Bi-factor Hierarchical Model of Procrastination: Presentation and Initial Evidence of Validity

Cristiano Mauro Assis Gomes[1]
cristianomaurogomes@gmail.com

Mariana Prates Rozenberg[1]
mariana.rozenberg@gmail.com

Jhonys de Araujo[1]
jhonys.bio@gmail.com

1. Laboratory for Cognitive Architecture Mapping (LAICO). Universidade Federal de Minas Gerais (UFMG). Department of Psychology. Campus Pampulha. Av. Pres. Antônio Carlos, 6627 – Pampulha, Belo Horizonte – MG, Brazil, CEP: 31270-901.

Corresponding author: Cristiano Mauro Assis Gomes

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Abstract: The one-dimensional procrastination theory is dominant and impacts clinical practice. However, structural validity studies provide evidence that this model should be refuted. This study proposes the Bi-factor Hierarchical Model of Procrastination as an alternative. This work presents the model rationale, as well as the Procrastination Mechanisms Questionnaire, created to test the model empirically. This paper also presents initial evidence of the validity of the model, by the analysis of content validity, in which eleven raters rated the questionnaire items in terms of their targeted dimensions. The rating was reliable and consistent with the original rating by the authors in the vast majority of items. Diverging ratings were analyzed and some items were modified. The initial evidence is favorable, and future studies that investigate the internal structure of the questionnaire and its association with related constructs and clinical outcomes are essential to obtain solid evidence of the validity of the model.

KEYWORDS: stages of development; reasoning; intelligence; validity.

1. INTRODUCTION

Many variables are considered predictors of achievement. Most of them pertain to socioeconomic, cognitive and motivational domains. Examples of socioeconomic predictors of achievement are sex, type of school, and country region (Gomes, et al., 2020; Gomes & Jelihovschi, 2019; Gomes, Lemos, et al., 2020). In its turn, examples of cognitive predictors of achievement are intelligence (Golino & Gomes, 2019; Gomes, 2010a, 2011b; Gomes & Borges, 2008b, Gomes, de Araújo, et al., 2014; Gomes & Golino, 2012; Gomes & Golino, 2014; Muniz, et al., 2016), as well as, metacognition (Golino & Gomes, 2014a; Golino, Gomes, et al., 2014; Gomes & Golino, 2014; Gomes, Golino, et al., 2014). On the other hand, examples of motivational predictors are students' beliefs about the teaching-learning processes (Alves, et al., 2012; Gomes & Borges, 2008a), learning styles (Gomes, Marques, et al., 2014; Gomes & Marques, 2016), motivation for learning (Gomes & Gjikuria, 2018), and academic self-reference (Costa, et al., 2017). These domains are not isolated and students' approaches to learning, for example, is a combination between the cognitive and the motivational domains (Gomes, 2010b, 2011a, 2013; Gomes & Golino, 2012b; Gomes, et al., 2011). In sum, all these predictors presuppose an active interaction of the subject in relation to the objects of knowledge (Pereira, et al., 2019), which is corroborated by the constructivist theories (Golino, et al., 2014; Gomes, 2007; Gomes & Borges, 2009; Gomes, 2010a; Pires & Gomes, 2018), as well the neuropsychological field (Dias et al., 2015; Reppold et al., 2015).

More recently, a new variable has acquired a relevant place as a predictor of achievement: procrastination. According to the consensual definition in the literature, procrastinating is a person's behavior of postponing a task, necessarily implying negative outcomes (Klingsieck, 2013; Steel, 2007). Consequently, procrastinating is related to a decrease in perceived well-being, poorer mental health, low performance, financial hardship, and even to a higher risk of illnesses and mortality (van Eerde & Klingsieck, 2018). Considering the repercussion and impact, the negative consequences of procrastination can go beyond the individual level, affecting immediate social circles and society as a whole (e.g., increased healthcare spending, Pychyl & Flett, 2012).

