Adaptation of the Teacher Emotions Scales (TES) to the Brazilian context

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Abstract

Emotions are complex psychobiological reactions, articulating motivational patterns, an impulse for action, and physiological changes. The aim was to adapt and validate a self-report instrument for the assessment of teachers' emotions in a Brazilian context. We propose the adaptation of the Teacher Emotions Scales (TES) – developed in German and translated to English –, which assesses teachers' enjoyment, anger, and anxiety. Eight specialists translated and back-translated the scale in and from both English and German. Participants were 410 teachers and professors, who also answered the Affect Scale (AS) and the Work Burnout Inventory (WBI). Exploratory factorial analysis found three factors (enjoyment, ω = .88, anxiety, ω = .67, and anger, ω = .81), as in the original scale. We also found meaningful correlations between the dimensions of the scales and the AS and WBI subscales. Adapting this scale will contribute to current research on teacher emotions in Brazil. *Keywords:* emotions at work; transcultural adaptation; Teacher Emotions Scales.

Adaptação da Teacher Emotions Scale (TES) ao Contexto Brasileiro

Resumo

As emoções são reações psicobiológicas complexas, articulando padrões motivacionais, impulso de ação e mudanças fisiológicas. O objetivo foi validar um instrumento de autorrelato para avaliação das emoções de professores em um contexto brasileiro. Propõe-se a adaptação da Escala de Emoções do Professor (TES) - desenvolvido em alemão e traduzido para o inglês -, que avalia o prazer, a raiva e a ansiedade dos professores. Oito especialistas traduziram e retraduziram a escala de e para inglês e alemão. Os participantes foram 410 professores, que também responderam à Escala de Afeto (AS) e ao *Work Burnout Inventory* (WBI). A análise fatorial exploratória encontrou três fatores (prazer, $\alpha = 0.88$, ansiedade, $\alpha = 0.67$ e raiva, $\alpha = 0.81$), como na escala original e correlações significativas entre as dimensões das escalas e as subescalas AS e WBI. A adaptação dessa escala contribuirá para as pesquisas atuais sobre as emoções dos professores no Brasil.

Palavras-chave: emoções no trabalho; adaptação transcultural; teacher emotions scales.

Adaptación de la Teacher Emotions Scale (TES) al contexto brasileño

Resumen

Las emociones son reacciones psicobiológicas complejas, que articulan patrones motivacionales, impulsos de acción y cambios fisiológicos. El objetivo fue validar un instrumento de autoinforme para la evaluación de las emociones de los docentes para el contexto brasileño - la Escala de Emociones de los Docentes (TES), desarrollada en alemán y traducida al inglés, que evalúa el placer, la ira y la ansiedad de los profesores. Los participantes fueron 410 docentes, quienes también respondieron a la Escala de Afecto (AS) y el Inventario de *Burnout* en el Trabajo (WBI). El análisis factorial exploratorio encontró tres factores (placer, $\alpha = 0.88$, ansiedad, $\alpha = 0.67$ e ira, $\alpha = 0.81$), como en la escala original. También se encontraron correlaciones significativas entre las dimensiones de las escalas y las subescalas AS y WBI. La adaptación de esta escala contribuirá a la investigación actual sobre las emociones de los profesores en Brasil.

Palabras clave: emociones en el trabajo; adaptación transcultural; Teacher Emotions Scales.

Emotions can influence work relationships and performance in different ways (Bonfim & Gondim, 2010). With the growth of the service sector and thus its increased demands, studying workplace emotions has

gained momentum, since activities in this area demand expressing specific emotions as well as suppressing others, to comply with the behavioral standards expected at work (Beal et al., 2013).



Interest in this topic has also increased partially due to the popularity of the topic of emotional intelligence on organizational work and research. However, beyond emotional intelligence, there is still a lot to be studied regarding emotions in organizational and work contexts. One of the first elements to consider is the context of the work however the personal characteristic associated in this can result in individual emotional experiences negative or positive. Those emotions, in turn, will have an impact on employees' satisfaction and commitment, as well as on behaviors based on judgment and affect (Ashkanasy & Daus, 2001) or how you need to conform to organization expectations (Thwaites, 2017).

