionnaire (STQ-BP): adaptação cultural e propriedades psicométricas preliminares

La versión en portugués brasileño del Cuestionario de Tiempo Subjetivo (STQ-BP): adaptación cultural y propiedades psicométricas preliminaries

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ABSTRACT:
Introduction: Time awareness has been associated with many relevant outcomes in Mental Health. The Subjective Time Questionnaire (STQ) is a self-report scale with 26 items that assess the subjective judgment of different time lengths. **Objective:** This study aimed to translate, adapt and validate the STQ to Brazilian Portuguese. Methods: The translation and adaptation processes followed the guidelines of the International Test Commission (ITC). Ten experts compared the first translated version with the original scale. After a review, 446 participants (66.1% women) answered the STQ. Reliability and factor structure were investigated. **Results:** The average equivalence between the experts' evaluation was 69.3%. Twenty-one items showed correlations with the total score ranging from 0.250 to 0.641. A Principal Component Analysis found 6 dimensions (eigenvalues > 1). In contrast, the Exploratory Factor Analysis showed a three-factor solution with 10 items. The Confirmatory Factor Analysis supported this structure (RMSEA = 0.049; CFI = 0.991; TLI = 0.987). The Cronbach's Alpha for the final version was 0.696 and ranged from 0.643 to 0.825 for the factors. **Conclusion:** The three-factor solution suggested an adequate model. The reliability was marginally acceptable and in

accordance with sparse previous findings. Overall, the results provided initial evidences of the validity and reliability for the STQ Brazilian Portuguese version.

Keywords: time perception, self-report, validation study, psychometrics

RESUMO:
Introdução: A percepção do tempo tem sido associada a muitos desfechos relevantes em Saúde Mental. O *Subjective Time Questionnaire* (STQ) é uma escala de autorrelato com 26 itens que avaliam o julgamento subjetivo de diferentes durações de tempo. **Objetivo:** Este estudo teve como objetivo traduzir, adaptar e validar o STQ para o português brasileiro. **Métodos:** Os processos de tradução e adaptação seguiram as orientações da *International Test Commission* (ITC). Dez especialistas compararam a primeira versão traduzida com a escala original. Após uma revisão, 446 participantes (66,1% mulheres) responderam ao STQ. A confiabilidade e a estrutura fatorial foram investigadas. **Resultados:** A equivalência média entre as avaliações dos especialistas foi de 69,3%. Vinte e um itens apresentaram correlações com o escore total variando de 0,250 a 0,641. Uma Análise de Componentes Principais encontrou 6 dimensões (autovalores > 1). Em contraste, a Análise Fatorial Exploratória mostrou uma solução de três fatores com 10 itens. A Análise Fatorial Confirmatória suportou essa estrutura (RMSEA = 0,049; CFI = 0,991; TLI = 0,987). O Alpha de Cronbach para a versão final foi de 0,696 e variou de 0,643 a 0,825 para os fatores. **Conclusão:** A solução de três fatores sugeriu um modelo adequado. A confiabilidade foi marginalmente aceitável e de acordo com achados anteriores esparsos. No geral, os resultados forneceram evidências iniciais de validade e confiabilidade para a versão em português do Brasil do STQ.

Palavras-chave: percepção do tempo, autorrelato, estudo de validação, psicometria.

RESUMEN:
Introducción: La percepción del tiempo se ha asociado con muchos resultados relevantes en Salud Mental. El Cuestionario de Tiempo Subjetivo (STQ) es una escala de autoinforme con 26 ítems que evalúan el juicio subjetivo de diferentes períodos de tiempo. **Objetivo:** Este estudio tuvo como objetivo traducir, adaptar y validar el STQ para el portugués brasileño. **Métodos**: Los procesos de traducción y adaptación siguieron los lineamientos de la International Test Commission (ITC). Diez expertos compararon la primera versión traducida con la escala original. Después