If the definition of procrastination is consensual among researchers, the same cannot be said about its mechanisms. Basically, there is a central divergence between models that assume the existence of two or more mechanisms causing procrastination and models that assume the existence of a single mechanism. At the heart of this divergence are the unidimensional models of Steel (2007) and Ferrari (1992). Steel's model defines that procrastination is caused by the impulse to obtain immediate gratifications at the expense of long-term ones (Steel, 2007; 2010). In this mechanism, named irrational delay, the individual leaves a task aside, attracted to other immediately rewarding tasks. The Ferrari (1992) model, on the other hand, presupposes the existence of two mechanisms. In the first mechanism, named sensation-seeking, the person postpones a task performance as much as possible to experience a strong feeling of risk (thrill), similarly to a player who enjoys taking risks and placing the largest bet on the last move. In the second mechanism, named avoidance, the person sets a task aside in an attempt to avoid experiencing situations that threaten their self-esteem or sense of self-efficacy (Ferrari, 1992). Respectively, these mechanisms are measured by two different instruments: GPS (General Procrastination Scale) and AIP (Adult Inventory of Procrastination). In his questioning of the multidimensional model, Steel (2010) empirically analyzes the instruments GPS and AIP used by Ferrari (1992), in addition to the instrument DPQ (*Decisional Procrastination Questionnaire*), which purpose is to measure not a mechanism, but a given moment of procrastination (Ferrari, 1992; Ferrari, et al., 2009). With this analysis, Steel (2010) seeks evidence that the items in said instruments could be actually explained by a single factor, i.e., the mechanism proposed by his model (Steel, 2010). After this analysis, Steel (2010) creates his own instrument, the *Pure*

Procrastination Scale, by selecting certain items from these three instruments in order to maximize measurement in the mechanism proposed.

Currently, the literature has been focusing on investigating the one-dimensional model by Steel (2010), assessing the factorial structure of the *Pure Procrastination Scale*. These efforts are valid, since Steel (2010) did not investigate the factorial structure of the scale, and, consequently, the validity of the theoretical model. Four studies examined the factorial structure of the scale (Rebetez, et al., 2014a; Rozental et al., 2014; Svartdal et al., 2016; Svartdal & Steel, 2017) and all found unfavorable evidence of the existence of a single mechanism, thus refuting the model of Steel (2010) and indicating that procrastination would be better explained by multiple mechanisms. Furthermore, as the factorial solutions found in these studies identified different factors that represent different mechanisms, the most pressing challenge in the literature involves clearly identifying and differentiating the various mechanisms of procrastination. Svartdal (2016) started the process of identifying the mechanisms. In this article, he investigates the factorial structure of the *Pure Procrastination Scale* and reviews the results found in the studies of the French and Swedish versions of the scale (Rebetez, et al., 2014b; Rozental et al., 2014). As a result, he identifies that both the French and Swedish versions present a flawed fit in their two-factor solution, as well as Steel's (2010) one-factor solution. Svartdal (2016) and Svartdal and Steel (2017), however, find an adequate fit for the three-factor solution, corroborating the multidimensional model. Despite this, Svartdal and Steel (2017) radically change their interpretation of the GPS measurement, previously understood by them as a measure of the sensation-seeking mechanism, and come to understand it as a test that measures a moment of procrastination. The same applies to the AIP, previously conceived as a measure of the avoidance mechanism, and now also understood as a measure of a moment of procrastination. In this 2017 study, even the very definition of "irrational delay" by Steel (2010) as the procrastination caused by the mechanism of seeking instant gratification comes to be understood only as a synonym for the consensual definition of procrastination, i.e., a person's behavior to postpone a task, necessary implying negative outcomes (Svartdal & Steel, 2017). This shift in understanding and the complete elimination of the perspective of specific mechanisms are not argued by the authors, although they represent a strong reconfiguration of the challenge of the area, i.e., assessing the dimensionality of procrastination.