Although these issues may affect any type of work, teaching has been considered a profession that often demands the expression of certain emotions and triggers different emotions in these workers (Frenzel et al., 2016). In addition, the emotions of the teachers seem to imply variables that are directly related to teaching strategy (Chen, 2019) and socioemotional skills of the students as a self-regulation to learn (Cambron, et al., 2017) and student motivation and these, in turn, time, in academic performance (Frenzel et al., 2016; Frenzel et al., 2019; Keller et al., 2016) as well as the high quality of teacher-student relationships (Frenzel et al., 2021; Jacob et al., 2017). Therefore, measuring emotions in this work context is extremely relevant. As indicated in previous research (Chen, 2019), it is necessary that new methods are created so that one can understand more about the emotions of the teachers because the existing literature is insufficient considering the demand and need. This depends mostly on transversal projects and data from self-report instruments. Thus, the objective of the current paper was to adapt the Teacher Emotions Scales originally developed by Frenzel et al. (2016) to the Brazilian context and find evidence of its validity with teachers from different levels of education.

Although different psychophysiological states can be clearly identified as emotions – such as fear, anger, and sadness – and others are not classified as emotions – such as hunger and thirst – (Smith & Lazarus, 1990), to date there is no full scientific consensus on the definition of the term emotions (Ashkanasy & Dorris, 2017). One possible definition, which we also adopt in the present contribution, is that emotions are complex psychobiological reactions, which articulate motivational patterns, impulse to action, and physiological changes, indicating that the interaction between organism and its environment may risk its wellbeing. This reaction is

related to the evaluation individuals make of the environment and may be anticipated solely by imagining a situation (Smith & Lazarus, 1990). Thus, emotions provide the motivation to act when facing a situation, but this action may occur as different behaviors, depending on the context (Mesquita et al., 2012).

Emotions may be understood as a trait or state. As traits, they are patterns or a tendency for individuals to experience positive or negative affects throughout their experiences. As states, emotions are induced by specific contexts and transient. Although these categories are different, they are intimately related, and traits influence states (Barsade et al., 2003). Thus, emotions as states can be measured by asking an individual how they feel in a specific moment, while emotions as traits can be studied with instruments that evaluate how they usually feel. In following the original teacher emotion instrument authors' rationale (Frenzel et al., 2016), we take a trait approach to measuring emotions in the present contribution.

The concept of emotions is based on multiple theories. The theory of basic or discrete emotions assumes that there are different, clearly separated, categories of emotions, which produce physiological responses as well as specific patterns of expression and distinct semantic fields (Scherer, 2013). This theory is opposed to authors proposing a dimensional approach, in which affect is continuous and distinct in terms of valence (pleasant/unpleasant) and arousal (calm/excited). According to this approach, emotions are a combination of different levels of pleasantness/unpleasantness and of arousal (Izard, 2009).

According to the discrete emotions approach, joy is an emotion characterized by high subjective pleasure, approximation motivational tendencies, and open gestures and facial expressions. Anger and anxiety, although negative valence and characterized as unpleasant, have completely different characteristics. Anger is related to fighting motivational tendencies and aggressive gestures and facial expressions, while anxiety is related to avoidance and defensive gestures and facial expressions (Frenzel et al., 2016).

Felt emotions and their behaviors are related to the individual's current context as well as their appraisal of the situation. Appraisal theory postulates that a stimulus will activate emotions if it has significance to that individual. Thus, emotion is derived from meaning, which in turn is associated to the individual's evaluation, or appraisal, so that different people may experience different emotions in the same situation. Emotions emerge

according to an event's importance for an individual's goals, concerns, and motivations. Moreover, an individual's appraisal regarding the person responsible for the situation may also influence which emotion will be felt (Manstead, 2010). Although some emotions are triggered by situations that do not involve any social interaction (e.g., fear of heights), others occur in social environments or only in the real or imagined presence of other people (e.g., shame or embarrassment). Thus, social situations are potential emotional triggers (Manstead, 2010).