de una revisión, 446 participantes (66,1% mujeres) respondieron el STQ. Se investigaron la confiabilidad y la estructura factorial. **Resultados:** La equivalencia media entre la valoración de los expertos fue del 69,3%. Veintiún ítems mostraron correlaciones con la puntuación total que van de 0,250 a 0,641. Un análisis de componentes principales encontró 6 dimensiones (valores propios > 1). En cambio, el Análisis Factorial Exploratorio mostró una solución trifactorial con 10 ítems. El Análisis Factorial Confirmatorio apoyó esta estructura (RMSEA = 0,049; CFI = 0,991; TLI = 0,987). El Alfa de Cronbach para la versión final fue de 0,696 y varió de 0,643 a 0,825 para los factores. **Conclusión:** La solución de tres factores sugirió un modelo adecuado. La confiabilidad fue marginalmente aceptable y de acuerdo con los escasos hallazgos previos. En general, los resultados proporcionaron evidencias iniciales de validez y confiabilidad para la versión en portugués brasileño del STQ.

Palabras clave: percepción del tiempo, autoinforme, estudio de validación, psicometría.

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Introduction

Many psychological phenomena are related to the estimated duration of events, such as planning, organizing, health, and financial choices. Delaying rewards, impulsivity, and temporal discounting are also associated with time perception [1]. A decision-making style in patients with attention deficit-hyperactivity disorder (ADHD), centered on immediate rewards with no estimation of future consequences, is a well know feature called "temporal myopia" [2]. People with ADHD have shown impaired time estimation ability and a distinct sense of time passage compared to controls [3].

Sluggish cognitive tempo, a symptom cluster related to ADHD, has been associated with difficulties in time processing [4]. Patients with damage in the orbitofrontal cortex showed alterations in time perception, impulsivity, and reinforcement sensitivity. They also exhibited more negative emotions than individuals with lesions in other sites of the prefrontal cortex (e.g., dorsolateral cortex), which suggests an important covariance and maybe a common biological background, including executive functioning [5].

Time perception is a broad term related to facing time passage. However, many associated concepts need to be clarified. Time estimation is the measurement of objective time (time clock) regarding speed and accuracy; time perspective refers to the sense of past, present, and future, and time awareness encompasses the subjective judgment of time passing slowly or quickly [6].

Another important distinction is between the prospective and retrospective time perception [7]. The first notion is related to a period that is being experienced from seconds to minutes and the second is a judgment about a finished period from seconds to longer periods like hours, days, months, etc. Retrospective time perception is associated with memory capabilities, especially episodic memory. The retrospective judgments involve both short-term and long-term memories. It implies the more events have been stored in memory, the longer the time span seemed to have lasted.

There are several theoretical models based on the information-processing framework to explain prospective time perception. A prominent explanation relies on a pacemaker emitting pulses analog to an internal clock [8]. The pulses flow into an accumulator when the sustained attention is focused on time information, an "attention gate". The length of a current event is compared to previously stored estimations on the working memory

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module that retrieves information from episodic memory. Similar to other sensory modalities, some findings pointed out that time perception also follows the scalar metric property described in Weber's Law [9]. Cordes, Williams, Meck [10] proposed that time and other metrics like space, quantity, and symbolic number representation may have a shared substrate in the parietal cortex. In such view, time processing occurs in a common magnitude system.

Despite the progress in time perception research, remains unclear its specific neurobiological mechanisms. Allman et al. [9] implied structures such as motor areas (pre-supplementary, supplementary and premotor cortices), basal ganglia, prefrontal cortex, inferior olive, thalamus, and cerebellum. The authors also suggested that striatum-thalamocortical networks proceed in parallel with olivocerebellar circuits to estimate the duration of an event. These pathways may play different roles in time processing, although their interconnections let a unified sense of time passage.

Otherwise, Wittmann [7] claimed that time perception is an embodied process mediated by somatosensorial and visceral signals processed in the insular cortex. The author highlighted the compatibility of that hypothesis with the pacemaker-accumulator model because the information may be stored in the insula. Manipulations and interventions that target bodily sensations such as mindfulness produce subjective time alterations.