This divergence about the dimensionality of procrastination not only has important repercussions on the theoretical field, but it also has a considerable impact on clinical practice. This is because the dimensions indicate what is important and what should be considered in interventions concerning procrastination. This lack of theoretical-empirical clarity implies possible misguided interventions, since the identification of the causes (mechanisms) and moments allows establishing how and in what sense the intervention can lead the person to direct their cognitive, emotional and behavioral resources in order to regulate their functional fail (Rozental & Carlbring, 2014). In this context, van Eerde & Klingsieck's (2018) meta-analysis provides evidence that the clinical studies take as reference only the general definition of procrastination: the voluntary delay of tasks, leading to negative outcomes. However, it is possible that these studies implicitly consider the presence of mechanisms. For example, the study by Rozental, et al. (2017) involves self-efficacy and planning and considers both elements to be mechanisms that lead people to procrastinate (Rozental & Carlbring, 2014).

Considering the problems pointed out, this article proposes the Bi-factor Hierarchical Model of Procrastination to guide clinical practice and, at the same time, address the dimensionality of procrastination. This model theoretically defines different specific mechanisms and one general mechanism in order to explain why people procrastinate. By establishing well-defined mechanisms, the Bi-factor Hierarchical Model of Procrastination provides a roadmap of causal procrastination

agents suited for clinical intervention. This article aims to present the rationale of the theoretical model proposed, as well as initial evidence of the validity of the model, by using content validity to assess the Procrastination Mechanisms Questionnaire developed specifically for empirically testing the model.

2. Bi-factor Hierarchical Model of Procrastination: Rationale and Operational Definitions

The Bi-factor Hierarchical model of Procrastination determines that the act of procrastinating is explained by one general mechanism and by specific mechanisms. The terms hierarchical and bi-factor represent two relevant properties of the Model. There is a hierarchy between the mechanisms. The general mechanism is more comprehensive than the specific ones, as it explains all procrastination behaviors, whereas the specific mechanisms explain limited sets of these behaviors. This hierarchy is a bi-factor one, as the mechanisms are independent of each other and directly explain procrastination behaviors (see Figure 1). It is noteworthy that the bi-factor hierarchical structure is an innovation of the model, since the previous models propose a one-dimensional or multidimensional structure, with no hierarchy between dimensions.

The model assumes that the general mechanism of procrastination is a self-regulatory failure that causes individuals to inadequately manage their cognitive, behavioral and emotional resources, leading to the delay of tasks, despite the negative outcomes involved. The definition of the general mechanism as a self-regulatory failure is an innovation of the model and is conceptually plausible, as many researchers attribute a central role to self-regulation in understanding the processes that lead individuals to procrastinate, to the point that Steel (2007) pointed out procrastination as the quintessence of self-regulatory failure and the *Journal of Rational - Emotive and Cognitive - Behavior Therapy* dedicated a special edition to the theme (Pychyl & Flett, 2012).