The professions that have been studied regarding emotions include, less specialized work, such as clerkship, as well as more specialized work, such as those related to health and education (Hochschild, 1983; Wharton, 2009). Teaching is a profession that has gained some attention from researchers (e.g., Iriarte Redín & Erro-Garcés, 2020; Taxer & Frenzel, 2020); however, regarding emotions, the recurring theme is burnout, while the emotional experiences of these professionals have received relatively little attention. Although burnout syndrome is strongly associated with emotional experience (Chang, 2009), these types of studies cannot comprise the diversity of emotions experienced by teachers, since burnout is a possible consequence of the vast range of emotions a teacher feels. Additionally, a large portion of existing studies are qualitative, thus scales that quantitatively measure these emotions are still scarce (Frenzel et al., 2016) albeit necessary.

A literature search of scales for emotions in the workplace published in papers in Brazil found some related to jobs in general. The scales are the Work Affects Scale (*Escala de Afetos no Trabalho*, ESAFE) (Ferreira et al., 2008), the Job-Related Affective Well-Being Scale (JAWS) Brazilian Version (Gouveia et al., 2008), the Work Well-Being Scale (*Escala de Bem-Estar no Trabalho*, EBET) (Paschoal & Tamayo, 2008), and the Joy at Work Scale Brazilian Version (Cruz et al., 2020). However, none of these scales encompass emotions in teachers, only work environments in general. Additionally, these scales do not refer to specific situations, only to work in general, besides mostly being composed of words instead of full phrases.

While searching for emotion scales that are specific to the teaching context, we found international instruments. They are the Affect-as-Teacher and Affect-during-Teaching scales (Moè et al., 2010), Teacher Emotion Inventory (TEI) (Chen, 2016), Emotions in Teaching Inventory (ETI) (Trigwell, 2012), Teacher Emotions Scales (TES) (Frenzel et al., 2016), Teacher Emotion Questionnaire (TWQ) (Burić, Slišković, &

Macuka, 2018), Teacher Emotional Labor Strategy Scale (TELSS) (Yin et al., 2013), as well as single item scales (e.g., Goetz et al., 2015) or measures in which the student evaluates the teacher's emotions (e.g., Assor et al., 2005).

In the current study, we chose to adapt the Teacher Emotions Scales (TES), general version, since this scale has shown appropriate psychometric properties and the scale's authors recommend adaptations for new contexts and nationalities. Beyond there are no measures of this construct in Brazil. Moreover, emotions measured by this scale are among the most reported in teaching, and have marked conceptual differences (Frenzel et al., 2016; Lohbeck et al., 2018). Although the scale was developed for teachers in primary education, we chose to explore it additionally for the higher education context in Brazil. Thus, the adaptation of the TES to various Brazilian teaching contexts was the key.

Method

Participants

Participants were 410 teachers (77.07% female) aged 18 to 71 years (M = 40.82 years; SD = 10.21), of whom 45.6% taught at higher education contexts and 33.4% at primary and secondary education contexts. A total of 34.3% worked in more than one educational level, being that 18.78% worked in undergraduate and graduate education, 9.76% worked in secondary and high school education, and 4.88% worked in undergraduate and high school education. 63.9% worked in public and 42.7% in private institutions. Their working experience was on average 13.1 years (SD = 9.6; min less than 1 year, max 44 years). The average weekly workload, spent only in the classroom, was 24.9 hours (SD = 14.3). The higher weekly workload was of primary teachers (M = 32.49 hours; SD = 13.75) and the lower was of higher education professors (M = 19hours; SD = 12.75). Most participants lived in Brazil's Federal District (33.9%) at the time of the data assessment, followed by the states of Sao Paulo (24.1%) and Minas Gerais (7.3%). Most respondents had a specialization degree (44.9%), followed by Master's (27.8%) and PhD (24.4%). Over 55% taught more than one shift, 64.8% taught mornings and 58.0% taught afternoons. Participants taught mainly courses in the social and human sciences (74.9%), while 20% taught courses in more than one content area.

Instruments

We used the general version of the Teacher Emotions Scales (TES) in the Portuguese language, which

evaluates teachers' global emotions regarding their work. It was originally developed in German by Frenzel et al. (2016). The authors adapted this version into English and both versions were used in our adaptation to Portuguese. The instrument has 12 items that measure teachers' joy, anger, and anxiety, each factor is composed of four items. The original validation study used confirmatory factorial analyses to identify the pertinence of the three-factor structure (joy, anger, and anxiety) over one factor (emotions) and two factor (positive and negative emotions) structures.