Wittmann et al. [11] evaluated time perception using psychophysical tasks and scales in a sample comprising experienced meditations and controls matched. Notwithstanding the absence of difference between the groups in the objective tasks, the meditators reported more time dilatation and a slower judgment of time passage.

To increase the research on time awareness, psychometric and standardized instruments are necessary. Nevertheless, many scales and questionnaires are unavailable in cultural contexts of emerging countries. The primary aim of this paper is to validate the Brazilian Portuguese version of the Subjective Time Questionnaire (STQ).

For this purpose, different psychometric evaluations were conducted, such as principal component analysis (PCA), exploratory factor analysis (EFA), confirmatory factor analysis (CFA), reliability measurements, and correlations. The authors do not a priori prediction about the factor

structure of STQ. In particular, this study set out to examine the cultural semantic equivalence of STQ versions and to provide a form of the questionnaire based on psychometric evidence.

Methods

The Subjective Time Questionnaire

Wittmann, Lehnhoff [6] created a Likert scale with two major parts to assess time awareness. The first section evaluated retrospectively the passage of pastime intervals (e.g., "How fast did the previous week pass for you?"). Answers options varied from very slowly (-2) to very fast (2).

The original authors also included two questions about the present time perception and four others related to how specific periods across life span have been passed (childhood, youth, and adulthood in different ages). The second set of questions comprises ten statements about time pressure/time compression and time expansion/time affluence (five statements each) that assess the subjective impressions of time passage.

There is a subset with three metaphors of fast time perception and the same quantity of items for time slowness. The anchors for the second part were from strong rejection (0) to strong approval (4). The values for each sentence of time pressure and time expansion were collapsed into a single index by the mean. Subsequently, many alterations have been proposed for the scale. For example, Wittmann et al. [11] included a set of items that evaluated future time intervals and a visual analog answer format. Di Giorgio et al. [12] did not include the metaphors section, and they selected specific items of the retrospective judgment of the pastime segment.

Translation procedures

The translation and cultural adaptation of STQ followed the advised procedures of best practices of the International Society for Pharmacoeconomics and Outcomes Research–ISPOR [13] and the International Test Commission (ITC) [14]. The first step was to get permission to use the scale for scientific purposes by the Ph.D. Marc Wittmann, the principal author of the questionnaire. Second, two authors (VPG and LFMD) independently translated the scale into Brazilian Portuguese. The third researcher (ALOS) established the conciliation between the versions.

This earlier version was back translated into English by a professor with a bachelor's degree in Arts and earlier experience in English-speaking

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countries. The back-translated form was sent to the original writer to determine the semantic correspondence.

In sequence, the suggestions were considered, and a preliminary version was sent to bilingual Brazilian experts in Psychology to evaluate potential linguistic biases and differences. All authorities have at least a master's degree and fluent English level. An inquiry was made in the Google Forms® with the items in Portuguese and English. There were boxes for further comments and three options of answer under their perception of linguistic correspondence: equivalent, partially equivalent, and not equivalent. Answers were evaluated, and an index was calculated by the sums of equivalence for each item and all scale. The final version was concluded and applied in a broader survey to analyze the dimensions of STQ and other relevant psychometric information.

Sample

Participants were recruited through advertisements in the researcher's social media and word of mouth. The broader survey using the STQ had the approval of the Ethics Committee of the Federal University of Minas Gerais under the number: 07570312.9.0000.5149. All participants had to read the free and informed consent term before answering the questionnaire. The eligibility criteria were age (between 18 and 65 years old) and the ability to understand all statements and instructions.