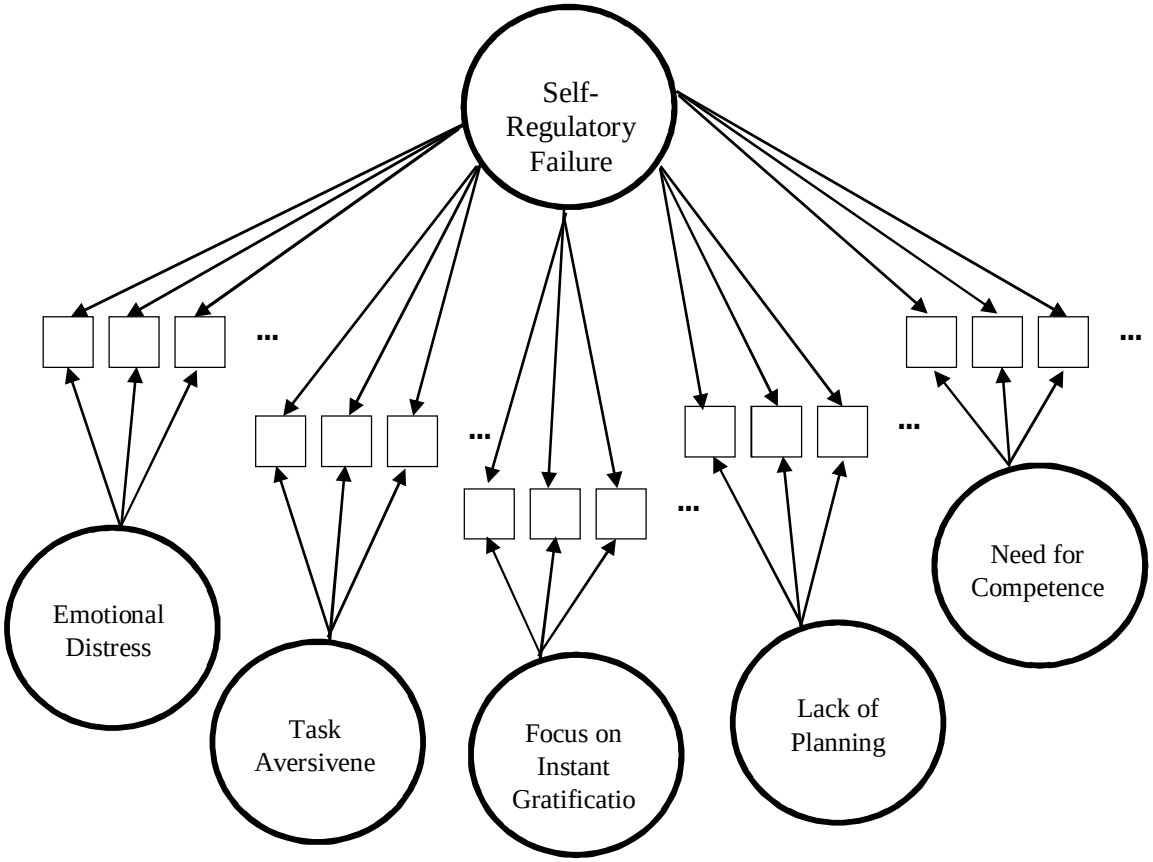
As for the specific mechanisms, the model does not intend to be exhaustive and proposes five mechanisms: Emotional Distress, Task Aversiveness, Need for Competence, Focus on Instant Gratification, and Lack of Planning, acknowledged by the literature as important predictors of procrastination (Beutel et al., 2016; Boysan & Kiral, 2017; Steel, 2007; Yu, et al., 2018). The model interprets these predictors not as variables associated with procrastination, but it understands them as causal components of procrastination itself. In addition, the choice of these mechanisms was also because of their usefulness in clinical practice.

The literature indicates that states of negative mood such as anxiety, depression, stress, guilt, and shame correlate positively with procrastination in a weak to moderate way (r = 0.20 to 0.46) (Beutel et al., 2016; Fee & Tangney, 2000; Pychyl & Flett, 2012; Pychyl & Sirois, 2016; Rozental, et al., 2017; Sirois, 2014; Spada, et al., 2006; Yerdelen, et al., 2016). The Bi-factor Hierarchical Model of Procrastination assumes that negative mood states are components of the Emotional Distress mechanism. This mechanism points out all situations in which individuals procrastinate because they are experiencing negative emotions not related to the task itself. The assumption of the model that emotional distress is a cause of procrastination finds support in the argument of Sirois (2014) and Tice, et al. (2001) that procrastination could be caused by the experience of feeling emotionally distressed, as a strategy to restore positive mood.