A four-point Likert scale, from "strongly disagree" to "strongly agree", was used for responses. The German sample, composed of 414 teachers, found alphas between .70 (anxiety) and .77 (joy) in the general scale. The Canadian sample, with 377 teachers, found alphas varied between .73 (joy) and .81 (anxiety). The Portuguese version has 13 items (Annex 1).

We explored the external validity of the TES by applying an Affect Scale (AS), proposed by Zanon et al. (2013). This scale is composed of 20 items, half of which are for the positive affects factor (α = .83) and the other half for negative affects (α = .77). Items are responded using a five-point scale; the closer to five, the more that item is descriptive of the participant. Examples of positive and negative affect items, respectively, are: "I am brave when I face a challenge" (in Portuguese, "Sou valente quando eston diante de um desafio") and "I get easily annoyed" ("Eu me irrito facilmente"). The study found that alpha values were α = .86 for positive affects and α = .83 for negative affects.

We also used the Work Burnout Inventory (WBI) (in Portuguese, *Inventário de Burnout no Trabalho, IBT*) (Damásio & Borsa, in preparation). This instrument is composed of 25 items evaluating three dimensions of burnout: emotional exhaustion (9 items), depersonalization (8 items), and low professional accomplishment (8 items). The study found $\alpha = .91$ for emotional exhaustion, $\alpha = .88$ for depersonalization, and $\alpha = .87$ for low professional accomplishment. Responses were in a five-point Likert scale varying from "totally disagree" to "totally agree". These instruments were chosen because they are related to those used by Frenzel et al. (2016) in their process of validating the German and English versions of TES.

Procedure

Firstly, we requested authorization of the first author of the TES. After obtaining approval, we sent the instruments and consent forms in German and English to four bilingual specialists (two for German and two for English). Next, the translated versions were evaluated by a committee composed of three Brazilian graduate students and consolidated into a unified version. Only four items were modified to better represent the Brazil culture. This version was then sent to four translators for a back translation from Portuguese to English and to German, which were also analyzed by a committee. We followed the recommendations by Borsa et al. (2012), the International Test Commission (ITC, 2016).

The final version after the committee and the back translations to English and German were sent to the first author of the original TES for acknowledgment and approval, together with some considerations regarding the process. The author suggested changes in some items (for example, substituting "De modo geral, ensinar me dá satisfação" for "Em geral, ensinar me deixa feliz") and including one more item for the joy factor, to test the best wording for an item on enthusiasm (see Annex 1).

The research items were made available using Google Forms and shared on social media such as WhatsApp and Facebook. We shared the link with teachers from different education levels and any person with access to the link could fill out the form; however, the instructions specified that to participate one had to be a teacher. We asked respondents to share the instrument in their social media to reach as many participants as possible, also known as the snowball method. Initially, participants were shown the informed consent form and had to mark that they agreed to proceed and access the instruments. The link was available for one week.

Data Analysis

To test the internal structure of the instrument, we conducted an exploratory factor analysis using the Factor software, version 10.10.03. Procedure for determining the number of dimensions was Optimal Implementation of Parallel Analysis with polychoric correlations and oblique rotation (Promin). The analysis was implemented using the Robust Diagonally Weighted Least Squares (RDWLS) estimation method, suitable for categorical data (Li, 2016). The adjustment indices used were: Comparative Fit Index (CFI); Tucker-Lewis Index (TLI); Root Mean Square Error of Approximation (RMSEA); and Goodness of Fit Index (GFI). Values of CFI, TLI and GFI values must be> than .90 and, preferably, above .95; RMSEA values

should be < .08 or, preferably < .06, with a confidence interval (upper limit) < .10 (Brown, 2015). The stability of the factors was assessed using the H index (Ferrando & Lorenzo-Seva, 2018). The H index assesses how well a set of items represents a common factor. H values range from 0 to 1. High H values (> .80) suggest a well-defined latent variable, which is more likely to be stable in different studies. Low H values suggest an ill-defined latent variable, and probably unstable between different studies. The reliability of the measure was measured through coefficient MacDonald's omega (ω) (Dunn et al., 2014).

Results

The data's KMO of .90 and Bartlett = 2466.9 (df = 78; p = .000010) indicated matrix factorability. The adjustment indices indicated (CFI) = .993; (TLI) = .986; (RMSEA) = .063 (95% CI: .044 – .073); and (GFI) = 1.000. We also calculated reliability of the instrument using MacDonald's omega (w). Table 1 shows the matrix structure.