Data analysis

The Kaiser-Meyer-Olkin (KMO) indicator and Bartlett's Test of Sphericity were calculated to estimate the potential of the data to be reduced into dimensions. Principal Component Analysis (PCA) with the orthogonal rotation Varimax with Kaiser normalization was conducted to assess the underlying components of the STQ. To determine the retained number of dimensions, the Kaiser criteria was used (Eigenvalues > 1). Pearson present-moment correlations between the items and the total score were obtained with bootstrapping procedure (a thousand simulations). The Cronbach's Alpha was calculated for the full scale and its components. Items with cross-loadings and smaller correlations with the total score were excluded. The SPPS version 26 was used in those analyzes.

In line with Watkins [15], the desired value of KMO is ≥ 0.7 and Bartlett's Test of Sphericity should be significant ($p < 0.05$). The Cronbach's Alpha may be greater than 0.7 to indicates an acceptable internal consistency [16]. The same value is expected for the Composite Reliability index (CR),

although some cautions are necessary because of the influence of the number of items [17].

An Exploratory Factor Analysis (EFA) was performed in the open-source software Factor V.10.10.03 [18]. A polychoric correlation matrix was calculated with the extraction method Robust Diagonally Weighted Least Squares (RDWLS) [19]. Parallel Analysis was used to calculate the number of factors with the Varimax rotation. KMO and Bartlett's Test of Sphericity were calculated again. Model fit was evaluated with the Root Mean Square Error of Approximation (RMSEA), Standardized Root Mean Square Residual (SRMR), Comparative Fit Index (CFI), Non-Normal Fit Index (NNFI) which is equivalent to the Tucker Lewis Index (TLI), and the Chi-Squared Test.

Confirmatory Factor Analysis (CFA) was modeled in the R software [20] with the lavaan package [21]. The model was estimated using the Weighted Least Squares Mean and Variance (WLSMV) with the Satorra-Bentler correction. Model fit estimators were the Chi-Squared test, CFI, TLI, RMSEA, SRMR. The CR index was got in the calculator made by Colwell [22] for each factor as well as the complete scale.

The suggested cutoffs for absolute fit indices were: SRMR below 0.08; RMSEA under 0.06 and Chi-Squared test with $p > 0.05$ [23]. Concerning the comparative fit indices, the cutoffs were: close to or above 0.95 for CFI, NNFI, and TLI [24]. Considering the studies' sample size, the number of items, and factors of the CFA model, the adjusted cutoffs developed by the calculator with Monte Carlo simulations of Wolf, McNeish [25] based on McNeish, Wolf [26] were: SRMR below 0.048, RMSEA under 0.064 and CFI greater than 0.972.

Results

Expert panel

Ten Brazilian psychologists (7 women; 70%) were invited to investigate the semantic similarity between STQ versions. They speak fluently English and all live in Minas Gerais state. Fifty percent finished the master's degree, 20% have been doing the doctoral level and the other 30% are Ph.D. Forty percent described themselves as neuropsychologists, another 40% as clinical psychologists, 10% as a professor (undergraduate level), and 10% like a researcher of psychological assessment.

Sociodemographic data (validation sample)
The study included 446 participants (295 women; 66.1%) ranging from 18 to 63 years old (M = 34,99 years, SD = 10.7). Most of them were from the Southwest region of Brazil (71.74%). The majority was single (53.4%), with college degree (30.3%) and medium to high socioeconomic level (33.9%). In relation to previous mental health diagnoses, 51.8% of the participants denied any mental health diagnosis. The three most reported diagnoses were: ADHD (18.16%), Depressive Disorders (14.79%), and anxiety disorders (8.29%).

Expert review
The evaluation showed a general equivalence of 69.3% between the original and the translated versions. Thirty percent of the items had a partial equivalence and only 0.7% exhibited no semantic correspondence. At the item level, the smallest score of equivalence was 40%. All items that got less than 80% of equivalence were scrutinized. The suggestions of the experts were acknowledged, and the final version had done.

Item-total score correlation
As shown in Table 1, two items (19 and 24) had a not significant correlation with the total score ($p > 0.05$). Item 25 presented a small and negative correlation. Two items had a tiny and positive correlation (17 and 26). The others presented positive correlations varied from 0.250 to 0.641.
Note: C1 to C6: components of PCA.