The literature indicates that task aversiveness is a relevant predictor of procrastination (Blunt & Pychyl, 2000; Ferrari, Johnson, & McCown, 1995; Pychyl & Sirois, 2016), which is corroborated by Steel's (2007) meta-analysis, when it identifies a moderate association between procrastinating and being averse to specific tasks (r=0.40) and averse to generic everyday tasks (r=0.40). In addition, there are arguments that allow interpreting task aversiveness as the cause of procrastination. Steel (2007) states that when an activity is considered unpleasant, individuals tend to react automatically in order to avoid it. The review of the literature on procrastination by

Rozental and Carlbring (2014) argues that the more aversive the stimulus or the situation, the higher the probability that a person will procrastinate. Therefore, the Bi-factor Hierarchical Model of Procrastination defines Task Aversiveness as a second specific mechanism. This mechanism points out to all situations where people procrastinate because they judge the task as unpleasant, implying aversiveness.

Figure 1.
Bi-factor Hierarchical Model of Procrastination.



The literature indicates that a set of variables on how people perceive and assess their ability is associated with procrastination. This set is formed by variables such as self-efficacy, self-confidence, self-esteem and fear of failure (Haghbin, et al., 2012; Klassen, et al., 2008; Steel, 2007; Wäschle, et al., 2014; Yerdelen et al., 2016). All these variables refer to the beliefs and/or expectations that individuals have about their ability to be successful or perform well (Rozental & Carlbring, 2014). Steel (2007) points to a weak association of procrastination with the variable self-efficacy ($r = -0.38$), fear of failure ($r = 0.18$) and self-esteem ($r = -0.27$). In their literature review, Rozental and Carlbring (2014) argue that believing in the ability to perform a certain task is essential for individuals to engage in the process of performing a task. Thus, the model assumes Need for Competence as a third specific mechanism of procrastination. This mechanism indicates all situations in which people procrastinate because they feel they lack the ability to complete the task.

Focus on Instant Gratification, the fourth specific mechanism of the model, indicates all situations where people postpone tasks that do not bring immediate reinforcement in order to engage in other tasks that are immediately rewarding. Rozental and Carlbring (2014, p.1489) state that instant gratification is a mechanism of procrastination, as "[...] procrastination requires an active choice between competing activities in which one is avoided in favor of the other and is usually characterized by the preference for an immediate reward [...]". This tendency to seek immediate reinforcement and defer tasks that do not provide this type of reward is associated by the literature with the variable impulsivity (Gustavson, et al., 2014; Loehlin & Martin, 2014; Rebetez, et al., 2018; Steel, 2007). The meta-analysis by Steel (2007) shows that impulsivity is one of the variables most strongly associated with procrastination (r = 0.41).

Lack of Planning, the fifth specific mechanism of the model, indicates all situations where people procrastinate because they find it difficult to plan a task. The literature points out that the difficulty of organizing and structuring tasks such as time management, priority setting, and distraction control are associated with procrastinating behaviors (Boysan & Kiral, 2017; Lyons & Rice, 2014; Pychyl & Flett, 2012; Steel, 2007; Wolters, et al., 2017). Steel (2007) states that conscientiousness is a good indicator of planning ability (organization and focus) and, among the variables analyzed in his meta-analysis, it was the one that presented the greatest association with procrastination (r = -0.62). Many interventions in procrastination assume, even implicitly, lack of planning to be a mechanism of procrastination, emphasizing actions aimed at improving time management, routine planning, and stimuli control to reduce distractions and goal setting as a therapeutic strategy (Glick & Orsillo, 2015; Häfner, et al. 2014; Rozental & Carlbring, 2014; Rozental et al., 2018; van Eerde & Klingsieck, 2018).

3. METHOD

3.1. Participants

Eleven raters took part in the process of content validity for the Procrastination Mechanisms Questionnaire, of which eight females (72.72%), aged between 28 and 38 years. They were all students taking the subject “Psychometrics” of the Psychology Graduate Program: Cognition and Behavior at the Federal University of Minas Gerais, in the year 2018, and held academic degrees (Psychology 72.72%, Pharmacy 18.18%, and Biology 9.09%).

3.2. Instrument

Procrastination Mechanisms Questionnaire

The Questionnaire is a self-report instrument, created by the authors of this article, with the purpose of empirically testing the mechanisms proposed by the Bi-factor Hierarchical Model of Procrastination. It contains 10 items that represent each specific mechanism, totaling 50 items.