All correlations found between factors were significant (p < .01), as shown in Table 2. Regarding associations between factors of the different scales, the

strongest correlations were between joy in TES and low professional accomplishment in WBI, between anger in TES and low professional accomplishment in WBI, and between depersonalization in WBI and negative affect in AS.

Discussion

The adapted TES went through translation, consolidation of the translation, back translation, consolidation of the back translation, and considerations by the scale's author, following recommendations by the ITC (2016) and by authors who proposed adaptation processes based on the recommendations, such as Borsa et al. (2012). During the process, we observed differences between the German and English translations. When this occurred, we opted for the German version, but conducted a cultural adaptation as well as the translation. This adaptation is relevant in maintaining semantic equivalence between the different versions of the scale (Borsa et al., 2012). Thus, together with the committees, we implemented considerations from the author of the scale, after discussing how some words in the scale were used in the German and the Brazilian contexts.

Table 1. Factor Loading of TES

Items	Anger	Anxiety	Joy
Frequentemente, eu tenho razões para me irritar enquanto ensino.	1.042	.011	.162
Frequentemente, eu me sinto aborrecido enquanto ensino.	.788	011	119
Às vezes eu fico realmente furioso enquanto ensino.	.684	02	078
Eu me sinto apreensivo quando penso em ensinar.	118	.789	161
De modo geral, eu me sinto tenso e nervoso enquanto ensino.	.038	.548	319
A preparação das aulas frequentemente me causa preocupação.	106	.761	.178
Frequentemente, eu me preocupo que minhas aulas não estejam indo tão bem.	.121	.417	.084
Frequentemente, eu tenho razões para me alegrar enquanto ensino.	023	.053	.846
De modo geral, ensinar me frustra.	.163	.024	645
De modo geral, ensinar me deixa feliz:	.11	.072	1.046
De modo geral, eu me sinto entusiasmado enquanto ensino.	.024	.012	.93
De modo geral, eu me divirto tanto ensinando que preparo e ministro minhas aulas com prazer.	.011	14	.706
De modo geral, eu ensino com entusiasmo.	.001	.026	.903
H Latent	.941	.835	.959
H Observed	.887	.789	.887

Note. Factor loadings above .40 are in bold

Table 2.

Descriptive Statistics and Factor Correlations

Factors	MacDonald's omega (w)	1	2	3	4	5	6	7
TES – Anxiety	.81							
TES – Joy	.69	52						
TES – Anger	.88	0.44	54					
IBT – Emotional Exhaustion	.91	0.46	54	0.57				
IBT – Depersonalization	.88	0.41	49	0.52	0.68			
IBT – Low Professional Accomplishment	.88	0.47	66	0.59	0.80	0.68		
AS – Positive Affects	.88	34	0.52	30	42	37	46	
AS – Negative Affects	.84	0.45	31	0.45	0.63	0.59	0.54	34

Correlations are significant (p < .01)

To verify the scale's factorial scale, we opted for an exploratory factor analysis since one item was added. Results indicated that a three-factor structure was pertinent, in accordance with Frenzel et al. (2016). However, the item "De modo geral, ensinar me frustra" ("Teaching generally frustrates me"), which was originally considered an anger factor, was considered as part of the joy factor with inverted factor loading in the Brazilian version. This difference may be related to cultural issues or to the fact that only primary education teachers participated in the German and English validation, while the Brazilian sample included teachers from different educational levels.

To verify the scale's external validity, we conducted correlation analyses with the affect and burnout scales. The positive affect factor from EA was positively correlated with the joy factor of the TES and negatively correlated with the anxiety and anger factors. The reverse correlations occurred between the negative affect factor and the TES factors. These results were expected based on evidence from Frenzel et al. (2016) and the reasoning that affects are both traits and states; and affects as traits are related to affects as states. Thus, people with more positive affect experiences generally present positive affects in specific situations and contexts (Barsade et al., 2003; Peláez-Fernández et al., 2021), such as their workplace.