Principal Component Analysis
The KMO for the PCA was 0.855 and Bartlett's Test of Sphericity was significant (χ^2 (325, N = 446) = 4581.39, $p < 0.001$). Both values suggested that the matrix data was suitable for PCA. The Kaiser criteria for component retention based on eigenvalues > 1 showed 6 dimensions. Figure 1 shows the scree plot for the PCA.

According to Table 2, items 2, 4, 17, 19, 25, and 26 had cross-loadings. The items with higher correlations with the total score and appropriate performance in PCA were: 3, 5, 6, 11, 12, 13, 15, 16. 18 and 20.

Figure 1: Scree plot for the PCA.

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Exploratory Factor Analysis

The KMO for the EFA was 0.761 and the Bartlett's was χ^2 (45, N = 446) = 1882.5, p < .001. Both results suggested the data's appropriateness for EFA. PA indicated 2 dimensions when the 95th percentile is considered and 3 factors when the means are contemplated. The Kaiser method based on eigenvalues pointed out 3 factors. Fit measures were: χ^2 (45, N = 446) = 3250.36, p < .001, NNFI = 0.935, CFI = 0.974, RMSEA = 0.102 and the SRMR = 0.042. RMSEA had a value higher than what is recommended and the NNFI had a borderline tolerable value. CFI and SRMR had acceptable results. The items in each factor were: 3, 5, and 6 into the first factor (F1) named as Retrospective Time Intervals; 11, 12, 13, and 15 related to Time Pressure and 16, 18, and 20 named Time Expansion.

Table 3: The rotated matrix resulted of EFA.
Note: F1: Retrospective Time Intervals; **F2:** Time Pressure; **F3:** Time Expansion. Loadings lower than 0.3 are omitted.

Confirmatory Factor Analysis

The fit measures for the CFA model were: χ^2 (45, N = 446) = 3833.4, p <.001, CFI = 0.991, TLI = 0.987, RMSEA = 0.049 (CI 90%: 0.032–0.059, p > 0.05), SRMR = 0.055. These values were appropriate when traditional cutoffs were pondered. Meanwhile, considering the dynamic cutoffs previously calculated, the SRMR is marginally above the suggestion (0.055 x 0.048).

The standardized factor loadings for each item were: 0.717 (item 3), 0.772 (item 5), 0.563 (item 6) for F1; 0.884 (item 11), 0.789 (item 12), 0.857 (item 13), 0.632 (item 15) for F2 and 0.855 (item 16), 0.7 (item 18) and 0.668 (item 20) for F3. The covariances between F1 and F2 was 0.35, F1 with F3 was 0.06 and F2 with F3 was 0.13.

Figure 2: Latent structure of STQ final version according to the CFA.

Reliability

Table 4: The Cronbach's Alpha and the Composite Reliability index (CR) for the full version of STQ, the final version and its factors.

Cronbach's Alpha for the final version is marginal also for the Restrospective Time Intervals (lower than the cutoff of 0.7). CR values were satisfactory for all measures.

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Discussion

Several limitations to the present study need to be acknowledged. First, the convenience sample was selected during the early coronavirus pandemic wave (first semester of 2020). It was possible to cause some response bias. For example, Di Giorgio et al. [12] found that Italian mothers experienced more time expansion and less time pressure during the lockdown. They changed their sleep pattern as well they felt more sadness.

In other words, the answers could be exaggerated in some way and lessened in another because of this powerful contextual stressor. Second, there are some intrinsic concerns about the representativeness of the convenience sample. The dis-balance between women and men is very pronounced (6,6 woman for 1 man). Also, there is a greater proportion of higher educated individuals compared to the Brazilian average and the authors found a geographic concentration of the sample in the Southwest region. Further research should be carried out to show the measurement invariance of STQ across such categories. Third, the EFA and the CFA were executed using the same sample, which is considered a methodological hindrance. Fourth, the estimation method WLSMV for the CFA produces an overestimation of model fit indices. To minimize this influence, the authors calculated specific interpretation parameters. Although, there is not a recommended standard procedure to solve such limitations. Fifth, there is not a complete report of the STQ factor structure in the literature. It limited the comparison of the CFA model showed here.