The items in the Emotional Distress mechanism (items: 3, 9, 14, 21, 27, 29, 34, 36, 39, 48) represent situations in which emotional discomfort, which is not linked to the task, causes the person to procrastinate (e.g., item 3: "Even though I know I may be worse-off, I postpone a task when... I feel sad to do anything"). The items in the Task Aversiveness mechanism (items: 2, 6, 8, 15, 17, 22, 24, 31, 45, 47) represent situations in which individuals procrastinate because they judge the task aversive, whether uninteresting or unpleasant (e.g., item 2: "Even though I know I may be worse-off, I postpone a task when... it annoys me)". The items in the Need for Competence mechanism (5, 11, 13, 18, 37, 38, 41, 44, 49, 50) represent situations in which individuals procrastinate because they do not feel they have the necessary to perform the task (e.g., item 13: "Even though I know I may be worse-off, I postpone a task when... I am afraid of making mistakes"). The items in the Focus on Instant Gratification mechanism (items: 4, 7, 10, 19, 23, 28,

33, 35, 43, 46) imply situations in which the person fails to do a task in favor of another instantly rewarding task (e.g., item 4: "Even though I know I may be worse-off, I postpone a task when... I would rather be chatting with someone I like"). Finally, the items in the Lack of Planning mechanism (1, 12, 16, 20, 25, 26, 30, 32, 40, 42) express situations in which individuals procrastinate due to planning difficulties, for instance, organization, prioritization and time management (e.g., item 25: “Even though I know that I may be worse-off, I postpone a task when... I take on too many responsibilities and I cannot deliver them all”).

Each item contains a statement about procrastination and two answer options (yes or no). Respondents should answer "yes" only to items that describe behaviors they consider significant in their lives. All statements must be read in sequence to the introductory sentence "Even though I know I may be worse-off, I postpone a task when...", which is repeated throughout the questionnaire, every 10 items, to facilitate reading. The annex presents the full Questionnaire.

Each item is scored zero ("no") or one ("yes"). For each specific mechanism, scores vary between 0 and 10, while for the general mechanism, scores vary from 0 to 50. Applications can be individual or collective and tend to take approximately ten to fifteen minutes.

3.3. Data collection and analysis procedures

The raters were asked to assign a specific mechanism of the model to each item in the Questionnaire. They received a description of each mechanism and were unaware of the assignment created by the authors of the Questionnaire. The raters performed this rating in an Excel spreadsheet, in person and collectively, in the presence of the researcher.

The data were compiled in a second Excel spreadsheet for data analysis. First, the reliability of the rating was assessed by checking whether the raters rated the items in the same way. For this, Krippendorf's alpha coefficient, similar to Fleiss' Kappa, was used (Gwet, 2012). A cutoff score of 0.4 was used as the minimum value to render the rating provided by the raters reliable (Fleiss, et al., 2003). Subsequently, the content validity was evaluated for the mechanisms and items on the Procrastination Mechanisms Questionnaire, by using two analysis strategies:

1. Each specific mechanism involved 110 ratings (11 raters x 10 items), totaling 550. Missing values accounted for 2.54% (14 out of 550). The Percentage of Absolute Agreement (Matos, 2014) was calculated to indicate how much the rating by raters was identical to that of the authors, per mechanism.

2. Each item was rated 11 times (one per rater), except for the missing values. The Percentage of Absolute Agreement (Matos, 2014) was calculated to indicate how much the ratings by the raters were identical to that by the authors, per mechanism.

It was considered that each mechanism, as well as each item, had adequate content validity if at least 70% of the raters gave the same, identical rating as the authors (Stemler, 2004).