The factors in TES were also significantly correlated with the WBI factors and the strongest was between joy and low professional accomplishment. This relationship was negative, indicating that professors experiencing greater joy also experience greater professional accomplishment. The anxiety and anger factors were positively correlated with all the dimensions of burnout, indicating that, the more negative emotions a teacher experiences, the higher the probability of developing this syndrome or one of its dimensions. These results are in accordance with Chang's (2009) suggestion that, according to appraisal theory, teachers' evaluation of their own work experiences affects their felt emotions (for example, discrete emotions, such as anger and anxiety) and that, in turn, these emotions are related to burnout, since they demand that teachers use their emotional resources.

The negative relationship was stronger between positive emotions and low professional accomplishment, which is in accordance with findings from the validation by Frenzel et al. (2016). Moreover, the authors found significant correlations between the three emotional factors and the three burnout dimensions in the same directions found in our current study. Another aspect to consider pertains to the fact that the frustration item is grouped with the joy factor with negative factor loading. This grouping seems to indicate that higher levels of joy are associated to less frustration while teaching. However, we recommend new studies to investigate this association between items.

Considering our results, we expect that adapting the TES will contribute to Brazilian research on teachers' emotions, since we could not find scales that were specific for a teaching context. Although there are affect scales, and affect in the workplace scales, we consider the work of a teacher to have specificities that justify creating or adapting a scale for this group. Thus, we expect the scale to become an option when researching this phenomenon in the Brazilian context, so we may further investigate teachers' emotions and their association with other constructs related to the health of this professional and their impact on the learning-teaching process.

Applying the scale to college professors was another contribution from our study, since it was originally developed for primary education teachers and had only been tested with this category. We believe this scale is also relevant for the higher teaching. However, future studies should compare the factorial structures found in college professors and primary and secundary education teachers to confirm the usefulness of the scale for different groups of teachers. Finally, we also recommend applying this scale to larger, more diverse, samples, in different contexts. For example, other Brazilian cities and states, since we used a convenience sample composed mainly of residents of Brazil's Federal District. Further, we recommend including a broader range of emotions that are experienced by this professional category.

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Annex 1. Brazilian Version of the Teacher Emotions Scales

Escala de Emoções do Professor

A seguir você encontra uma lista de afirmações que descrevem suas experiências como professor(a). Por favor indique sua reação pessoal a cada uma dessas afirmações, circulando o número que melhor representa a sua resposta. [Translation: You will see below a list of statements describing your experience as a teacher. Please indicate your personal reaction to each statement, by circling the number that is most representative of your answer.]

Item	1 – Discordo fortemente [Strongly disagree]	2 – Discordo [Disagree]	3 - Concordo [Agree]	4 - Concordo fortemente [Strongly agree]
De modo geral, ensinar me deixa feliz. [I generally enjoy teaching.]	1	2	3	4
De modo geral, eu me divirto tanto ensinando que preparo e ministro minhas aulas com prazer.	1	2	3	4
[I generally have so much fun teaching that I gladly prepare and teach my lessons.]				
Frequentemente, eu tenho razões para me alegrar enquanto ensino.	1	2	3	4
[I often have reasons to be happy while I teach.] De modo geral, eu ensino com entusiasmo. [I generally teach with enthusiasm.]	1	2	3	4
De modo geral, eu me sinto entusiasmado enquanto ensino. [New item, I generally feel enthusiastic about teaching]	1	2	3	4
Frequentemente, eu tenho razões para me irritar enquanto ensino.	1	2	3	4
[I often have reasons to be angry while I teach.] Frequentemente, eu me sinto aborrecido enquanto ensino. [I often feel annoyed while teaching.]	1	2	3	4
Às vezes eu fico realmente furioso enquanto ensino. [Sometimes I get really mad while I teach.]	1	2	3	4
De modo geral, ensinar me frustra. [Teaching generally frustrates me.]	1	2	3	4
De modo geral, eu me sinto tenso e nervoso enquanto ensino. [I generally feel tense and nervous while teaching.]	1	2	3	4
Frequentemente, eu me preocupo que minhas aulas não estejam indo tão bem.	1	2	3	4
[I am often worried that my teaching isn't going so well.]				
A preparação das aulas frequentemente me causa preocupação. [Preparing to teach often causes me to worry.]	1	2	3	4
Eu me sinto apreensivo quando penso em ensinar. [I feel uneasy when I think about teaching.]	1	2	3	4

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