Overall, the experts' judgments supported the sentences' semantic equivalence. Some specific metaphors and expressions are uncommon in Portuguese, which made the translation process more complex. The PCA results showed an intricate pattern of dimensions that differs greatly from the first proposition of Wittmann, Lehnhoff [6]. The authors did not perform an EFA or a CFA, though they collapsed the values into means according to their perception of conceptual adequacy. As found in the current paper, items that represented distinct time subjective dimensions were highly correlated and items that were assumed to be associated with each other did not meet a statistical criterion of relationship. This inconsistency may be because of the multidimensionality of STQ and even the contradictory nature of its underlying constructs in terms of semantics. The relatively small correlations between item and the total score reinforced this idea.

Otherwise, the fact that the Brazilian STQ presented a different factor structure from the original one points to the possibility that the phenomenon of interest is influenced by cultural variables. Certain metaphors and concepts about the perception of time may exist in the Anglo-Saxon tradition, but may be find no correspondences in the Brazilian and Latin cultures. This hypothesis could lead to important differences in psychometric properties because of the distance between the item contents and the reality experienced by the respondents.

The findings related to the PCA and correlational analyzes resulted in a smaller set of items which could affect the constructs' representativeness. Wittmann et al. [27] reported a version of STQ with 15 items and a three-factor structure. Although, the authors did not describe this solution and the relationship with the broader version of STQ. They informed 8 items of time pressure (Cronbach's α = 0.813), 5 items of time expansion/boredom (Cronbach's α = 0.822) and 2 others associated with routines in life (Cronbach's α = 0.625). The CFA model explained 56.7% of the variance.

The present paper also found a three-factor model. However, the number of items differs from Wittmann et al. [27]: the adaptation resulted in ten items. The internal consistencies are similar to time pressure (Cronbach's α = 0.825) and a little lower for time expansion (Cronbach's α = 0.765).

The third factor found here is not equivalent to Wittmann et al. [27] because the researchers added new items related to routines not previously present in Wittmann, Lehnhoff [6]. Despite the sparse information about the psychometric properties of STQ, it is important to note that many papers used isolated items based on the study design. For example, Wittmann et al. [11] inserted items of the future time dimension. Di Giorgio et al. [12] did not include metaphors of time and selected only 13 items of the pool. Witowska et al. [28] used five questions about pastime intervals. It shows that the focus of the researches using the STQ is evaluating specific subjective time dimensions without psychometric meticulousness.

Taken as a whole, this study indicates that STQ is a valid psychometric self-report scale to measure time awareness with three crucial dimensions: time pressure, time expansion, and retrospective time intervals. Measures constructed following rigorous translation and cross-cultural adaptation steps are essential for the advancement of applied research in Neuropsychology and related disciplines. Instruments such as the STQ

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provide clinical assessment of constructs that were virtually restricted to theoretical research. Therefore, it is innovative that the STQ can be used by Brazilian clinicians, and it could be useful for developing further investigations of time perception in Brazil.