4. RESULTS AND DISCUSSION

Krippendorff's alpha of 0.675 provides evidence that the raters gave a similar rating, implying that this evaluation can be considered reliable and can be used for content validity analysis. The evidence indicates the Questionnaire delivers good content validity because all its mechanisms presented agreement above 70%, except Focus on Instant Gratification, which reached 66% of agreement, a value not too low as the cutoff point (Table 1). Valid items occurred frequently in the mechanisms of Emotional Distress, Lack of Planning and Need for Competence, majorly in Task Aversiveness and slightly in Focus on Instant Gratification (Table 1).

Table 1

Percentage of Absolute Agreement Between Raters in relation to the Authors' in the Item-Mechanism Rating

Quantity of Valid Items	Mechanism	Percentage of Absolute Agreement	Total
9	Emotional Distress	91%	83%
7	Task Aversiveness	79%	
4	Focus on Instant Gratification	66%	
10	Lack of Planning	90%	
10	Need for Competence	92%	

The items considered non-valid were inspected by the researchers in order to allow understanding whether certain characteristics in these items favored that the raters would produce a different rating from that of the authors of the questionnaire. Five of these items were modified by the researchers. Table 2 presents: (1) the non-valid items, (2) the changes made, (3) the percentage of raters whose rating converged to that of the authors of the test, (4) the presence or not of a dominant category in the rating diverging to that of the authors of the test and its percentage.

The item "...I notice that **I cannot focus** on anything" in the Emotional Distress mechanism was evaluated as representative of the Lack of Planning mechanism. It is possible that the terms in bold have originated this diverging rating. It is, however, inadequate as it confuses an internal state of lack of focus and a difficulty in organizing tasks. For that reason, the item was kept unchanged. Although this diverging rating is conceptually inadequate, it is possible that for this item the raters may have operated cognitively not as experts, but as the target audience for the test. This information is relevant for studies that seek to investigate the factorial structure of the questionnaire, in the future. For all the cases in which there is a dominant diverging rating, confirmatory models can test whether the item is explained exclusively by the mechanism rated by the authors or by the mechanism of diverging rating as well.

Table 2
Items with less than 70% of agreement

original item	**rating identical to the authors'**	**authors' rating**	**dominant diverging rating**	**modified item**
... I notice that **I cannot focus** on anything.	60%	Emotional Distress	Lack of Planning (40%)	-
... it brings up **negative feelings** in me.	64%	Task Aversiveness	Emotional Distress (36%)	... it annoys me.
... it is **very easy**.	64%		Focus on Instant Gratification (27%)	... it makes me feel discouraged.
... I feel frustrated when performing it.	36%		-	-
... I feel like doing **something more pleasing**.	64%	Focus on Instant Gratification	Task Aversiveness (27%)	-
... it takes **too long** to be finished.	36%		Task Aversiveness (64%)	... I feel like eating something good before performing it.
... there is something that interests me on TV, the smartphone, etc.	60%		-	-
...**I do not** feel **like** doing it at that moment.	44%		Task Aversiveness (33%)	...I want to do something more appealing to me, at that moment.
...I would rather chat with someone I like.	64%		-	-
...**I want to rest** and I decide to take a break.	56%		Emotional Distress (33%)	... I deserve some rest and I decide to take a break.

The item "...I feel frustrated when performing it" in the Task Aversiveness mechanism was rated quite heterogeneously by the raters, making it difficult to identify a pattern. Considering that, of the ratings produced by the raters, the most frequent was the one identical to the test authors', a choice was made towards not modifying the item. In addition, this item can be a good representative of the general Self-Regulatory Failure mechanism. In turn, the item "...it brings up **negative feelings** in me" was significantly rated by some raters as Emotional Distress. This rating is inadequate, as the statement informs that the negative internal state is produced by the task. The Emotional Distress mechanism implies that individuals procrastinate because of their internal state and this internal state, cannot be related to the task. The item was changed in order to eliminate the term "negative feelings", aiming to soften the association of this item with Emotional Distress.