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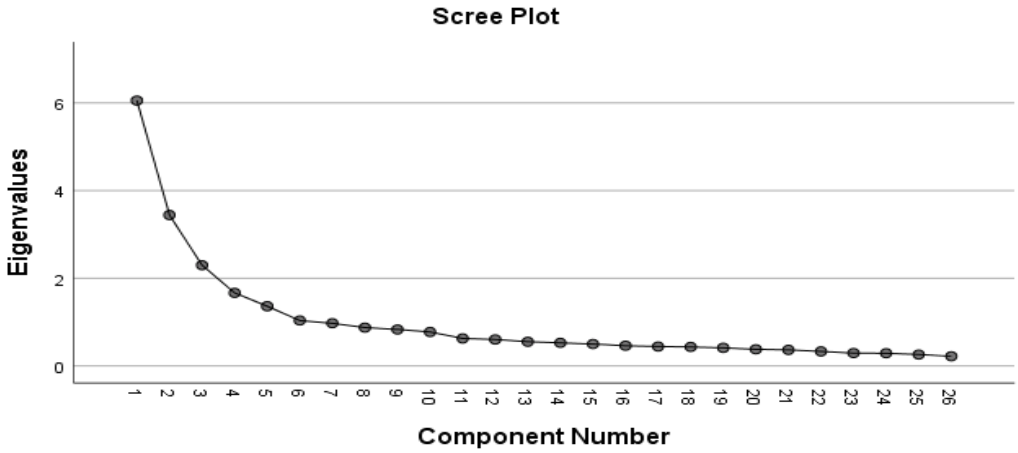

Figure 1. Scree plot for the PCA

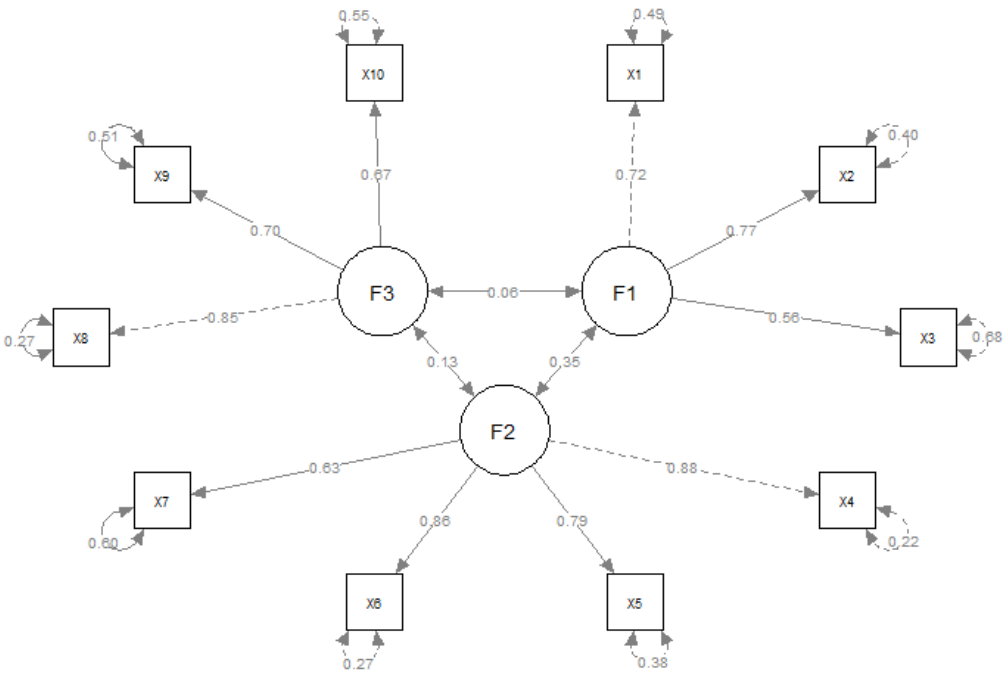

Figure 2. Latent structure of STQ final version according to the CFA

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Table 1. The rotated matrix resulted of PCA

Item	C1	C2	C3	C4	C5	C6
1	0.663					
2			0.316	0.351		
3	0.702					
4	0.717				0.325	
5	0.661					
6	0.453					
7				0.839		
8				0.779		
9					0.737	
10					0.696	
11		0.862				
12		0.712				
13		0.861				
14	0.709					
15		0.568				
16			0.821			
17	-0.393		0.497			0.385
18			0.756			
19		-0.638	0.424			
20			0.807			
21	0.758					
22	0.695					
23	0.737					
24						0.867
25	-0.51					0.405
26	-0.316		0.528			0.319

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Table 2. Item-total score correlation and experts' analyzes.

Item	Sentence (Portuguese)	Equivalent	Partially equivalent	Not equivalent	r (Bootstrapping Sample)
1	Quão rapidamente o tempo geralmente passa para você?	0.6	0.3	0.1	0.418*
2	Quão rapidamente você espera que a próxima hora passe?	0.5	0.5	0	0.250*
3	**Quão rapidamente a última semana passou para você?**	**0.4**	**0.6**	**0**	**0.467***
4	Quão rapidamente o último mês passou para você?	0.4	0.6	0	0.484*
5	**Quão rapidamente o último ano passou para você?**	**0.4**	**0.6**	**0**	**0.421***
6	**Quão rapidamente os últimos 10 anos passaram para você?**	**0.4**	**0.6**	**0**	**0.386***
7	Quão rapidamente sua infância (<12 anos) passou?	0.4	0.6	0	0.299*
8	Quão rapidamente sua adolescência (13- 19 anos) passou?	0.4	0.6	0	0.359*
9	Quão rapidamente sua vida adulta entre 20 e 29 anos passou?	0.4	0.6	0	0.423*
10	Quão rapidamente sua vida adulta entre 30 e 39 anos passou?	0.4	0.6	0	0.28*
11	**Eu não tenho tempo suficiente para completar minhas tarefas.**	**1**	**0**	**0**	**0.455***
12	**Eu frequentemente me sinto pressionado pelo tempo.**	**1**	**0**	**0**	**0.53***
13	**Eu frequentemente não tenho tempo suficiente para me dedicar a coisas importantes.**	**0.8**	**0.2**	**0**	**0.471***
14	Eu frequentemente acho que o tempo está passando rápido demais.	0.9	0.1	0	0.592*
15	**Eu preciso definir prioridades porque eu não consigo fazer todas as coisas que eu gostaria.**	**0.5**	**0.5**	**0**	**0.514***
16	**Meu tempo parece ocioso.**	**1**	**0**	**0**	**0.5***
17	Eu frequentemente penso que o tempo simplesmente não quer passar.	0.7	0.2	0.1	0.141*
18	**Eu frequentemente me sinto entediado.**	**1**	**0**	**0**	**0.456***
19	Eu tenho bastante tempo.	0.5	0.5	0	NS
20	**Eu frequentemente tenho gasto meu tempo sem fazer nada.**	**0.9**	**0.1**	**0**	**0.438***
21	O tempo é um trem bala (de alta velocidade)	0.7	0.3	0	0.641*
22	O tempo é um cavalo desembestado.	0.9	0.1	0	0.641*
23	O tempo é como uma corredeira.	0.8	0.2	0	0.638*
24	O tempo é tão vasto como o céu.	1	0	0	NS
25	O tempo é como um mar calmo, parado.	1	0	0	-0.208*
26	O tempo é como uma música monótona (tediosa).	1	0	0	0.165*
	All scale	0.693	0.3	0.007	1*

Note: ***** = significant at $p < 0.01$; **NS** = not significant ($p > 0.05$); **items in bold:** selected for EFA; **r:** Pearson Correlations

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Table 2. The rotated matrix resulted of EFA

Item	F1	F2	F3
3	0.543		
5	0.931		
6	0.500		
11		0.936	
12		0.789	
13		0.896	
15		0.661	
16			0.821
18			0.715
20			0.780

Note: F1: Retrospective Time Intervals; F2: Time Pressure; F3: Time Expansion. Loadings lower than 0.3 are omitted.

Table 3. The Cronbach's Alpha and the Composite Reliability index (CR) for the full version of STQ, the final version and its factors.

Variable	Cronbach's α	CR
Full version (26 items)	0.763	-
Final version (10 items)	0.696	0.927
Retrospective Time Intervals Factor	0.643	0.728
Time Pressure Factor	0.825	0.872
Time Expansion Factor	0.765	0.788

Cronbach's Alpha for the final version is marginal also for the Restrospective Time Intervals (lower than the cutoff of 0.7). CR values were satisfactory for all measures.

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