Similarly to the stated in the item "...I notice that I cannot focus on anything", the possibility that this item may represent two specific mechanisms is considered. As for the item "...it is **very easy**", also in the Task Aversiveness mechanism, it was rated as Focus on Instant Gratification. The term in bold has a positive connotation and, consequently, seems to act as a trigger to link item and gratification. This rating is conceptually inadequate because a very easy task does not produce instant gratification. However, in order to disassociate terms of positive connotation from gratification, the item was modified to contain terms of negative connotation.

The influence of the connotation of terms was also present in non-valid items in the Focus on Instant Gratification mechanism. The items "... it **takes too long** to be finished" and "...**I do not feel like** doing it at that moment" were inadequately rated as Task Aversiveness, possibly because they displayed terms of negative connotation. Following the same logic as the previous amendment, the terms of connotation of said items were modified so that the connotation would be in full congruence with the mechanism. Unlike the previous two, the item "... I feel like doing **something more pleasing**" does not display explicit negative connotation terms. However, the raters may have understood the terms in bold as having an underlying negative connotation, inferring that the search for another task implies that the current task is displeasing. Considering that the diverging rating was inadequate, the item was not altered. As for the items "... there is something that interests me on TV, the smartphone, etc." and "... I would rather chat with someone I like", they did not present a dominant diverging rating and more than half the raters rated them identically to the authors. Considering these aspects, the items were not altered. Finally, the item "...**I want to rest** and decide to take a break" was rated as Emotional Distress, possibly because the term in bold was interpreted as an internal state of discomfort (tiredness) that leads to procrastination. In an attempt to eliminate this interpretation, the item was changed to "...**I deserve** to rest, and I decide to take a break" so that the verb to deserve conveys more clearly the idea of immediate gratification.

According to the raters, the sentence introducing the items was too long ("Even though I know I will probably face negative consequences, I postpone a task when...") and suggested that it be modified to "Even though I know I may be worse-off, I postpone a task when...". This suggestion was accepted by the researchers.

5. CONCLUSION

This study identified an issue not addressed by the procrastination research area: The one-dimensional procrastination theory is dominant and strongly influences the entire field of procrastination, even though all construct validity studies present evidence that this model should be refuted. Clinical practice refers to this model to theoretically support its interventions, but its strategies of action and assessment are based on specific mechanisms that presuppose an implicit model of multidimensionality. In addition to pointing out an issue unnoticed by the field, this study also innovates by proposing a new theoretical model, the Bi-factor Hierarchical Model of Procrastination, more empirically plausible and more congruent with clinical practice. To test it empirically, the Procrastination Mechanisms Questionnaire was created.

The new model offers the field an alternative to the dominant model, creating space for new theoretical discussions and empirical studies on the dimensions that make up procrastination. In addition, it encourages the clinical field to explicitly state the specific mechanisms present in its interventions, and it can also help clinicians direct their strategies, by making these potentially more effective.

The model proposed is not an antagonist to the dominant model. It recognizes the existence of a general mechanism, which is in consonance with the dominant model perspective that procrastination is mobilized by a general factor. Nevertheless, the model also recognizes the

presence of specific mechanisms, taking as a reference clinical practice, theoretical arguments and studies on predictors of procrastination.

Empirical evidence favorable to the model was found. More than 80% of the items (41 out of 50) evidenced content validity. In addition, seven of the nine non-valid items were given identical ratings to that of the test authors by more than half the raters. The vast majority of the non-valid items presented a dominant diverging rating that competed with the rating by the authors. However, only one of these items presented a dominant diverging rating more frequently than the original rating. The presence of a dominant diverging rating pointed out to the possibility that some items also represented a second specific mechanism. This information is important for future modeling in studies on the structural validity of the Questionnaire. In total, five items were modified as to minimize the dominant diverging rating.

Despite the favorable evidence, this article is only the first piece of several pieces of evidence required to obtain more solid evidence on the validity of the proposed model. It is imperative to conduct future studies that investigate both the internal structure of the Questionnaire and its external validity, by means of analyses that inspect its association with conceptually related constructs and its ability to predict clinical outcomes.

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